Innovation though collaboration

Working Together to Build a Smarter Planet

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IBM has 434,246 employees worldwide

24% of IBM’s revenue in growth market countries

IBM operates in 170 countries around the globe

100 Years of Business & Innovation

2012 Financials
- Revenue - $ 104.5B
- Net Income - $ 16.6B
- EPS - $ 15.25

More than 40% of IBM’s workforce conducts business away from an office

Number 1 in patent generation for 20 consecutive years; 6,478 US patents awarded in 2012

The Smartest Machine On Earth

5 Nobel Laureates

9 time winner of the President’s National Medal of Technology & Innovation - latest award for Blue Gene Supercomputer

“Let’s Build a Smarter Planet”

Innovation through collaboration
A legacy of world-class research

2011  Watson
2008  First Petaflop Supercomputer
2007  Web-scale mining
2006  Services Science (SSME)
2004  Blue Gene/L
2003  Carbon Nanotubes
1998  Silicon-on-Insulator
1997  Copper Interconnect Wiring
1997  Secure Internet Communication
1997  Deep Blue
1994  Design Patterns
1994  Silicon Germanium (SiGe)
1990  Statistical Machine Translation
1987  High-Temperature Superconductivity
1986  Scanning Tunneling Microscope
1980  RISC
1971  Speech Recognition
1970  Relational Database
1967  Fractals
1966  One-Device Memory Cell
1957  FORTRAN
1956  RAMAC
1948  SSEC
1944  Mark 1
Eras of Computing

Cognitive Systems Era

Programmable Systems Era

Tabulating Systems Era
Spent $19B in R&D and ~$12B for 35 acquisitions closed / announced since beginning of 2010
IBM Research: Leading in Key Technologies for Big Data

1. Context and Learning
2. Visual Analytics and Interaction
3. Software Defined Environments
4. Data-centric Systems
5. Atomic and Nano-scale
Entering a cognitive computing era

http://www.youtube.com/watch?v=WFR3lOm_xhE
## Capabilities of Cognitive Systems

### Cognitive Systems Era

<table>
<thead>
<tr>
<th></th>
<th>Watson 1.0</th>
<th>Watson 2.0</th>
<th>Watson 3.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
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<tr>
<td>Learning</td>
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<td>Judgment</td>
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<td>Perception</td>
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<td>Multi-modal</td>
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<td>Reasoning</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
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# IBM University Programs Summary

<table>
<thead>
<tr>
<th>Focus</th>
<th>Programs &amp; Initiatives</th>
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<tbody>
<tr>
<td><strong>Research</strong></td>
<td>- Shared University Research Awards (SUR)</td>
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<td>- Faculty Awards</td>
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<td>- Open Collaborative Research Awards (OCR)</td>
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<td>- Centers for Advanced Study (CAS)</td>
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<td><strong>Readiness</strong></td>
<td>- Academic Initiative Program</td>
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<td>- Smarter Planet/SSME/Cloud Computing/Analytics, etc.</td>
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<td>- Student Contests / Competitions (e.g., ACM)</td>
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<td>- Innovation Centers and Developer Relations</td>
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<tr>
<td><strong>Recruiting</strong></td>
<td>- PhD Fellowship Program</td>
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<td>- Various internships programs run by countries</td>
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<td></td>
<td>- Extreme Blue Internship Program</td>
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<td></td>
<td>- Great minds research internship</td>
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<tr>
<td><strong>Projects</strong></td>
<td>- Partnership Executive Program (PEP)</td>
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<td>- Public Private Partnerships/Emerging &amp; Growth Markets</td>
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<td></td>
<td>- Industry-Academic IP Collaboration</td>
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<td></td>
<td>- Corporate Citizenship and Corporate Affairs</td>
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</tbody>
</table>
IBM Academic Initiative

**Our mission**

- Partner with academic institutions to better educate millions of students for a smarter planet and more competitive IT workforce

**Our offerings**

- No-charge access to IBM technology & tools (*thousands* of software titles)
- No-charge access to course materials and curriculum (*hundreds* of modules)
- Skills enhancement supported by a worldwide community of IBM volunteers

www.ibm.com/academicinitiative
Our Mission: What is Smarter Planet?
Harmonized “service systems” waste less, innovate more

INSTRUMENTED
We now have the ability to measure, sense and see the exact condition of practically everything.

INTERCONNECTED
People, systems and objects can communicate and interact with each other in entirely new ways.

INTELLIGENT
We can respond to changes quickly and accurately, and get better results by predicting and optimizing for future events.

MANUFACTURING

IT

CUSTOMERS

WORKFORCE

SUPPLY CHAIN

TRANSPORTATION

FACILITIES
Our planet is a complex, dynamic, highly interconnected $54\text{ Trillion}$ system-of-systems (OECD-based analysis)

This chart shows ‘systems’ (not ‘industries’)
Economists estimate, that all systems carry inefficiencies of up to $15 Tn, of which $4 Tn could be eliminated.

This chart shows ‘systems’ (not ‘industries’).

Analysis of inefficiencies in the planet’s system-of-systems

System inefficiency as % of total economic value

Global economic value of

System-of-systems $54 Trillion 100% of WW 2008 GDP

Inefficiencies $15 Trillion 28% of WW 2008 GDP

Improvement potential $4 Trillion 7% of WW 2008 GDP

How to read the chart:
For example, the Healthcare system’s value is $4,270B. It carries an estimated inefficiency of 42%. From that level of 42% inefficiency, economists estimate that ~34% can be eliminated (= 34% x 42%).

Source: IBM economists survey 2009; n= 480
University: The Heart of Regional Innovation Ecosystems

- School of Urban Planning
- School of Public Policy
- School of Science & Arts
- School of Business Mngmnt
- School of Architecture
- School of Medicine
- School of Information
- School of Engineering
- School of Education
- School of Hospitality
- Incubator & Start-Ups
- Government Service to Individuals & Institutions
- Transportation
- Finance
- Energy
- Building
- Health
- Retail & Hospitality
- Cities & Public Safety
- ICT (Computing & Communications)
- Education

Innovation through collaboration
### Skills for 21st Century: T-Shaped Innovators

<table>
<thead>
<tr>
<th>Many team-oriented service projects completed</th>
<th>Many disciplines</th>
<th>Many systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>(resume: outcomes, accomplishments &amp; awards)</td>
<td>(understanding &amp; communications)</td>
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</tr>
</tbody>
</table>

- Many disciplines
  - (understanding & communications)
- Many systems
  - (understanding & communications)

Deep in one discipline
- (analytic thinking & problem solving)

Deep in one system
- (analytic thinking & problem solving)

SSME = Service Science Management Engineering (and Design)
Thank You