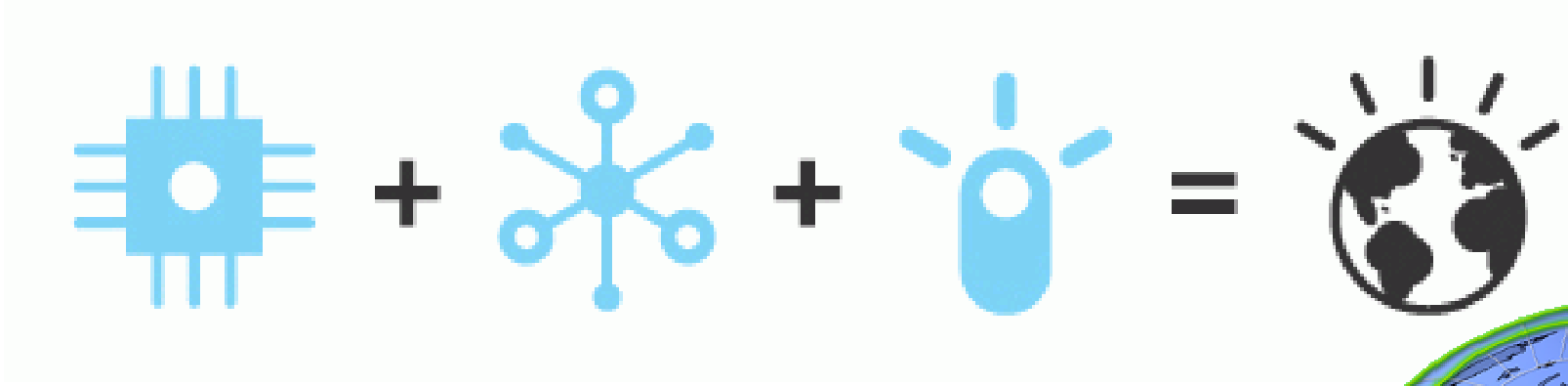
Report on IBM University Relations 2011
Plans for 2012



Education for Economic Development

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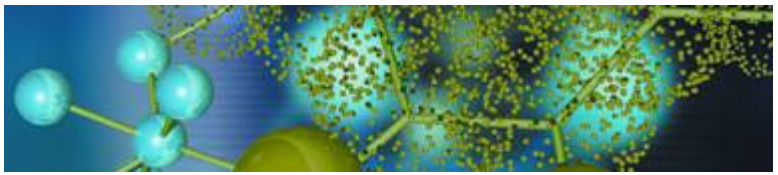
5 R's at AI: Research, Readiness, Recruiting, Revenue, Responsibility



Research: Advancing Science & Technology

Awards focus on grand challenge problems (IBM Focus Areas). Commitment to the development of new technologies, products, services and methods through extensive collaborations with public and private entities

Readiness: Building Skills & Experience

Deep relationships with universities with academic curriculum for 21st c. skills, joint projects, recruiting and development of students for the next generation of IBM researchers, developers and business people

Recruiting: Internships & Jobs

IBM recruits new employees from universities to create a globally integrated enterprise embracing different professions and perspectives.

Revenue: Transformative Solutions (P-P P)

Solutions for education based on IBM's world class services and technology, accelerating the transformation to a smarter planet – greater student success with smarter classrooms, smart administration, and innovation through research systems

Responsibility: Global Citizenship

Contributing to the communities in which we work, and programs for the environment, education and communities

IBM University Programs and AI Mapping & Partnership

Five R's	Programs & Initiatives
Research *Collaboration in areas of mutual interest & value to IBM*	❑ Shared University Research Awards (SUR) - **IIC** ❑ Faculty Awards (FA) ❑ Open Collaborative Research Awards (OCR) - **IIC** ❑ Innovation Grants on Smarter Planet (IG)
Readiness *Building the skills pipeline*	❑ Academic Initiative Program (led by SWG) – (**IIC**) ❑ **Smarter Planet/SSME/Cloud Computing/Analytics**, etc. (**IIC**) ❑ Student Contests / Competitions (e.g., ACM, BLA) ❑ **Innovation Center and Developer Relations** (**IIC**)
Recruiting *Acquiring top talent*	❑ PhD Fellowship Program (IBM ww) ❑ Global Recruitment Campaign (led by HR) ❑ Extreme Blue Internship Program (HR)
Revenue & Responsibility *Value creation, sales, and revenue generation, volunteering*	❑ Partnership Executive Program (PEP) ❑ Public-Private Partnerships / Emerging & Growth Markets ❑ Industry-Academic IP Collaboration ❑ Corporate Citizenship and Corporate Affairs (CC&CA)

