



Presented by Daniel Leung, IBM Solution Architect
Energy Institute Seminar - Nov 24, 2010

Let's Build a Smarter Planet: A Smart Building is a Green Building





The Bad News: **IT accounts for 2% of global CO₂ emissions**

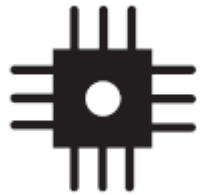


The Good News: **IT can significantly contribute to control and reduce the 98% of CO₂ emissions caused by other activities and industries**

“... you can’t make a product greener, whether it’s a car, a refrigerator or a traffic system, without making it smarter — smarter materials, smarter software or smarter design.” - Thomas L. Friedman

Sources: Gartner, *Green IT*, October 12, 2007; “The Green Road Less Traveled” by Thomas L. Friedman, *The New York Times*, July 15, 2007, <http://select.nytimes.com/2007/07/15/opinion/15friedman.html?scp=2&sq=thomas%20%20friedman%20july%202007%20greener%20smarter&st=cse>

What makes something *SMART*?



INSTRUMENTED



INTERCONNECTED



INTELLIGENT



SMARTER



Smarter Buildings applications and benefit examples.



SMART IS



Integrated communications and building services that enhanced guest experience.



The Dragon (Hangzhou):

Designed and built advanced IT systems, such as HSIA, VoD, RFID, Self-Service Kiosk, IPT, IBMS and Cloud Computing thereby provided enhanced in-room experience to guest and improved operation efficiency.

SMART IS



Holistic energy mgmt that enhances the efficiency of buildings and other assets.



St. Regis Hotel (Shanghai):

Designed for 4.9% energy cost to revenue compared to average for 5 star hotels average at 8%. Reduced energy cost / revenue 40% vs. similar 5 Star hotels.

SMART IS



Integration of financial, rental income projection and corporate budgeting to increase earnings.

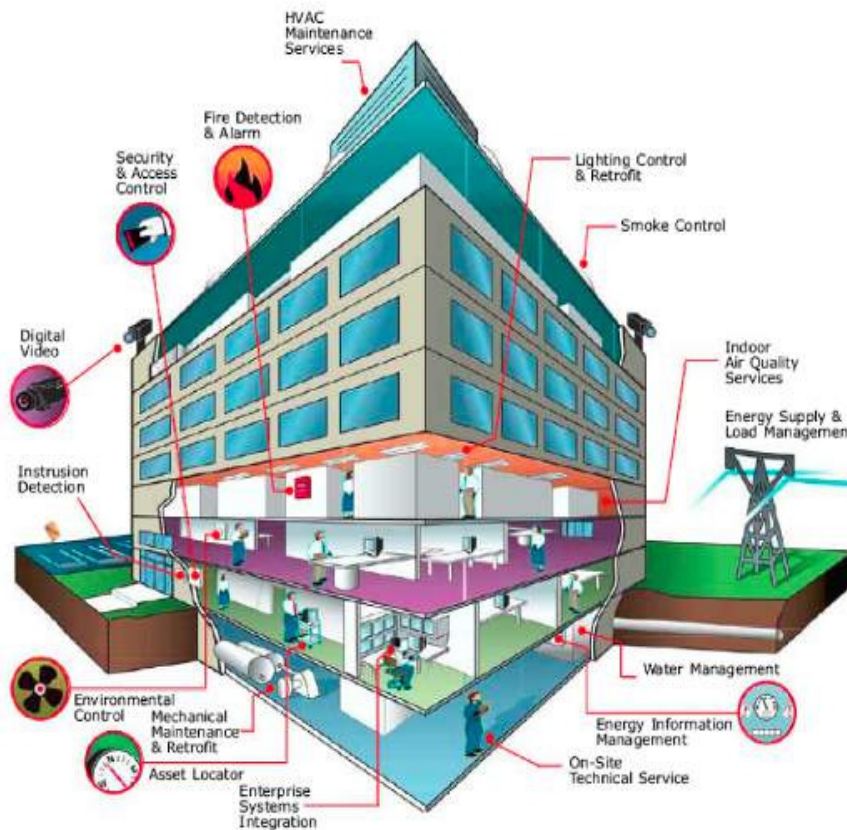


Westfield Shopping Centres:

Managed and analyzed the financial performance of its 44 centres and facilitated planning processes with near real time, centralized access to very granular information from disparate sources. Now, leasing finance team takes three minutes to produce initial consolidated reports – where it took around two weeks in the previous system.

What are smarter buildings?

