The Future of Enterprise Computing

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"It's tough to make predictions, especially about the future."

– Yogi Berra

So, in this talk, I would not try to predict anything. Instead, I will go over the latest trends (supposedly, well-known facts) and also describe how the industry is responding to them. Based on the observation, I will discuss challenges and opportunities in them.
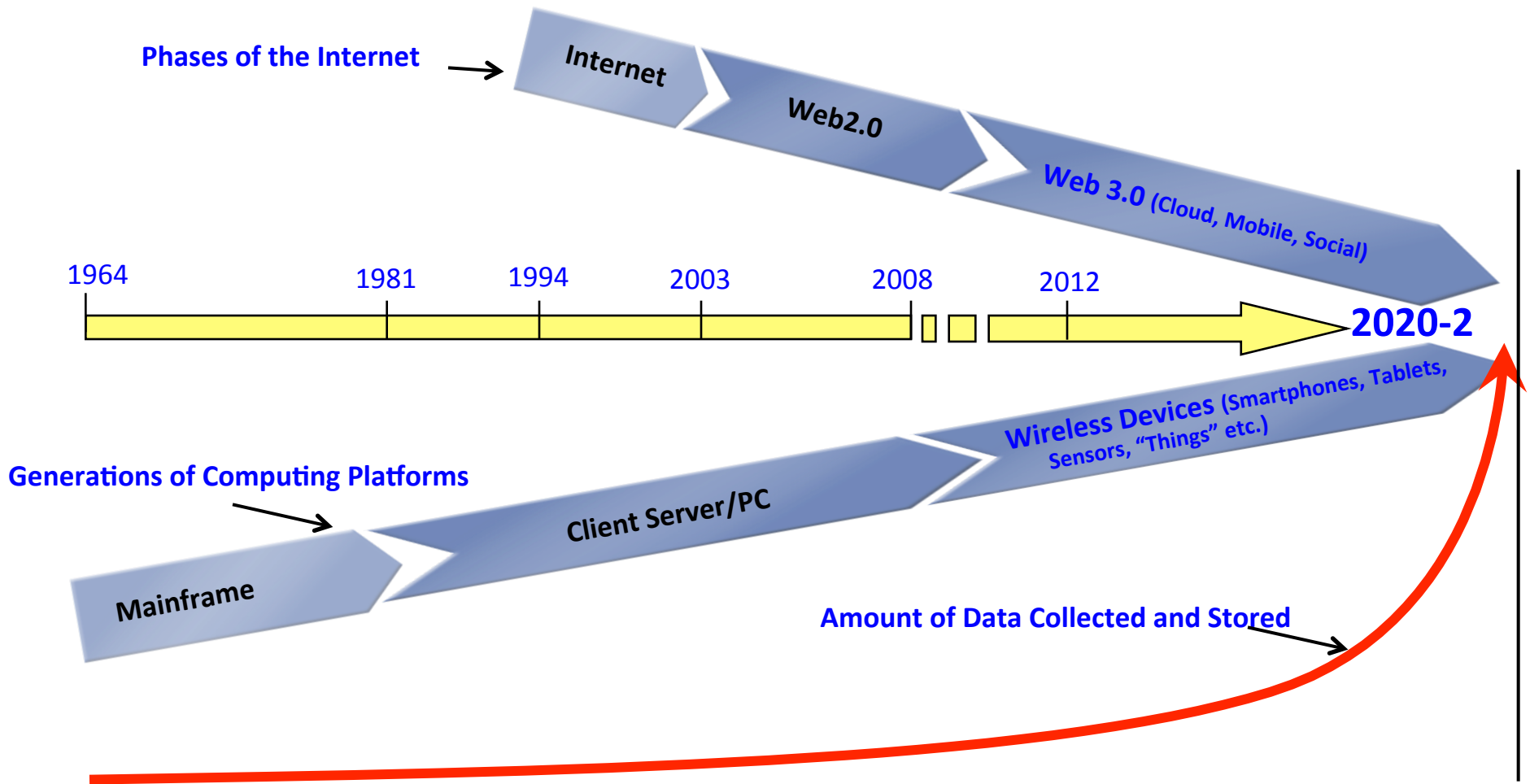
Abstract

With emerging computing trends of social, mobile, cloud and big data, and also with the new trend of BYOD (Bring Your Own Device) in companies, enterprise computing is recently going through transformational changes. This talk will start by looking at the recent computing trends, one by one, and their implication on the enterprise computing, individually and collectively. While the trends started mostly for consumer computing, they ultimately have a significant impact on enterprise computing. It is expected that they will transform how information and communication technologies are used in enterprises, and so that they will fundamentally and permanently change the nature of the business of enterprise computing. We will look at a number of recent example products and services for enterprising computing built on the emerging computing trends and catering their needs, in an effort to take a peek at where enterprise computing is going in the future. Based on this observation, we will discuss the challenges and opportunities in the future of enterprise computing.

Key trends across the *global economy* that impact Enterprise Computing in 2013

- Global growth returns, but at levels below long term averages

- Overall global risk declining, but risks remain everywhere, resulting in unpredictability

- European economic conditions improving but still unstable

- China economy is crucial, shows sign of weakening (and then strengthening)

- Developing economies now contribute more to world economic growth than developed economies

- Four big tech trends (cloud, social, mobile, analytics)

- Security: Cyber attacks becoming more targeted and sophisticated

- Unrelenting march of commoditization

- Demographic shifts continue as people live longer

The 3rd generation of **computing platform**, the 3rd phase of the **Internet**, and the explosion of **Big Data** are colliding to form a perfect storm of disruption and transformation

Phases of the Internet →

Internet

Web2.0

Web 3.0 (Cloud, Mobile, Social)

1964   1981   1994   2003   2008   2012   **2020-2**

Generations of Computing Platforms →

Wireless Devices (Smartphones, Tablets, Sensors, "Things" etc.)