UR / AI country results in 2011

ww recognition / academic awards / student training and certifications:

- "IBM Faculty Awards": 4 awards obtained by: Professor Valentin Cristea, Professor Adina Florea, Assistant Professor Alexandru Herisanu (CS Dept. of the University Politehnica of Bucharest) and Assoc. Professor Ecaterina Oltean (AII Dept. of the University Politehnica of Bucharest). Subjects:
  - *Service Orientation of Smarter Manufacturing with OpenEmbedded Linux Intelligent Products*
  - *Integrated system for network documentation and monitoring*
  - *A National Open Educational Model for Service Science, Management and Engineering Competencies*
  - *Intelligent Services for Smarter Cities*
- "IBM Ph.D. Fellowship" awards
  - Eliana Tirsa, CS Dept. of the University Politehnica of Bucharest, project "Advanced Techniques for Ensuring High Availability of Resources in Distributed Systems" (PhD Fellowship 2011-2012)
  - Marian Neagul, Mathematics-Informatics Dept., West University of Timisoara, project "Distributed Data Storage" (PhD Fellowship 2012-2013)
- Three 3-month "Great Minds" student internships at IBM Zurich Lab (from UPBucharest)
- One 3-month "Great Minds" student internship at IBM Research Lab in Haifa (from TUCluj-Napoca)
- EMEA Country Projects:
  - Cloud Computing for Higher Education in SSME – virtualization, cloud technology (IBM IIC)
  - Tivoli Service Automation Manager – hands-on training workshop (IBM Innovation Center)
- Student training and certification:
  - "Linux Administration (at UPB)
  - DB2 Academic Workshop, DB2.9 "Database and Applications Fundamentals" certification (at UPB)
  - "IBM Rational Software Architect" (at AICuza Iasi)

IBM HPC platforms for education and research in 2011

1. The INSEED project: Education in Service Science, R&D and KEE (IBM CloudBurst with Tivoli Service Automation Manager)

2. The GENIUS project: Energy as a Service and sustainable product design (IBM Green Data Center)

3. The GEEA Project: Centre of GRID multi-core high performance resources for research, technological development and innovation support at EU level (heterogeneous Grid structure)

4. Blue Gene / P Project: R&D on environment at the West University of Timisoara (IBM BlueGene P Supercomputer)

IBM Focus Areas 2012: FA, SUR, OCR, PhD programs

Smarter Business & Cities Services and software to improve business and organization performance	• **Intelligence & Analytics** (sensing, learning, natural language processing, cyber-physical systems, analysis and modeling of complex systems, financial transparency and regulation compliance, optimization, risk & integrity) • **Organizational Transformation & Service innovation** (healthcare delivery, green and service supply chains, energy and environment monitoring / modeling/ management, mobile delivered services, organization architecture and service design, service quality, virtual communities / social networks, model orchestration) • **Information management & analysis** (real-time/ real-world awareness, spatial-temporal data analysis, standards and security for urban information exchange, information based medicine/ healthcare management, intelligent transportation systems)
Smarter Infrastructure Hardware, software and services dynamically integrated into an open and secure computing environment	• **Deep computing** (BlueGene, visual analysis) • **Technology infrastructure** (green systems/data centers, rich user interface, intelligent embedded systems, event driven computing, middleware as a service, system complexity and security, IT enabled wireless infrastructures • **Virtualization** (hybrid systems, cloud computing, Internet-data centers)
Core Technologies	• **Computing technologies** (multi-core, co-processors (e.g., FPGA, PRISM, or GPUs on PCIe card) power management, nano, 3D-systems and integration, flash memory, micro-electronics, appliances) • **Energy technologies** (batteries,renewables, solar including photovoltaics, storage)