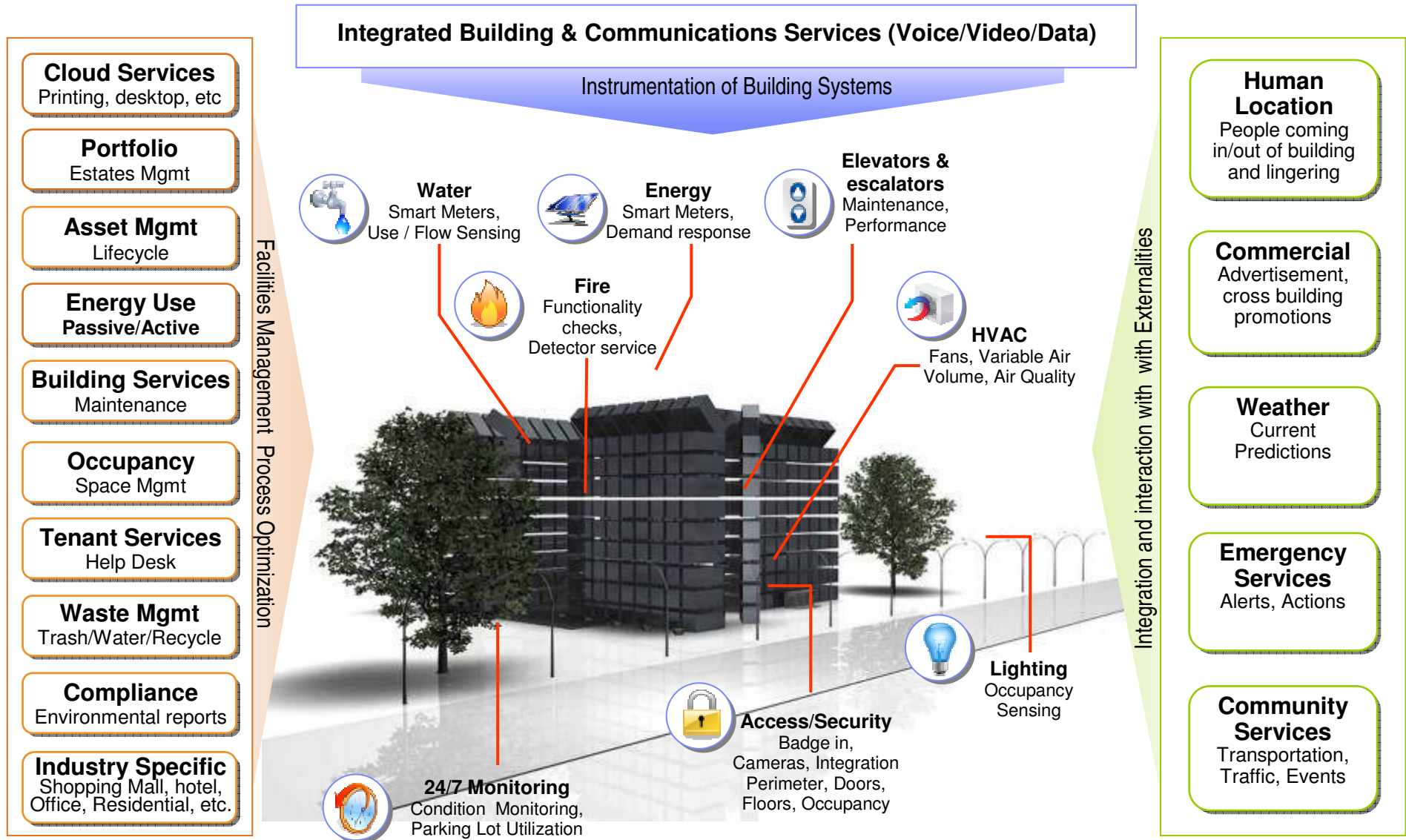
Smarter Buildings are well managed integrated physical and digital infrastructures that provide optimal occupancy services in a reliable, cost effective, and sustainable manner.