Client Server/PC
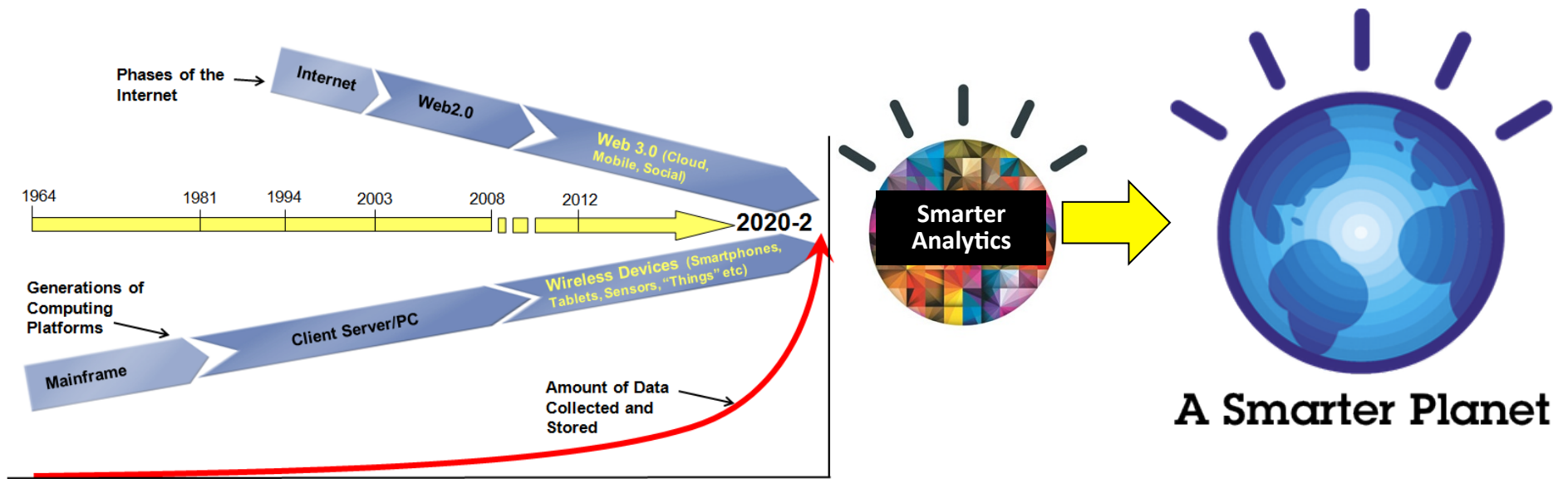
Mainframe

Amount of Data Collected and Stored →

Collision of these forces will require enterprises to be experts at using *Advanced Analytics* to uncover insights and make decisions
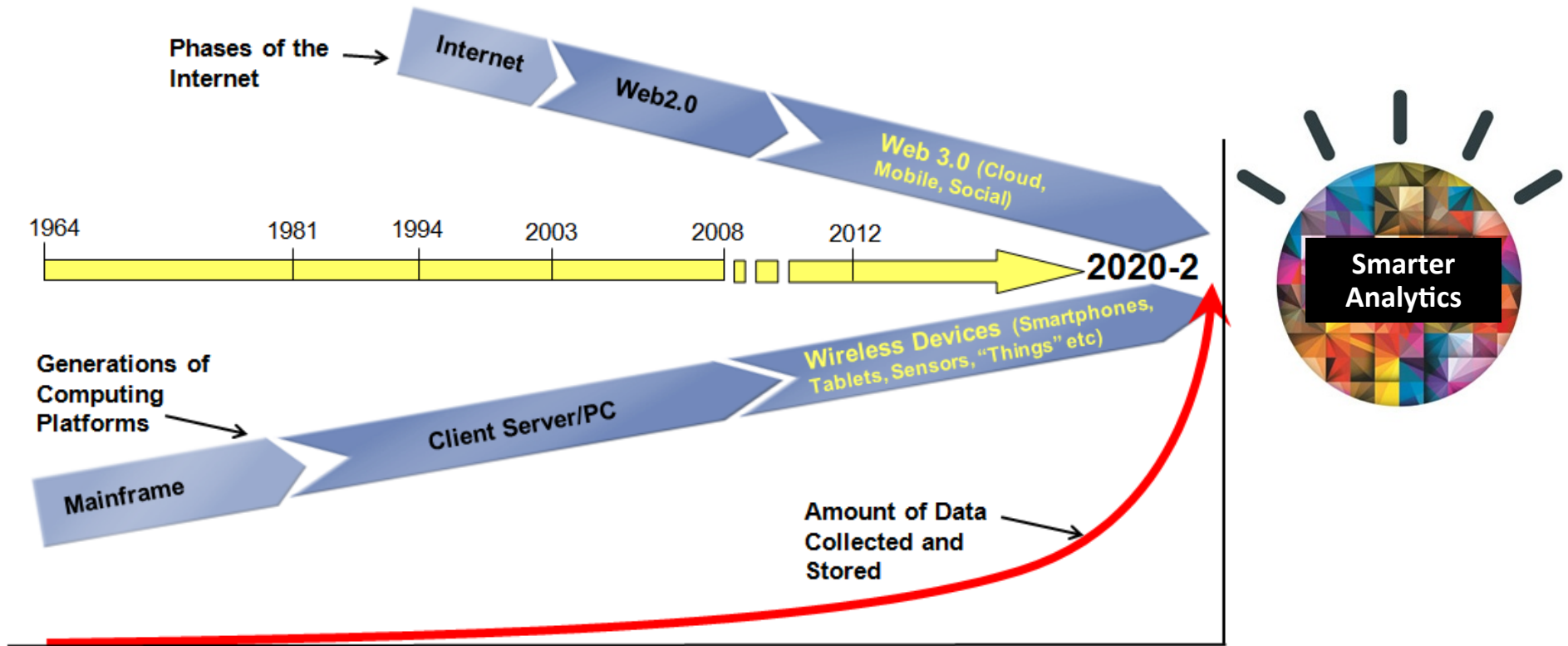
"*Identifying patterns, anticipating outcomes and proactively optimizing a response will be the basis for competition in the future. In the next 10 years, the companies that don't have analytics deeply embedded in their business model will most likely cease to exist.*" – **Gartner (**link**)**

When Smarter Analytics is applied successfully to this perfect storm of disruption and transformation, the world will become a Smarter Planet

Phases of the Internet → Internet → Web2.0 → Web 3.0 (Cloud, Mobile, Social)

1964   1981   1994   2003   2008   2012   2020-2

Generations of Computing Platforms

Mainframe → Client Server/PC → Wireless Devices (Smartphones, Tablets, Sensors, "Things" etc)

Amount of Data Collected and Stored

Smarter Analytics

A Smarter Planet

"On a Smarter Planet, those with the best analytics win" – IBM (link)
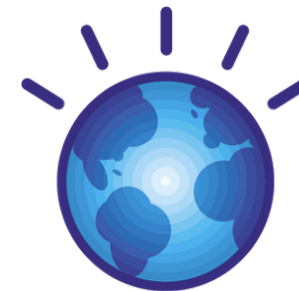
Technology Trends in 2013
technologies that are the building blocks of the Smarter Planet

Trends to Watch – 2013

1. Consumerization
2. Virtualization
3. Cloud Computing
4. Social Business
5. Digital Marketing
6. Mobile Computing
7. BYOD
8. Internet of Things
9. Big Data
10. Analytics
11. Data Visualization
12. Gamification
13. Security
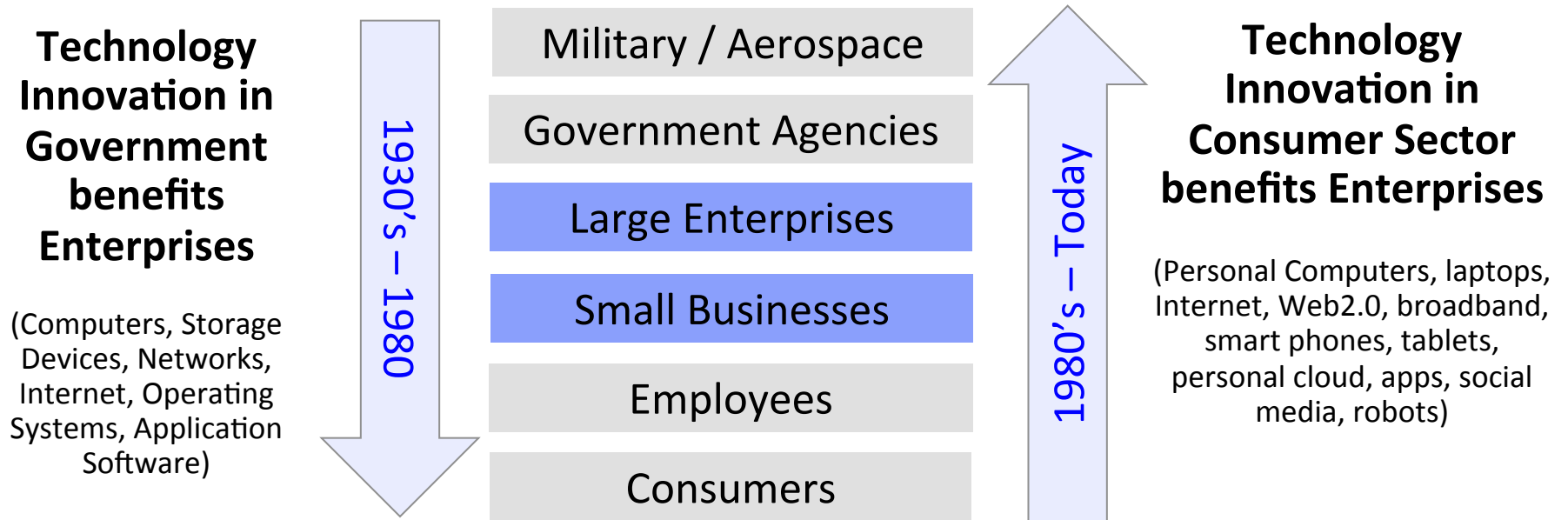14. Sustainability & Green IT