IBM Focus Areas 2012: FA, SUR, OCR, PhD programs

Game Changing Technology areas:

- Smarter planet / Smarter cities / Learning systems / Natural language understanding / Petascale analytics / Organizational transformation and service innovation / Healthcare transformation
- Social technologies / Internet of things / Urban information exchange
- Cloud computing, services, and new business models
- Multi-core, co-processors, and Hybrid /Workload optimized systems / Ability to package function as an appliance

2012-2013 Goldstine Fellowship (a new program)

Herman Goldstine

Goals:

- Research in mathematical and computer sciences
- Discover new potential members for the Research Center

Organizer:

- The Business Analytics and Mathematical Sciences Department of the IBM Thomas J. Watson Research Center

Audience:

- Candidates must have received a Ph.D. degree after September 2007 or should expect to receive one before the fellowship commences in the second half of 2012

Content:

- Areas of research: algorithms; data mining; dynamical systems and differential equations; high-performance computing ; numerical analysis; optimization; probability theory; statistics and supply-chain and operations management.

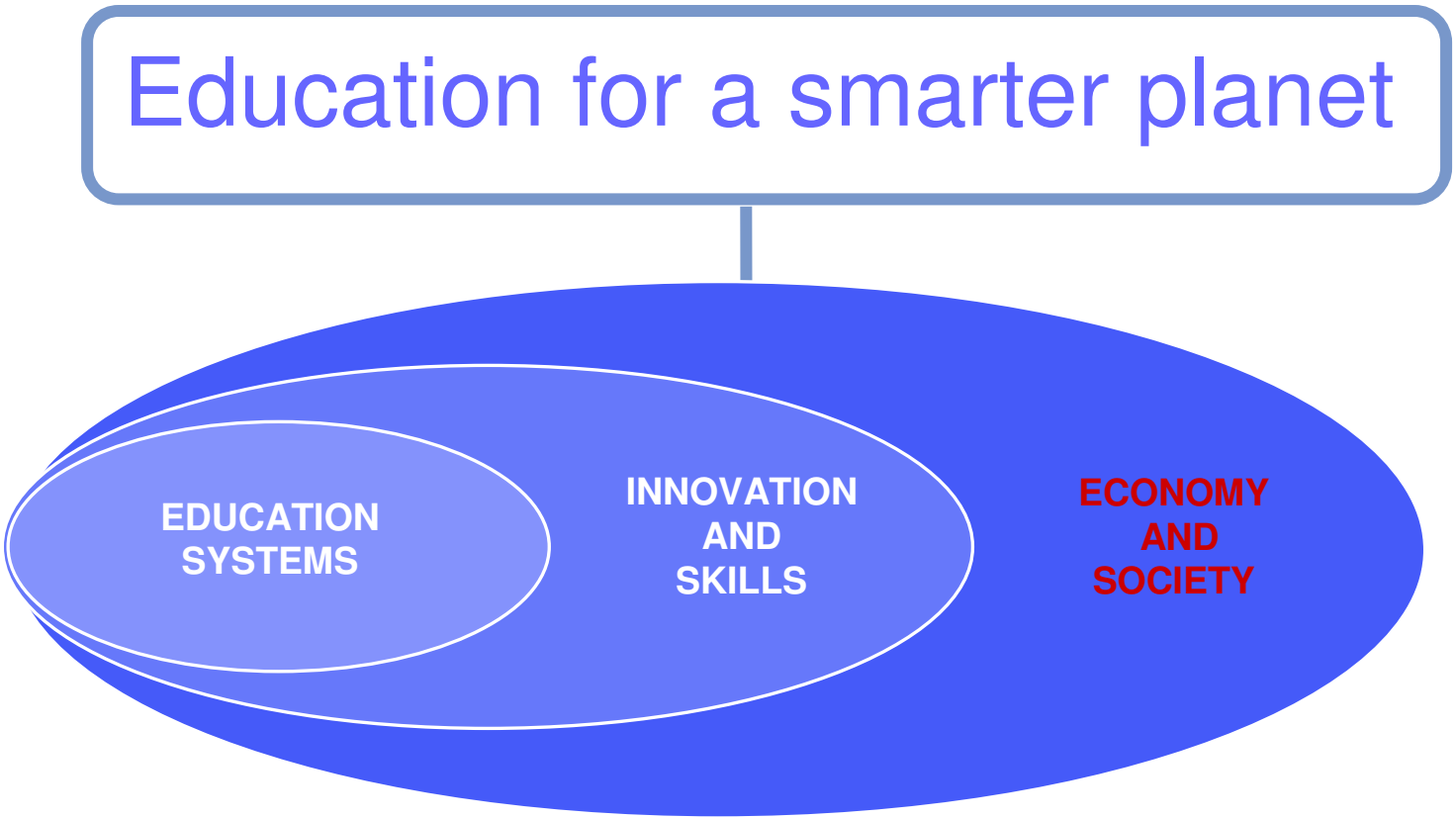
Operation:

- Applicants: fill in online application form by Jan 8, 2012 and furnish supporting materials at request (CV, abstract of Ph. D. dissertation, research statement, letters of recommendation)

UR Plans for 2012

- National Initiative for Cloud Computing Lab for Education and Research (cloud technologies, remote labs, KEE in Cloud, SaaS) – access to all universities; creating a network of skill with IBM IIC support
- Service Science education pilot (course content, laboratories, ontology, case studies)
- National program of training in XBRL (Extensive Business Reporting Language with IBM software IFSR) business and financial reporting, involving business and economic universities, schools & faculties
- Partnership in Analytics for Education – promote *integrated information systems* for universities with IBM hardware and software technology
- Student training and certification in IMB DB2.9 for IM
- Introducing IBM's Manufacturing Integration Framework MSB2.0 SOA approach and methodology as support in system engineering, AI & Applied Informatics specific courses (via Cloud) – SOA in manufacturing and automation systems

Engaging to build on a vision of cloud computing for education



By investing in education, the positive impact will be felt far beyond the classroom – **education for economic development**

The IBM solution is …

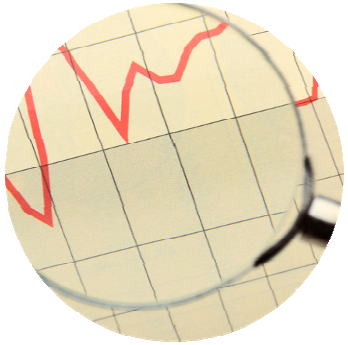
Analytics for Education

… based on cloud services

The Education Community Faces New Challenges Everyday

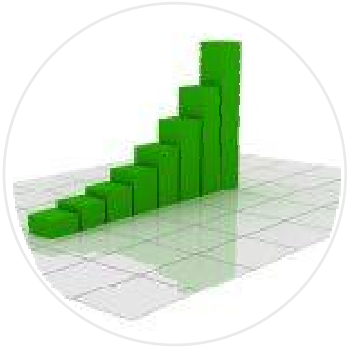
Increasing Student Success

Continuing Budget Pressures



Lack of Decision-Quality Information

Managing the Business of Education



Demands for Accountability & Transparency

…and Silos Often Persist That Impact Outcomes

Operations

Budget & Finance

Workforce/ HR

Tuition & Enrollment

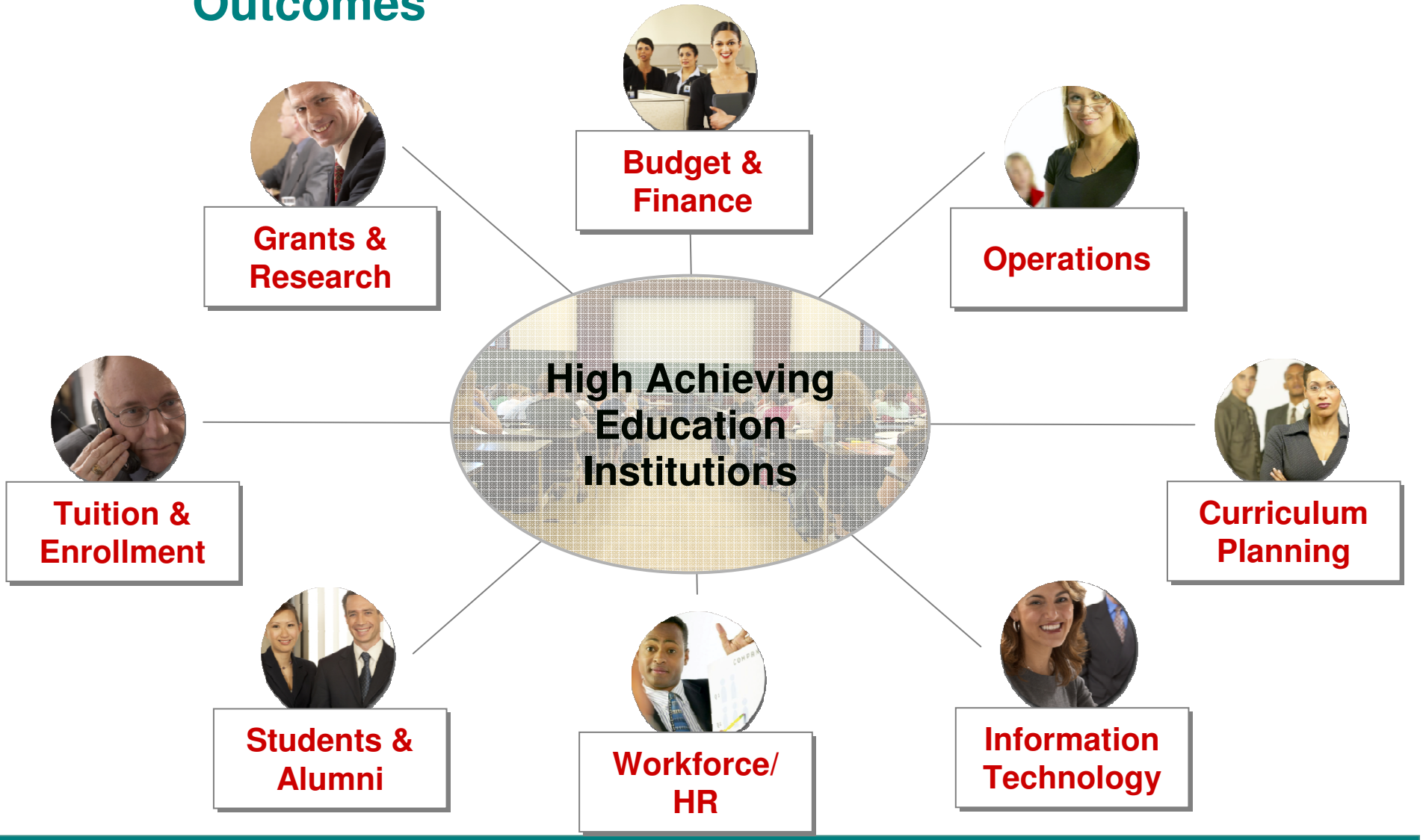
Curriculum Planning

Information Technology

Grants & Research

Students & Alumni

Removing Silos Leads to Better Performance & Better Outcomes

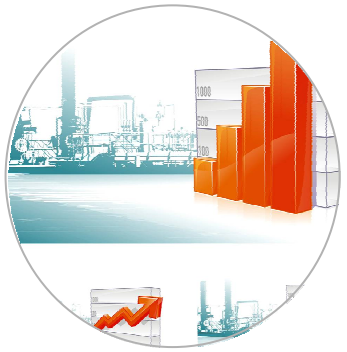


Analytics Helps Manage & Improve Performance for Better Outcomes

Mission Performance

Academic Performance

Financial Performance



Operational Performance

- Mission, financial and operational aspects define the education institution's imperatives.
- From those imperatives, *measurable goals and objectives* are developed that measure outcomes.
- Analytics helps to *manage the outcomes* required and demanded for and by students, faculty, parents.