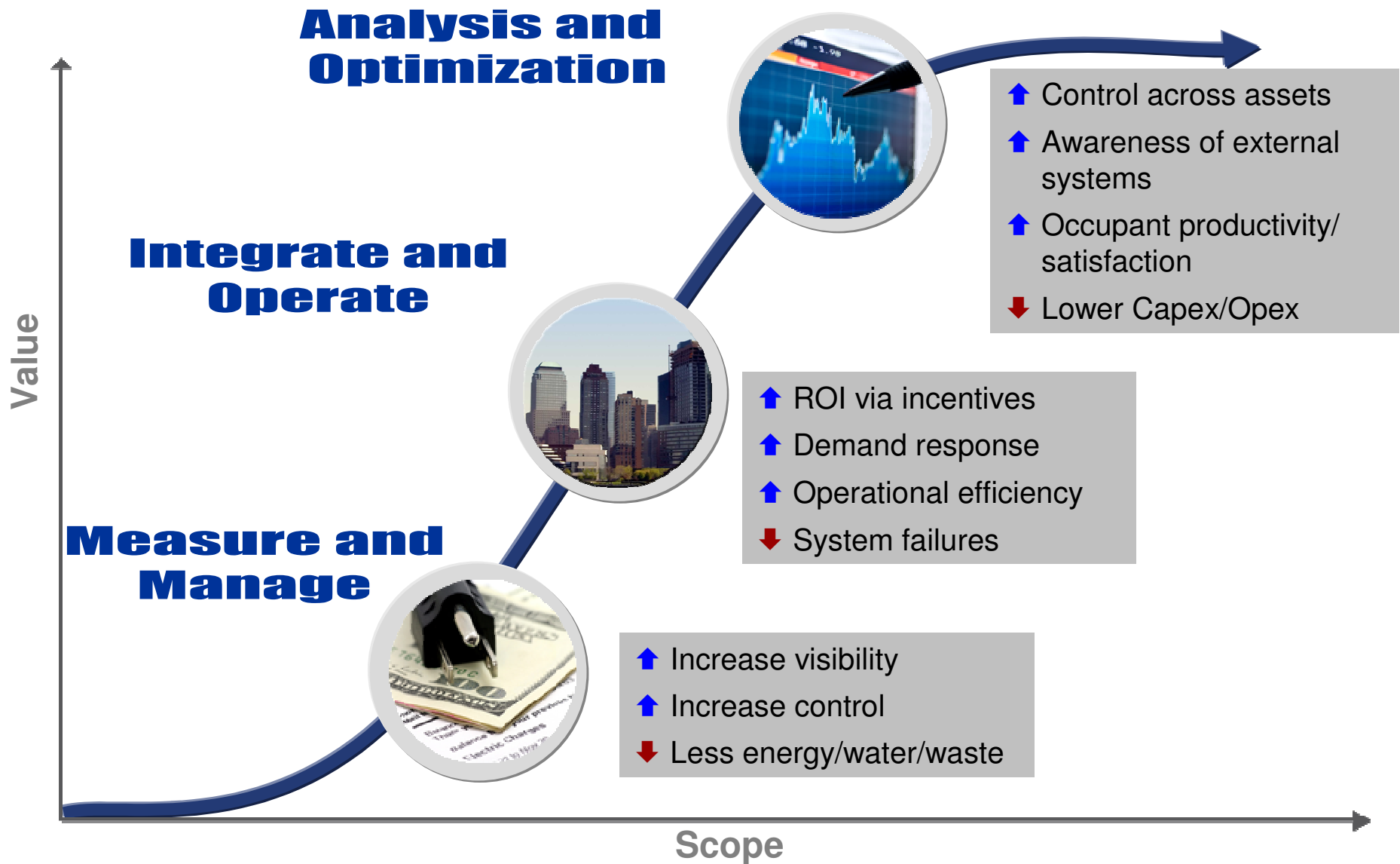
Smarter Buildings...

- Are more cost effective by reducing energy and operating costs.
- Use active and designed-in techniques to achieve efficiency and environmental responsibility.
- Have the ability to interact with occupants inside them as well as the environment around them.
- Maintain a safer and more secure built environment.
- Communicate in real-time to supporting infrastructure (i.e. broadband, wifi, etc.).

How does a building become smarter?



The path forward for Smarter Installations, Buildings



Capabilities needed to Measure and Manage

Precise Benchmark of Energy Use



- Accurate thermal and energy scan of facility
- Right size IT workload using best practices
- Auditable verification of demand reduction

Asset Management



- Track people/skills/materials/resource performance
- Maintain adequate protection and control access
- Streamline service request handling

Energy Management



- IT and Infrastructure instrumentation
- Threshold controls
- Visibility at user/department level

Governance and Business Strategy



- Comply with Country /Jurisdictional / Local regulations
- Establish company or organization goals .

Capabilities needed to Integrate and Operate

Converged communications backbone



- Integration of building infrastructure networks.
- Communications to various end point devices both wired and wireless.

Property Performance Management



- Application interfaces and agents to manage facilities portfolio across campus, state, country, and world.

Integration of facilities mgmt. processes



- Connect disparate systems to enable the transfer of business information to and from various technologies.