A Smarter Planet

Some of the trends on this list are more mature in their adoption and development than others. However, these are the key trends that CIOs and IT leaders will be wanting information on during 2013....and that's why they are on the list.

Source: IBM *Horizon Watch*

Technology Trends in 2013

1	**Consumerization of IT**	*Employees are demanding more choice and control. They want the same technologies and digital experiences they have as a consumer.*
2	**Virtualization**	*Continued growth across infrastructure. SMB is sweet spot for server/storage virtualization. Large enterprises see growth in desktop & network virtualization*
3	**Cloud Computing**	*Growth among all types. Hybrids become more popular. Maturation/past the hype. Intersection with mobile.*
4	**Social Business**	*It's more than a technology, its about connecting people. Changing culture (A Senior Exec responsibility) is key to successful implementation.*
5	**Digital Marketing**	*Marketing is being transformed by digital on all fronts. They need help from IT.*
6	**Mobile Computing**	*Mobile is HOT. Devices, Apps, clouds, analytics. New UIs needed. Accelerates consumerization into all industries.*
7	**BYOD**	*IT departments need help with Mobile Device Management. And what is the ROI?*
8	**Internet of Things**	*Billions of sensors. Millions of Sensor Networks. Embedded Intelligence. M2M Communications. Execs and IT Leaders need to understand how to leverage it all.*
9	**Big Data**	*Explosion of data. How to collect, store, manage the data so it can be analyzed? Hadoop getting better. Data Scientists are needed. Training required*
10	**Analytics**	*The on ramp to the Smarter Planet. Embedded, predictive, unstructured, mobile. Applications for all processes. Need changes in culture, skills, business processes.*
11	**Data Visualization**	*Awareness of value increases. Simple is better than complex. Growth in dashboards, mobile apps, 3D, etc. Training required for all analysts.*
12	**Gamfication**	*Not easy to implement, but case studies and best practices point to significant value….resulting in increased interest. Focus on upfront design ensure success.*
13	**Security**	*More sophisticated external threats. Impact of mobile, social, and cloud. Moving from a technology issue to a business operations issue*
14	**Sustainability & Green IT**	*Becoming a key market differentiator, not just all about efficiency and compliance. Focus on energy management across the entire physical infrastructure*

The Consumerization trend is all about driving innovation in technology from the perspective of the individual consumer or employee

Technology Innovation in Government benefits Enterprises

(Computers, Storage Devices, Networks, Internet, Operating Systems, Application Software)

1930's – 1980

Military / Aerospace

Government Agencies

Large Enterprises

Small Businesses

Employees

Consumers

1980's – Today

Technology Innovation in Consumer Sector benefits Enterprises

(Personal Computers, laptops, Internet, Web2.0, broadband, smart phones, tablets, personal cloud, apps, social media, robots)

Consumerization of IT Trends

1. **Mobile Devices:** CIOs should expect new devices to be announced and adopted by users…who will want to use them to access enterprise information.

2. **Mobile Apps:** Enterprise Mobile developers copy consumer mobile app ideas as they try to provide similar capability for enterprise workers.

3. **Enterprise App Store:** Employees want the look and feel of their consumer app store…and not just for mobile apps, but for all computing apps.

4. **Collaboration Revolution:** Individuals increasing expect corporate collaboration and HR platforms to have capabilities they see in social tools like LinkedIn, Facebook, Twitter, FaceTime, and Google+

5. **Cloudy Expectations:** More consumers are using increasingly sophisticated, cloud-based software to store and manage their personal information and they expect IT departments to deliver that same capability.

"The emergence of consumer markets as the primary driver of information technology innovation is seen as a major IT industry shift, as large business and government organizations dominated the early decades of computer usage and development." **– Wikipedia (**link**)**

Consumerization of IT Trends (cont.)

6. Work from Home Employees: This sometimes "forgotten" segment of enterprise workers increasingly demands improved collaboration, social, and unified communications tools

7. Walking in the user's shoes: CIOs and IT departments need to understand the user's perspective in order to design and deliver an experience that mirrors what consumers experience every day.

8. Rapid Innovation and Prototyping: Consumer technology advances at lightning speed. More IT Departments will try to become more agile and do the same for their users.

9. Fun on the Job: Consumer Games drive innovation in Enterprise Gamification

10. Consumerization in Other Industries: Consumerization is impacting Education, Healthcare, Banking, and other industries, causing CIOs in those industries to have to innovate.

How Consumerization of IT is driving business
- Dachis Group

Virtualization Trends

1. **Server and Storage Virtualization:** SMB Market catches the wave, but needs services and solutions to be tailored to them.

2. **More Than Just Servers & Storage:** Large Enterprise focus turns to rest of infrastructure, including Desktop, Networks, and Data Center.

3. **Desktop Virtualization:** Growth continues with focus on network security & efficiency, driven by the mobile and BYOD trend.

4. **Software Defined Networking (SDN):** Expect lots of activity as SDN demand continues to grow and product innovation occurs.

> *"The Virtualization Solutions market is expected to grow 12.3% year over year in 2013 and maintain this pace as it moves from 14% overall market share in 2011 to more than 20% in 2016."* – **IDC** (link)

> *"Server virtualization is a mature technology, but, as an IT initiative, it's in its adolescence and is disruptive to IT users and providers.."* – **Gartner** (link)

Virtualization Trends (cont.)

5. **Virtualizing Linux Workloads:** Linux server virtualization grows and plays "catch up" to Windows

6. **Containerization:** Interest increases in O/S Virtualization

7. **Mergers & Acquisitions:** Activity grows and valuations increase

8. **Vendor Competition Heats Up:** VMWare is King
   - but competitors are becoming more attractive
   - Lower prices: More competition means lower prices
   - Innovation: More competition means more innovation
   - Multiple Vendor Strategy: Growing number of firms try this approach

Virtualization: More than you've been led to believe - IBM Webinar

IBM
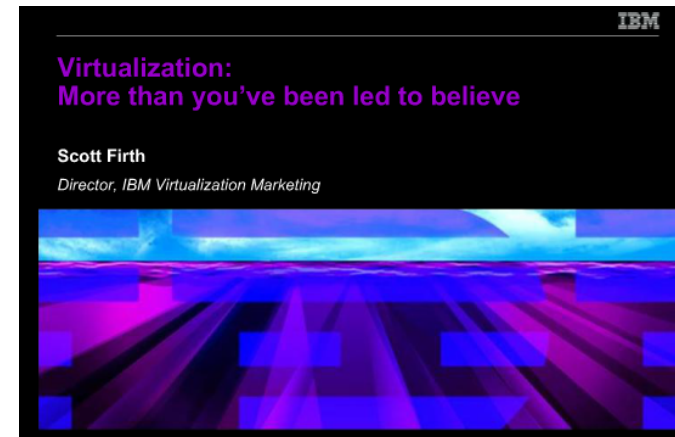
Cloud Computing Trends

1. **Growth:** Growth continues across the board in public, private, and hybrid clouds as benefits are too good to pass up.