Analytics for Education

Mission Performance

Academic Performance

Financial Performance

Operational Performance

- Complete view of students, faculty, curriculum, programs, operations and budgets
- Manage and reduce risk
- Improve operational efficiency
- Ensure transparency
- Drive the best possible outcomes

Informed, Aligned Decisions and Actions

Budgets & Finance

Grants & Research

Operations

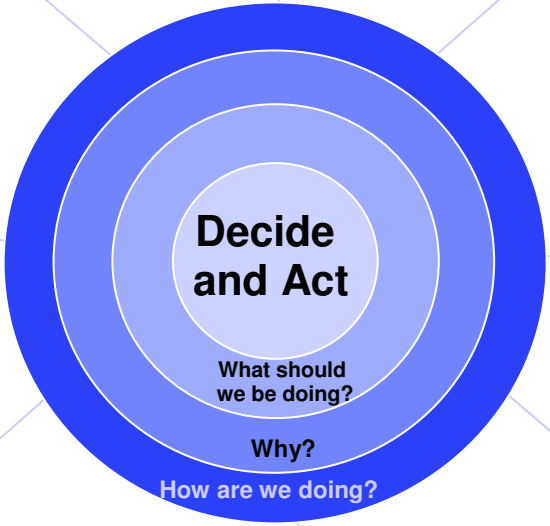
Tuition & Enrollment

Curriculum Planning

Students & Alumni

Information Technology

Workforce/ HR



IBM Analytics for Education Value Proposition

IBM Analytics delivers **actionable insights** for **decision makers** at all levels of your university, enabling them to **optimize** business and academic performance

IBM is betting big on analytics...

Cognos & SPSS have long been a part of academia

- IBM sees strong growth in its analytics initiatives. IBM's **analytics development continues to grow**
- From 2008 to 2010, IBM has invested more than **$14 billion in 24+ acquisitions to expand its analytics capabilities.**
- As part of IBM's Business Analytics and Optimization service line, there are more than **7,800 dedicated analytical business consultants**
- More than **200 IBM mathematicians focus exclusively on analytics**.
- To date, IBM has received nearly **500 analytics patents**.
- Since inception (2004) the **IBM Academic Initiative** has served **45,000 faculty**, covering **10,000+ institutions**, teaching **100,000 courses**, to **2.7M+ students**

IBM Analytics for Education Performance Management

IBM Cognos education performance management helps data-rich, education organizations harness the full potential of their data.

- By streamlining the reporting and analysis process, Departments of Education, R&D Centers and schools can create multi-variable reports with consistent data all from one data storage system.
- A balanced scorecard will aid education organizations in mitigating the multiple factors that impact targets and goals.
- Budgeting and planning allows Departments of Education, R&D Centers and schools define, model, coordinate, and adjust targets and goals.

IBM Analytics for Enrollment and Tuition Planning Performance Blueprint (IBM Cognos)

- Analyze enrollment trends, history and projections.
- Produce dynamic reports with hierarchical drilling capability from summary to detail, such as the profitability of a single class
- Create efficient and rapid changes across all levels.
- Provide a collaborative application with narrative ability.
- Plan for an entire year with the ability to submit modification.
- Perform “what-if” modeling and scenario analyses to compare alternatives

IBM Analytics for Salary Planning and Position Control Blueprint

- Track faculty salary and funding sources.
- Understand the total cost of individual trainers including benefits and lump sum payments.
- Determine when funding sources are going to change or run out and how to replace them.
- Plan compensation updates and changes.
- Determine headcount needs.
- Develop salary and position funding plans that are aligned with current and long-range academic program requirements
- *IBM Cognos Salary Planning and Position Control Performance* Blueprint

IBM Analytics for Student and Teacher Performance

Gain a complete view of student and the school to track all academic, financial and operational requirements and threats to student achievement and success.

Improved student performance

- Manage student and teacher performance at the individual level
- Identify students at risk before they drop out
- Manage student curriculum at the individual level for enhanced learning.