Facilities Dashboard



- Trend analysis and building maintenance diagnostics in a operations center view
- Building and process systems views

Capabilities needed for Analysis and Optimization

Smarter Building to Smart Grid Integration



- Metering services at control points within building
- Preselected parameters for demand response or load shedding

Business Modeling and Analytics



- Model, simulate, redesign and automate processes for energy efficiency and environmental impact

Space Management for Facilities



- Manage the infrastructure in line with occupant and building needs and improve utilization of space
- Chargeback capabilities for asset and resource use

Interaction with Externalities



- Optimize HVAC to current weather predictions
- Interact with community services, transportation, municipal water, or emergency alerts.

Three areas of **Smart Building** enabled by today's available technology



- Intelligent Building Management
- Pinpoint Performance Management & Financial Optimization
- Better Collaboration in Building / Facilities / Property Management



Smarter Buildings Implementations at Armonk and Rochester

Developed and Implemented with Smarter Building Alliance Partner Johnson Controls

Armonk, NY



▪ **Property Characteristics**

- 280,000 sq. feet
- Opened in September, 1997

▪ **Scope:**

- Metering
- PLC – BMS integration
- Advanced analytics
- Fault detection & diagnostics
- Dashboard for energy, carbon, maintenance, space, etc.

Rochester, MN



▪ **Property Characteristics:**

- 3.3M sq ft multi-building mixed use light industrial campus
- Facilities date to the 1950s

▪ **Scope:**

- BMS/metering integration
- HVAC sensors/metering point integration
- Lighting management
- Perimeter pre-heat
- Chiller optimization
- Advanced analytics/FDD.
- Dashboard for energy, carbon, maintenance, space, etc.

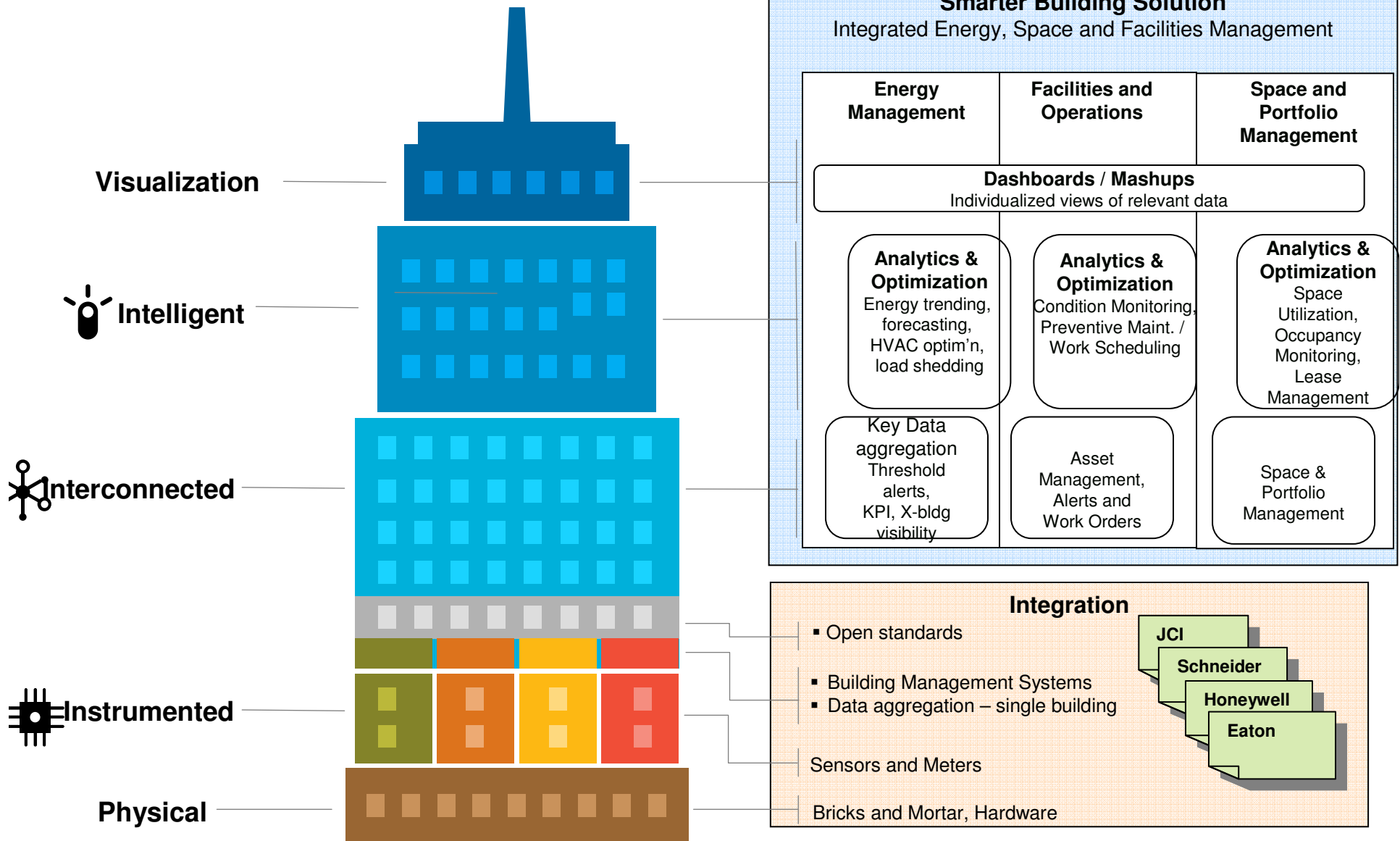
First IBM implementations.