2. **Private Cloud:** The hype is over. Expect deployments to increase significantly in 2013

3. **Hybrid Clouds:** Security and outages of public clouds drives demand. CIOs want to know how to secure, manage, and govern hybrid cloud environments

4. **Public Clouds:** Competitors wishing to compete against Amazon in IaaS market must differentiate their services somehow.

5. **Personal Clouds:** Technology innovation in personal clouds will drive enterprise clouds

"2013 is the year that companies need to implement a hybrid cloud strategy that puts select workloads in the public cloud and keeps others in-house." – **Computerworld (**link**)**

"The cloud will change IT as nothing before it has." – **Gartner (**link**)**

Cloud Computing Trends (cont.)

7. **Mobile Clouds:** A whole new generation of cloud apps designed for mobile work force.

8. **Cloud Integration and Management**: IT shops will need help integrating and managing the growing number of Clouds used throughout the enterprise

9. **Cloud Security:** IT departments need to stay on top of this. Expect the market for Cloud Security Services to grow thanks in part to growth of BYO devices and apps.

10. **Demand for Skills:** According to an IDC study, the demand for cloud computing will grow at six times the rate of IT skills overall.

11. **Impact on Role of CIO and IT Staff:** CIOs need to secure, manage, and govern cloud services. Gartner sees a new role - Cloud Brokerage Services

Exploring the frontiers of cloud computing
- IBM Center for Applied Insights Report

IBM Center for Applied Insights

Exploring the frontiers of cloud computing
Insights from Platform-as-a-Service pioneers

Social Business Trends

1. **It's more than Social CRM:** Social Business capability is increasingly embedded into all traditional applications.

2. **CEO (and Senior Execs):** Finally realize it's not a fad, but a new way of doing business. They step up to owning the transformation challenge.

3. **CIOs take more of an interest:** Driven by CEO/LOB interest as well as IT concerns (security, integration, control, user experience, etc.).

4. **Processes start to change:** It's not about the technology, it's about how we work.

5. **Analytics:** New dashboard analytics and visualizations provide progress reports to execs on how the transformation is going

"A social business is a truly connected business. It connects its employees with each other and them with the marketplace." **– Dachis Group (**link**)**

"Most companies approach enterprise social networks as a technology deployment and fail to understand that the new relationships created by enterprise social networks are the source for value creation" **– Altimeter Group (**link**)**

Social Business Trends (cont.)

6. **Social Media Marketing:** Enterprise Marketers need to pull in the reins, clean house, and re-focus on relationship engagement.

7. **Renewed Focus on Owned Properties:** Data ownership, security and control are a concern.

8. **Community Marketing:** .com Communities spring up around every topic, every function, every business process. Many are mismanaged and will fail within 90 days after launch.

9. **Education & Training:** Companies deploy tailored education to employees, segmenting them based on their needs and experience levels.

10. **Reward Programs:** Gamification applied to social business results in socially active customers, employees and partners being more motivated, rewarded, and recognized.

What Is Social Business?
YouTube Video Playlist by IBM
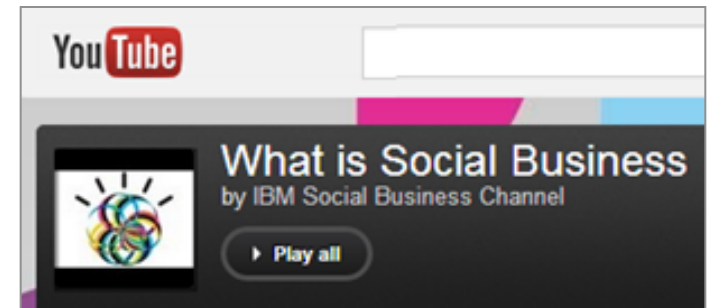
Digital Marketing Trends

1. **Advanced Analytics:** Social, Customer, Mobile, Web

2. **Influencer Marketing:** Cultivating influencers into advocates

3. **Content Marketing:** Content designed to educate vs. sell

4. **Blogging:** Expect a resurgence in blogging with a focus on delivering thought leadership and education.

5. **Mobile Marketing:** Pilots should be over by now. Time to deploy apps that deliver business value across critical business processes.

6. **Social Media Marketing:** Pull in the reins, cleaning house, and re-focus on relationships

"The digital revolution has forever changed the balance of power between the individual and the institution" - **IBM** (link)

"In general, IDC believes that most marketing organizations are not ready to deal with the complexity of marketing automation, from the standpoint of proficiency and maturity " - **IDC** (link)

Digital Marketing Trends (cont.)

7.   Video Marketing: Integrating Video into all Content
Marketing efforts

8.   Personalization: Driven by big data and advanced analytics

9.   Digital Experience: Optimizing the cross-channel
customer digital experiences

10. Digital Skill Shortages: Can you teach an old dog new
tricks?

11. CMO / CIO Partnership: Redefining relationships and
setting goals together

CMOs and CIOs – Acquaintances or allies?
- An IBM Institute for Business Report

IBM Global Business Services
Executive Report

C-suite
Studies

IBM Institute for Business Value

CMOs and CIOs
Acquaintances or allies?
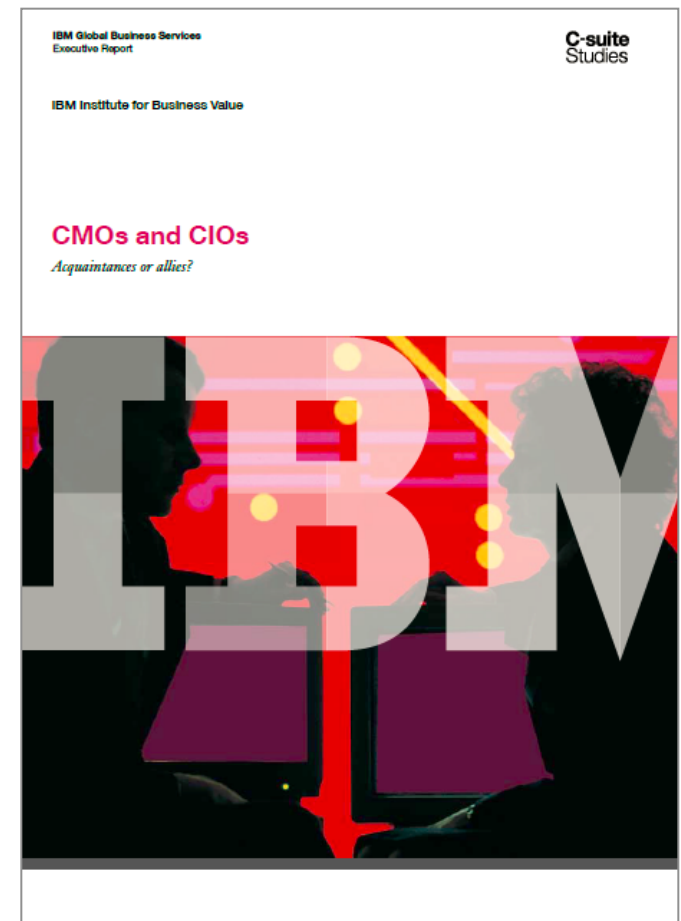
Mobile Computing Trends

1. **Mobile App Developers Are Popular**: As businesses find new ways to harness mobility in 2013, the demands for specialized apps and support will only increase.