Stronger fiscal oversight

- Manage budgets collaboratively across the enterprise
- Reduce costs through deeper insight into spend and funding information

Streamlined operations

- Consolidated view of operational requirements across the enterprise for greater efficiency

For more information: http://www-01.ibm.com/software/analytics/education/

IBM Analytics for Instructional Intervention Plans in Education

Using instructional case management capabilities to help identify students at risk of not succeeding and track intervention programs

Early Warning System

- Delivers optimized case outcomes through analytics, rules, collaboration and social computing
- Leverage historical data and “what-if” analysis to recommend interventions and actions based on a student’s likelihood of success
- Manages & governs the entire case lifecycle

Improved Student Attainment

- Early identification of at-risk students with score-carding, reporting, and analysis
- Development of interventions based on individual learning styles
- Ability to track assessments and progress
- Improves teacher productivity and success rate in managing at-risk students

For more information: http://www-01.ibm.com/software/data/advanced-case-management/

IBM Analytics for Finance and Operations in Education

Business Analytics Help Manage & Improve Performance for Better Outcomes

A Roadmap to Managing Performance on Campuses

- Mission, financial and operational aspects **define the education institution's imperatives**
- From those imperatives, measurable goals and objectives are developed that **measure outcomes**
- **Business Analytics helps to manage the outcomes** required and demanded for and by students, faculty, parents

Business Analytics Provides:

- Complete view of students, faculty, curriculum, programs, operations and budgets
- Manage and reduce risk
- Improve operational efficiency
- Ensure transparency
- Drive the best possible outcomes

For more information: http://www-01.ibm.com/software/analytics/education/

IBM Analytics for Decision Management in Education

Gain a complete view of students and teachers to understand and predict the need for intervention to ensure student success.

Student performance analytics

- Analyze surveys and modeling to identify drivers of student behavior and identify key performance predictors (KPPs), including student retention and recruitment.
- Better predict the outcome of student actions—drop out, performance interactions.

Teacher performance analytics

- Identify drivers of teaching behavior via survey analysis and modeling as well as KPPs for student learning success.
- Better predict the outcome of teacher actions and teacher performance.
- Target teachers for additional training to improve results.

Decision Management in Education

Six Ways to Success

Want to Learn More about this solution?

Cloud Computing provides the infrastructure for transformation

Smarter Classroom

Enabling student success and skills

Smart Administration

Optimizing educational systems

Innovation in Research

Accelerating innovation

Cloud Computing

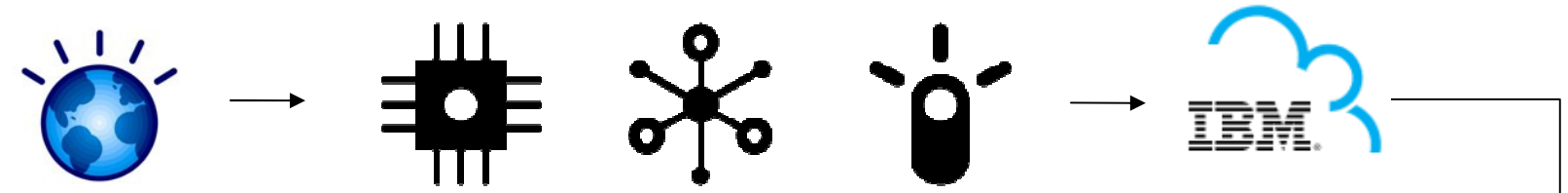
Consumer Devices | *Emerging Technologies* | Open Platforms

Enabling Strategies

Interoperable Processes | Aligned Data | Shared Services

Putting it together…positioning guidance & context

IBM Cloud & Academic Initiative conversation roadmap



The world is changing

It's becoming increasingly instrumented, interconnected and intelligent

IBM views cloud computing as an emerging paradigm for delivering and consuming IT based services

New Cloud offerings, like IBM Development and Test Cloud present new opportunities to expedite service delivery of software used to teach IT skills at universities through a highly automated, highly virtualized, very dynamic, and flexible self service cloud environment.

Academic Initiative: partnering with faculty to build skills for a smarter planet

Access to software & courseware via traditional download catalogs

Academic Skills Cloud

Access to development software via **new cloud offering**

Thank you and any questions?