Expect 5+% energy cost reduction in already efficient buildings that have seen 7% reductions/year for the last 10 years.

Operational cost reductions expected from condition-based maintenance and prioritization of preventive maintenance.



Capabilities deployed





IBM is ranked #1 Green Global Company by Newsweek

<http://www.newsweek.com/2010/10/18/green-rankings-global-companies.html>

Green Rankings: Global Companies

NEWSWEEK ranked the biggest publicly traded companies in developed and emerging world markets. Because a global ranking includes U.S. companies, some appear on both the U.S. 500 and the Global 100 lists. For green ideas that can change the world, [click here](#). View a [list of the top 10 greenest companies](#) [click here](#). View the full [methodology](#).

U.S. 500 Rankings

Global 100 Rankings

Filter by Industry Sector

Search by Company Name

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e.g. Hewlett-Packard

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POWERED BY factual

Showing Results 1 to 20 of the Green Rankings Global Top 100

Page 1 of 5 GO

RANK	COMPANY	INDUSTRY SECTOR	GREEN SCORE	ENVTL. IMPACT	GREEN POLICIES	REP. SURVEY
1	International Business Machines »	Technology	100.00	93.96	91.30	96.00
2	Hewlett-Packard »	Technology	99.33	58.92	95.56	92.87
3	Johnson & Johnson »	Pharmaceuticals	98.51	42.98	100.00	77.58
4	Sony »	Consumer Products, Cars	96.40	56.94	97.26	64.32
5	GlaxoSmithKline »	Pharmaceuticals	94.18	64.95	91.36	73.62
6	Novartis »	Pharmaceuticals	91.48	53.97	89.64	67.43