2. **Consumerization:** BYOD is here to stay....and Consumerization leads to other related BYOs (personal cloud, app stores, Windows 8, etc.)

3. **Mobile Device Management:** Growth in BYOD programs will lead to increased popularity of MDM solutions and services

4. **Mobile Collaboration:** Social Business trend drives need for new mobile collaboration capability

5. **Video Streaming:** Live and recorded videos embedded into mobile business processes

6. **HTML5 comes on board:** Android and iOS have the market for the moment, but developers are also interested in HTML5

"In 2013, mobile workers and consumers will embrace tablets, mobile content, mobile video and personal cloud services at unprecedented levels.." **– Yankee Group (**link**)**

"IT organizations must rapidly evolve mobile applications and interfaces to meet sharp increases in demand across B2B, B2E and B2C channels" **– Gartner (**link **)**

Mobile Computing Trends (cont.)

7. **Mobile Assistants:** Workers demand enterprise versions of Watson/Siri for mobile search and productivity apps

8. **Mobile Analytics and Visualization Apps**: New analytical and visualization solutions will be developed and deployed for remote and mobile workers.

9. **Mobile Clouds:** Enterprises will develop and deploy mobile clouds for specific apps

10. **Mobile Payments:** Employee expenses paid via mobile. Business accepting payments for products solutions and services via mobile

11. **Increased Need for Speed:** Big data, analytics, social, and mobile video will drive demand for faster mobile networks

12. **CIO Leadership:** CIOs take more of a leadership rol in managing the enterprise mobile strategy, including developing new business models, embedding mobile technology innovations into processes, and protecting mobile data.

Accelerating your Business through Mobile Engagement - IBM Video
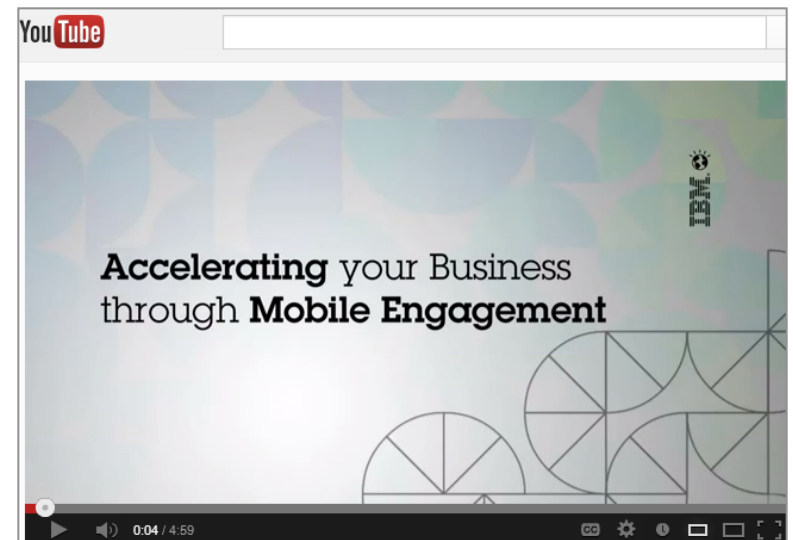
BYOD Trends

1. **Number of Devices:** Many workers today are carrying three devices: Laptop, Tablet and Smartphone.

2. **Diversity of Devices:** Different manufacturers and different operating systems.

3. **Increased IT Responsibilities:** IT departments ramp up to handle Mobile Device Management and Security requirements

4. **Best Practices / Case Studies:** As BYOD programs increase, demand will increase for industry-wide best practice and case study documentation.

> *"CIOs globally are faced with the unprecedented challenge of an explosion of popular devices and applications in their enterprises that they are struggling to control from a technological, policy, and cultural perspective"* – **IDC (**link**)**

BYOD Trends (cont.)

5. **Geographic Differences:** BYOD programs need to be customized by geographic region.

6. **Mobile Device Policies:** Enterprises develop guidelines/standards for employees to follow

7. **Mobile Workforce Training:** Leading edge organizations develop and provide mobile device and mobile app trainings as part of their BYOD program

8. **What's the ROI of BYOD?:** With the increased Mobile Device Management requirements, look for CFOs to evaluate whether BYOD really saves any real money.

6 Things To Think About Before Implementing BYOD – IBM Presentation

IBM Mobile: Manage & Secure by IBMMobileEnterprise

6 Things To Think About
Before Implementing
BYOD

Kimber Spradlin, CISA, CISSP

Pulse2012
Optimizing the World's Infrastructure

March 4–7
MGM Grand – Las Vegas, Nevada

© 2012 IBM Corporation

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Internet of Things Trends

1. **Thank you IPv6!:** Connectivity and Communications of IoT is enabled by IPv6, which is replacing IPv4.

2. **It's About Sensors:** They are getting smaller, smarter, and cheaper….and there are billions of them.

3. **Machine to Machine:** Sensor and systems of sensors talking to each other and data centers via wireless communications

4. **Like A Nervous System:** IoT can enable an automated sense and respond system for any business process or application.

5. **Big Data to get Bigger:** All these 'things' (sensors) will produce even more data than we have now, taxing our already complex enterprise Information Management sytems.

"The Internet of Things is the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment." **– Gartner (link)**

"Internet-of-Things (IoT) provides the foundational infrastructure for a smarter planet, and offers significant growth opportunities in IT, infrastructures and services" **– IBM (link)**

Internet of Things Trends (cont.)

6. IoT Analytics: Advanced analytics and dashboards will be needed to provide insights from all the 'things'.

7. Clouds that Scale: Some IoT systems and networks may have to scale quickly and autonomously.

8. CIOs Need to Prepare: CIO Leaders and Innovators will begin strategizing how to best make use of IoT for their organizations.

9. Education Needed: Expect increased demand for education and skills training related to Sensor Networks and what to do with the data collected.

10. Product Design: Consumers and Customers will increasingly expect products to come with embedded sensors.

The Internet of Things **– An IBM Video**

Big Data Trends

1. **Definition Does Not Matter:** The focus turns towards implementation and value

2. **Cost as a Big Data Benefit:** Case studies demonstrate ROI of Big Data. It is leaner, significantly reduces data integration costs, and opens the door for data exploration

3. **Analytics and Visualization:** For those implementing Big Data, there will be an increased interest in Analytics and Visualization capabilities.

4. **Data Scientists:** There will be a rush to hire skilled Big Data Scientists, often via services like Kaggle, who are specialist in designing how a firm collects, stores, and manages big data.