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Business

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More in Green Rankings



Searching for a New (Green) Holy Grail



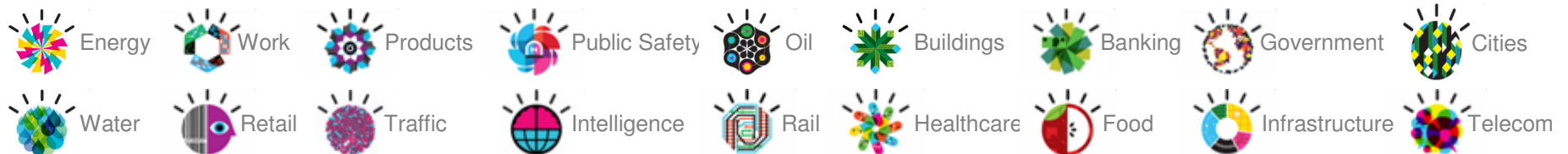
Photos: The 10 Greenest Companies



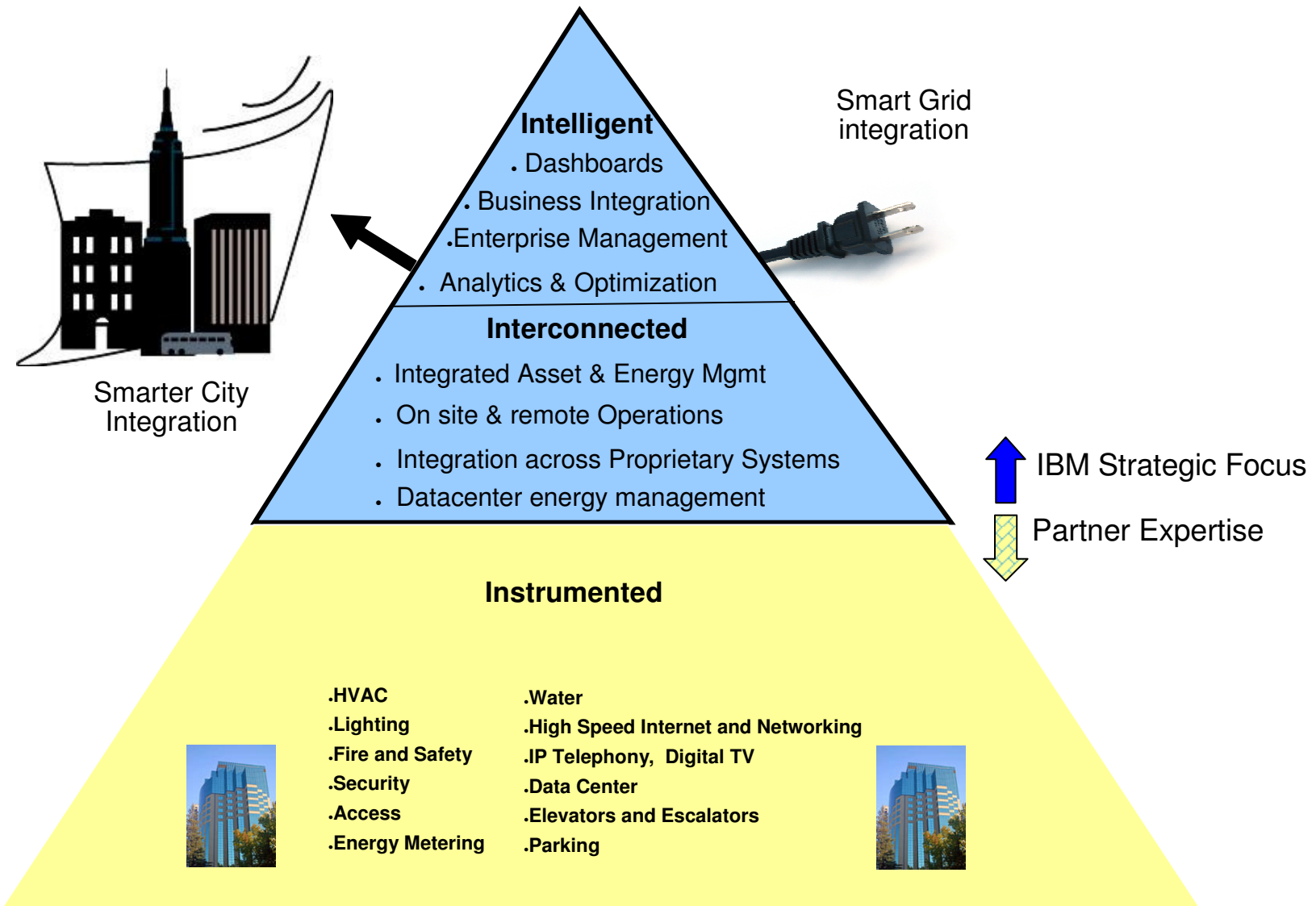
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IBM Smarter Buildings Strategic Focus



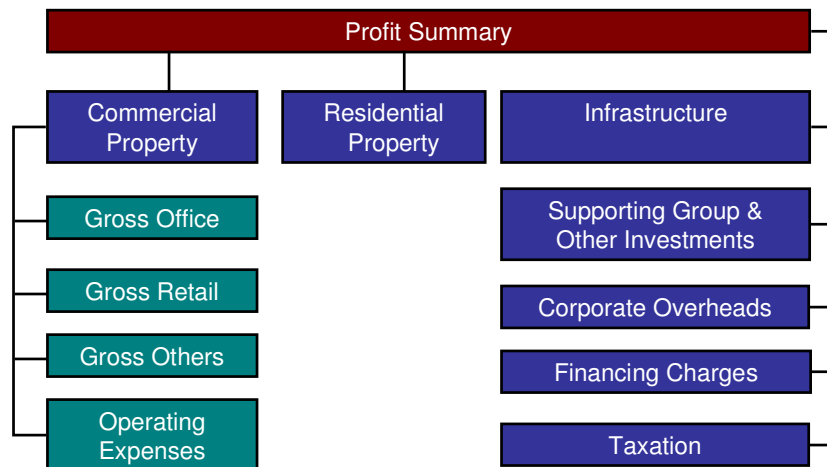
The Goal for Property Performance Management



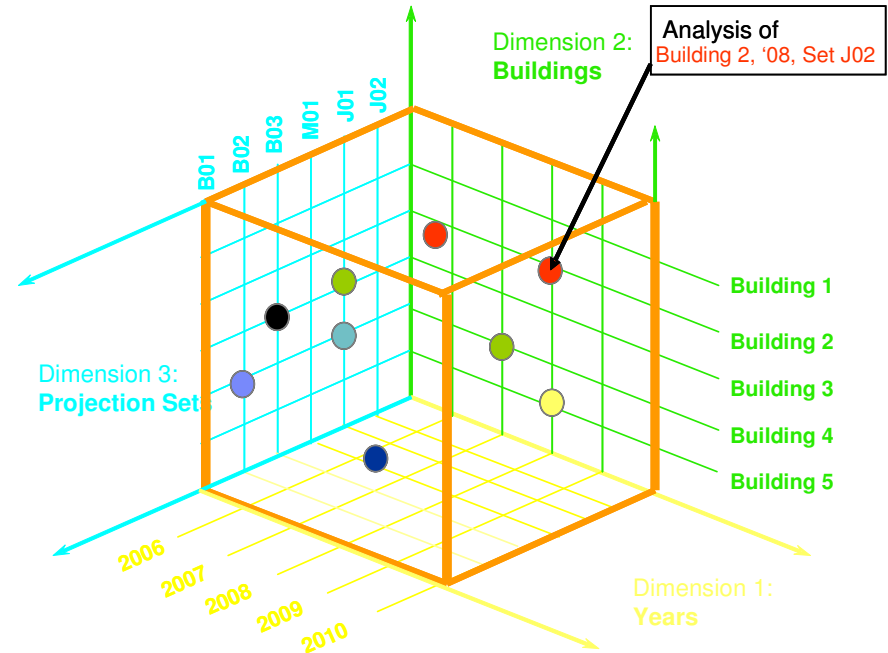
Financial Optimization through leasing / rental optimization

- The ability to optimize leasing rates requires the ability to consolidate financial data from disparate sources, have near real-time access to this centralized consolidated sources to analyze data for better decision making.
- Improves financial reporting, rental income projection and corporate budgeting

Data consolidation



Data analysis

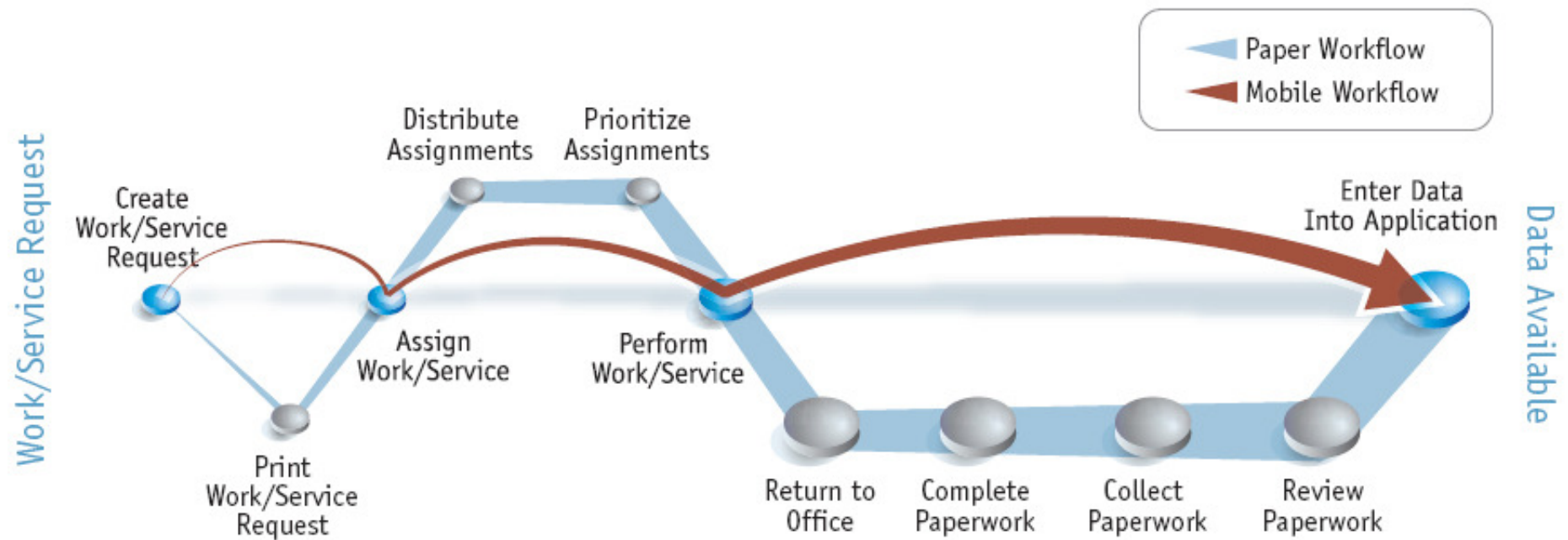


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Process simplification with Mobile