5. **Increased Competition:** IBM, EMC, SAP, SAS, and Oracle all increase competitive efforts, leading to better solutions and services

"IDC expects the Big Data technology and services market to grow at a 39.4% compound annual growth rate through 2015." **– IDC** (link)

"Big data is the frontier of a firm's ability to store, process, and access (SPA) all of the data it needs to operate effectively, make decisions, reduce risks, and create better customer experiences." **– Forrester Research** (link)

Big Data Trends (cont.)

6. **Big Data as a Service:** Service Providers emerge to handle the whole stack.

7. **Data Protection:** CIOs implement automated systems to handle all replication, deduplication, backup, and restoration.

8. **Followers Left in Dust:** Organizations that do not implement Big Data solutions risk losing their competitive edge.

9. **CMOs overwhelmed:** CMOs are not prepared to handle all the big data. In 2013 marketing needs to learn to work better with IT

10. **Education and Training:** Big Data Services firms will offer extensive training and certification programs to try to help fill the shortages of skilled Data Scientists.

What is Big Data? Part 1 – IBM Video

Analytics Trends

1. **Customer Analytics:** Personalized, cross-channel, customer-driven analytics will drive new focus on delivering individualized, personalized digital experiences

2. **Mobile Analytics.** Increased use of mobile will drive requirement for analytics applied to mobile generated data

3. **Social and Textual Analytics.** Moving beyond batch listening, Social Business Managers want to be able to analyze social conversations and influencer networks in real time.

4. **Predictive Analytics:** New innovative applications of advanced algorithms and modeling techniques will advance the science of predictive analytics.

5. **Real-Time Analytics.** As decision makers get a taste for what can be done, they will want that information faster…..and eventually in real time

"International Data Corporation (IDC) forecasts that it (Business Analytics) will continue to grow at a 9.8% compound annual growth rate (CAGR) through 2016 to reach $50.7 billion" – **IDC (**link**)**

"Spending on marketing analytics to increase 60% in 3 years." – **Gartner (**link**)**

Analytics Trends (cont.)

6. Interest Grows in Data Visualization:
Enterprises learn that managing and extracting insights from Big Data is not enough...you need to be able to display the insights for decision makers.
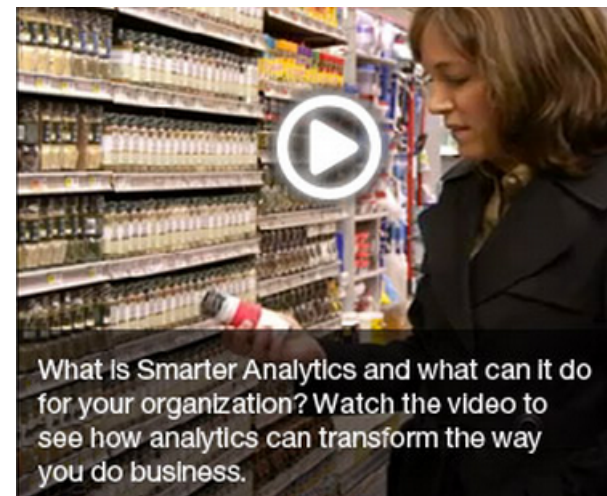
7. Self- Service. Decision makers will increasingly want access to simple to use analytic tools that provide visualization rich output. Oh....and they want that output on their tablet.

8. Hadoop matures. Hadoop functionality improves and CIOs begin to consider it for mission critical applications

9. Data Scientists: There will be a rush to hire skilled Big Data Scientists, often via services like Kaggle.

10.Education and Training: Big Data & Analytic Services firms will offer extensive training and certification programs to try to help fill the shortages of skilled Data Scientists.

What is Smarter Analytics? – IBM Video

What is Smarter Analytics and what can it do for your organization? Watch the video to see how analytics can transform the way you do business.

Data Visualization Trends

1. **Awareness:** In 2013, there will be increased awareness of the benefits of data visualization, leading to more requests for information, demos, and case studies.

2. **Growth:** Focused vendors like Tableau and Spotfire continue to innovate and grow at a rapid pace as decision makers demand improved data visualization capability.

3. **Large Vendors:** Larger IT vendors will increase investments in this market to complement Big Data and Analytic capabilities.

4. **Self Service:** The self service trend extends to visualization tools as users want to be able to manipulate the data, simulating expected changes in data in real-time to see impact

5. **Mobile:** There will be increased demand for data visualization capabilities on tablets and smartphones.

"Enterprises find advanced data visualization (ADV) platforms to be essential tools that enable them to monitor business, find patterns, and take action to avoid threats and snatch opportunities." – **Forrester (**link**)**

"Identifying patterns, anticipating outcomes and proactively optimizing a response will be the basis for competition in the future." **– Gartner (**link**)**

Data Visualization Trends (cont.)

6. **Simple is Better:** Most decision makers value simple over complex visualizations with lots of 'bells and whistles'.

7. **Telling a Story:** Visualizations that tell a story are preferred, resulting in a need for analysts who can craft a good story.

8. **Hall of Fame:** Vendors develop websites that highlight best of breed visualization examples to help educate and sell.

9. **Augmented Reality:** AR is still an emerging technology, but enterprises will continue to experiment with it as a way to display information in real-time and context aware situations.

10. **3D Visualizations:** Used in product development for years, 3D is being increasing applied to business analytics as a way of helping decision makers understand insights in big data.

Hans Rosling's 200 Countries, 200 Years, 4 Minutes - The Joy of Stats
– Video posted on Youtube
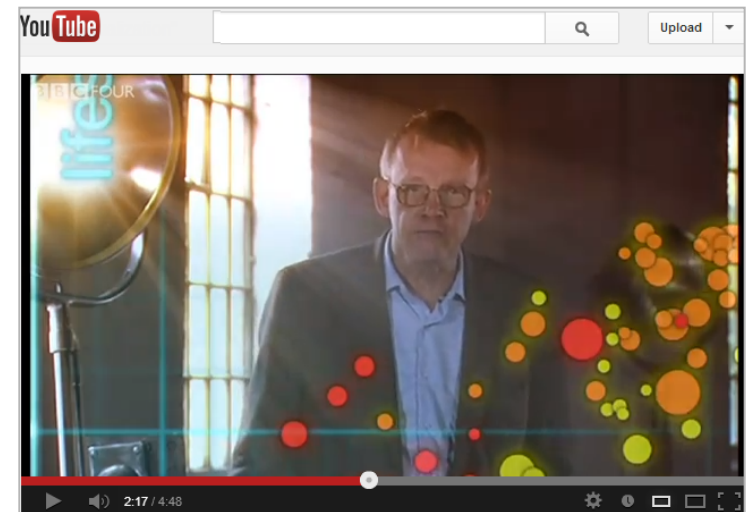
Gamification Trends

1. **Gamification Grows Up:** As the media buzz from 2012 continues, case studies highlight successful uses of Gamification and Business Leaders realize there is business value.

2. **Designing for Success:** Case Studies and Industry Best Practices will reveal significant differences in design requirements depending on desired outcome.

3. **Gamification is not easy:** Successful implementations of Gamfication can require significant upfront planning and design work.

4. **Integration with Mobile, Social & Collaboration Platforms:** Users increasingly prefer Gamfication efforts that are integrated with existing mobile, social and collaboration platforms.

5. **Large Enterprise App Vendors Experiment:** Expect large application vendors to experiment with embedding Gamifcation techniques directly into business applications.

"By 2014, more than 70 percent of Global 2000 organizations will have at least one "gamified" application" – **Gartner (**link**)**

"For a gamified application truly to engage its audience, three key ingredients must be present and correctly positioned: motivation, momentum and meaning (collectively known as "M³")." - **Gartner (**link**)**

Gamification Trends (cont.)

6. Gamification Analytics: Expect innovative uses of analytics to understand how to optimize Gamification techniques in order to influence behavior.

7. Significant Benefits: In 2013, there will be increased industry case study examples that demonstrate the value a cohesive, connected and playful team can achieve via Gamification.

8. Skills and Training: Large enterprises will look to invest in developing skilled resources in Gamfication design and development.

9. Gamification Services: Lack of experience with Gamification will drive increased interest in Gamification Consultants.
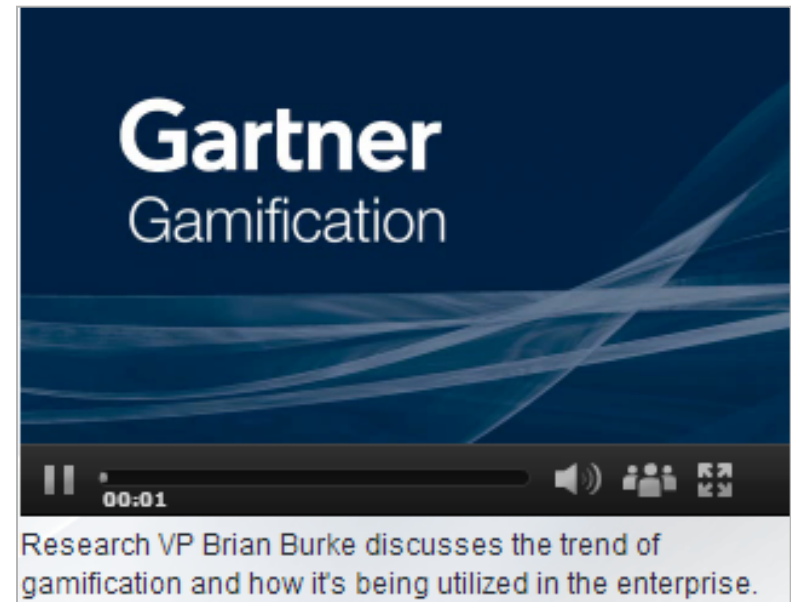
Gamification: - A Gartner Video

IT Security Trends

1. **Complexity Increases:** IT Security continues to become very complex, thanks to mobile, social, big data, and cloud trends.

2. **Mobile is a Target:** Hackers and criminals increasingly target Mobile Platforms, Mobile Wallets, and App Stores, causing CIOs ro allocate more resources towards securing Mobile Device Management and BYOD policies.

3. **Malware Sophistication:** Criminals target enterprise infrastructures with sophisticated malware at all potential endpoints.

4. **Cyber Wars:** Government and Terrorist-sponsored attacks increase on all institutions.

5. **Targeted Attacks:** Expect more targeted and coordinated attacks that are successful in disrupting service and fraudulently obtaining significant amounts of intellectual property.

"Worldwide spending on security is expected to rise to $60 billion in 2012, up 8.4 percent from $55 billion in 2011. Gartner expects this trajectory to continue, reaching $86 billion in 2016. " **— Gartner (**link**)**

"We are seeing more than ever how interconnected systems, poor policy enforcement, and human error is far more influential than any single security vulnerability." **— IBM (**link**)**

IT Security Trends (cont.)

6. **Cloudy Forecast #1:** Expect a few very large and public attacks on clouds.

7. **Cloudy Forecast #2:** CIOs look to Cloud-based Security Services for help.

8. **Security Automation:** Enterprises will invest in better security management facilities, the use of analytics and intelligence to identify trends and usage patterns, and the ability to monitor, report, and act on security intelligence.

9. **Security Leadership:** More enterprises will institute the Chief Information Security Officer role.

Top Security Trends and Takeaways for 2013 – Gartner Webinar (registration required)

Top Security Trends and Takeaways for 2013

Earl Perkins
Research VP
January 3, 2012

@GARTNER_INC

Gartner.

Corporate Sustainability & Green IT Trends

1. **Let's Talk About Carbon Again:** In 2013 political and business discussions around reducing carbon come off the backburner.

2. **Brand Reputation:** Lists like the Newsweek Green Rankings become more of a motivator for corporations as their brand reputation is a stake

3. **Greener Enterprise Data Centers:** Enterprises will actively pursue opportunities to mitigate supply-side energy risks and costs for new data centers.

4. **IoT for Sustainability:** New & innovative sensor networks will be employed help collect data and report on Sustainability progress.

5. **Analytics to the Rescue:** Big data and Analytics will be applied to Sustainability efforts helping organizations uncover detailed cost and energy usage insights.

"Large organizations, particularly those that are consumer-facing, have also felt the scrutiny of external stakeholders bringing pressure to bear to improve their sustainability-related performance." **– Gartner (**link**)**

"The worldwide market for green data centers will grow from $17.1 billion in 2012 to $45.4 billion by 2016 – at a compound annual growth rate of nearly 28%." **– Pike Research (**link**)**

Corporate Sustainability & Green IT Trends (cont.)

6. **Supply Chain Reporting:** In 2013, expect more large/ extensive supply chain ecosystems to adopt sustainability analysis and reporting.

7. **Collective Intelligence:** Expect more efforts at collaboration efforts between organizations, supply chain partners, peers, customers, and all stakeholders.

8. **Gamification:** Utilities employ games to keep individuals and businesses motivated do their part to contribute to Sustainability efforts.

9. **Cleantech Investments**: The glory VC days are behind Cleantech for now, but increasingly large companies will invest in Cleantech for their own efforts.