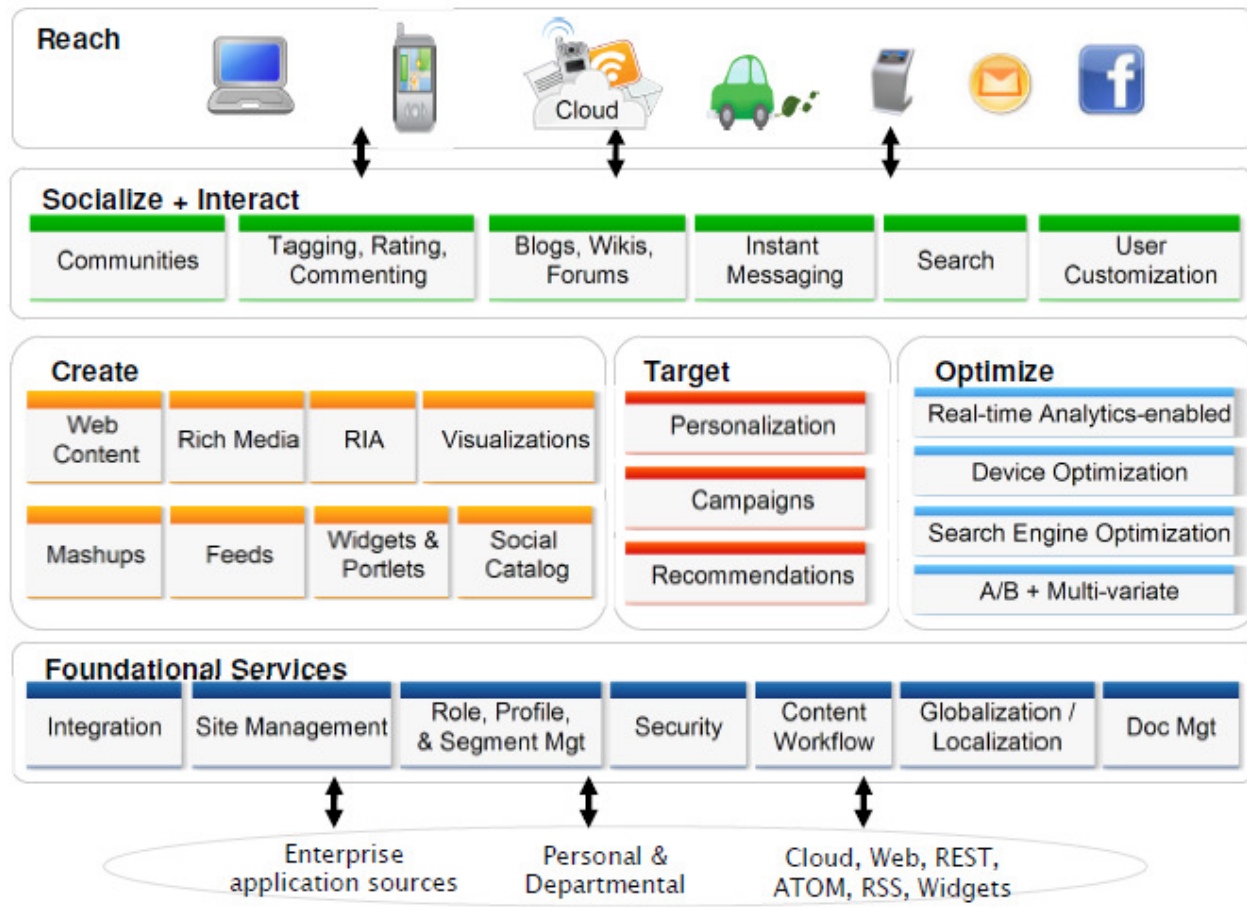


- **Benefits**
 - **Elimination of paper**
 - **Reduction of errors**
 - **Data and process currency**
 - **Work step reduction**

Enterprise-wide and multi-vendor communication tools

Enterprise Portal

Content Management



Document Management

E-Survey System

A Smarter Planet

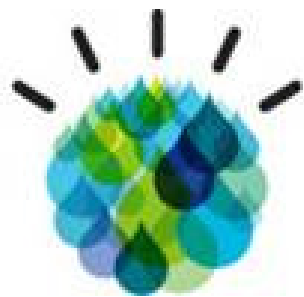
Instrumented

Interconnected

Intelligent



*An opportunity to think and act
in new ways:
economically, socially and technically.*



Thank You

If you need more information, please contact
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