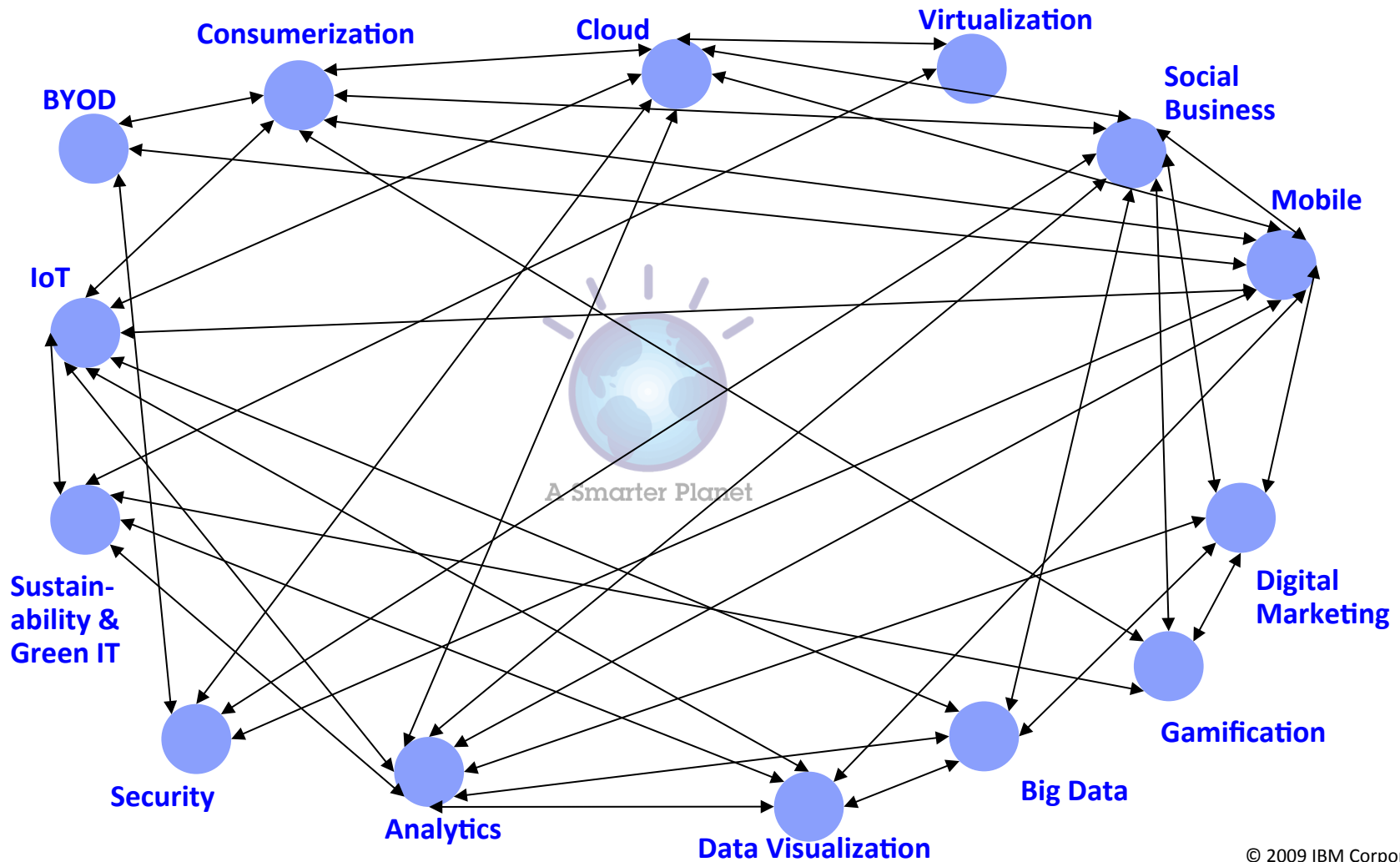A Green IT Approach to Data Center Efficiency, an IBM Redbook

A Green IT Approach to Data Center Efficiency

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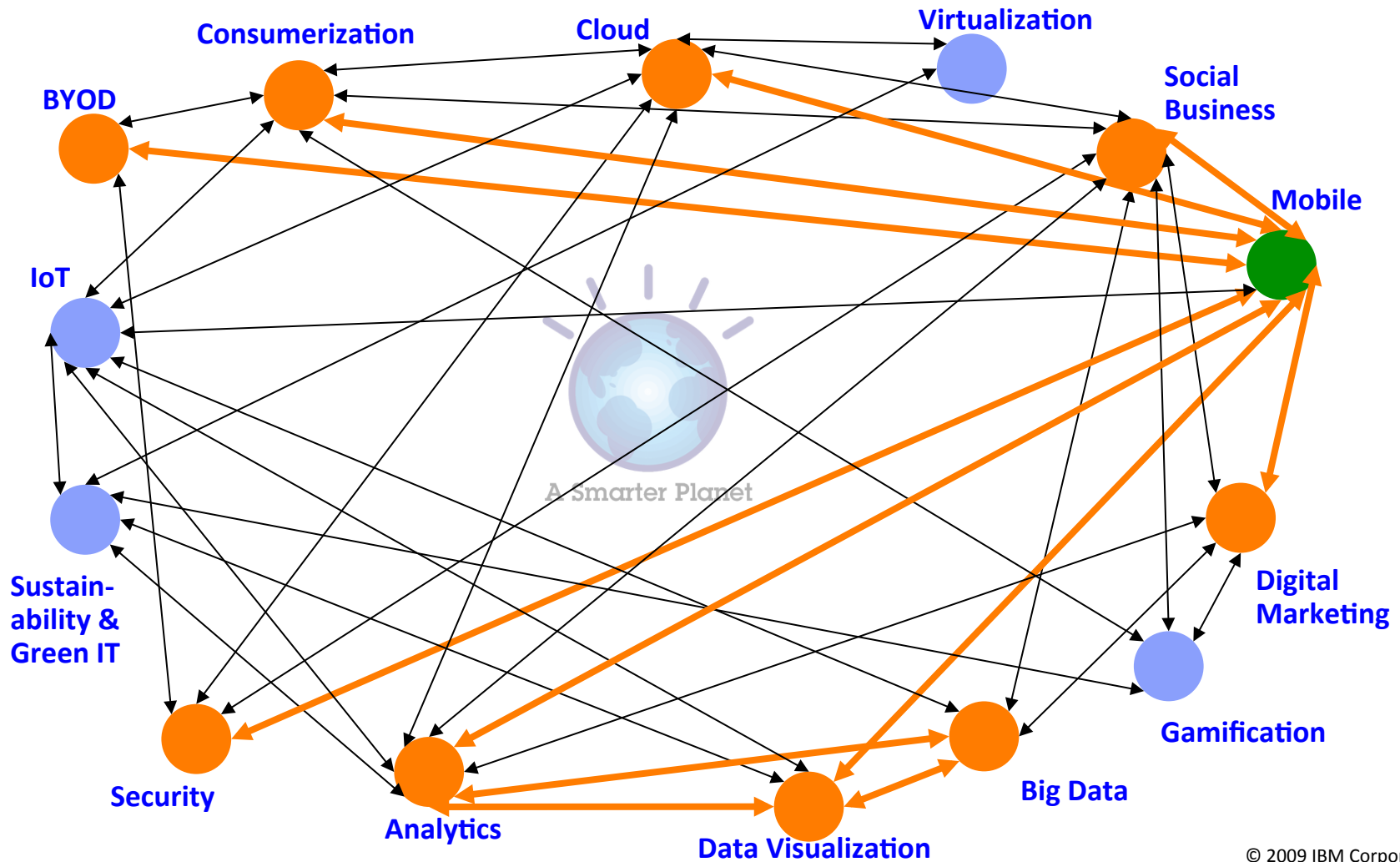IBM Academy of Technology

By Martin Ceron, IBM IT Architect

The trends interact tightly with each other shaping the future of enterprise computing

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Spring in the Enterprise Computing

CHALLENGES AND OPPORTUNITIES?

A 5 Year Historical View of HorizonWatch Top Trends to Watch Lists

2009	2010	2011	2012	2013
Virtualization	Desktop Virtualization	Virtualization	Virtualization	Virtualization
Cloud Computing	Cloud Computing	Private Clouds	Cloud Computing	Cloud Computing
SaaS				
			Big Data	Big Data
Analytics "aaS"	Business Analytics	Adv. Bus. Analytics	Analytics	Analytics
				Data Visualization
			IBM Watson	
Security		Risk Mgmnt	Security	Security
Mobile Apps / Services	Mobile Technologies	Mobile Computing	Mobile Computing	Mobile Computing
			Consumerization of IT	Consumerization of IT
				BYOD
		SOA		
Web Services	Mashups			
Embedded Intelligence				Internet of Things
	Green IT	Sustainability & IT	Sustainability/Green IT	Sustainability/Green IT
Unified Comm.	Unified Comm.	Social Business	Social Business	Social Business
Telepresence		Video-Enabled Business Processes		
		The Personalized Web		Digital Marketing
				Gamification
			Human – Computer Interaction	
	Storage/Server Trends	Storage Trends		
	Healthcare IT			