



IBM's Role in Creating the Workforce of the Future

Executive Summary

IBM was one of the first technology vendors to partner with universities and other organizations to educate the type of IT professionals required to build, run and optimize the types of IT infrastructures and solutions that became the foundations of 20th century organizations.

Although the vendor is certainly continuing with its IT-focused efforts, technology has become an integral component of all organizational functions and processes. It is, therefore, no longer sufficient to educate a small percentage of knowledge workers to become IT professionals. As discussed extensively in [Tom Kucharvy's blog](#), IT professionals must now understand business needs and all knowledge workers must understand how IT and other tools can be used to enhance their own work. IBM, therefore, has shifted its primary university collaboration and internal employee development efforts away from educating deep, but narrowly-focused specialists, to create a new type of 21st century knowledge professional—what IBM calls a “T-shaped person.”

These T-shape people—whether IT professionals, business professionals or public service professionals—must be interdisciplinary, rather than narrowly-focused specialists. Although they must certainly have deep skills in a specialty (the vertical axis of the T), they must also have sufficient understanding of a broad range of related disciplines (the horizontal axis) to allow them to see contextual linkages, to constructively participate in interdisciplinary teams and to continually adapt their visions and their contributions to rapidly changing conditions and needs. But whatever an individual's specialty (whether computer science, engineering, marketing, finance or any other field), all must understand how to apply IT tools to the needs of their profession.

Therefore, IBM is adapting how it works with universities to leverage its traditional relationships with IS, engineering and business departments, into all types of disciplines—from psychology, through public affairs through medicine. These new relationships are multi-faceted, including everything from help in designing courses and curricula; providing required hardware and software; funding research, scholarships and internships; and helping to create interdisciplinary research centers that bring together academics, businesses and government officials to address gnarly problems in areas including healthcare, transportation, energy, food safety and environment.

IBM's initial goal in creating T-shaped professionals and research centers is to feed the company's own need for qualified people. It selects future employees from among this expanded pool of graduates and is adapting the company's internal employee development programs to transform these interdisciplinary graduates into solution-focused professionals who can proceed through any of five broad IBM career paths.

But if these efforts go as anticipated, they will accomplish much more. They will help promote independent research that is aligned around IBM's primary market objectives, provide solution-

focused employees for IBM customers and partners and, ideally, inspire a new generation of students to understand how they can use IT (ideally IBM's IT) to bring new value to their own fields. Ideally, many of these fields will align with the rapidly expanding sets of market needs IBM is addressing under its Smarter Planet initiative.

Key Points

IBM is expanding and refocusing its Academic Initiatives.

It is leveraging its current efforts around preparing information science, engineering and business students to helping all types of academic disciplines more effectively apply IT tools to their own requirements.

IBM's goal is help promote the creation of T-shaped people.

These graduates have deep skills in their chosen discipline, broad understanding of a number of complementary fields and complete familiarity and comfort in using IT to address their needs.

IBM's Academic Initiative has three primary goals, and multiple secondary goals.

Its primary goals are to help shape students' education, to help recruit the types of students IBM will need, and to help align university research around IBM's objectives. Secondary benefits include engagement with universities in the design and promulgation of business and government solutions and the creating of recognition and good will among potential IBM customers.

IBM is complementing its university program with enhancements to its employee development programs.

Once hired, every employee creates a custom self-directed career path, and gets access to career coaching and to a tool that recommends and delivers educational materials. The company, which spends about \$600 million per year on employee development, is increasingly structuring assignments and career paths in a way that will develop each employee's T-shaped skills.

These efforts have the potential of yielding many indirect benefits to customers, partners and IBM.

They can help create a new generation of IT-savvy, solution-focused recruits for customers and partners, spur research around key market needs, and dramatically expand the visibility around and utility of IBM Smarter Planet initiatives.



IBM's Role in Creating the Workforce of the Future

Table of Contents

Introduction: Smarter People for a Smarter Planet	1
Section One: The Evolution of IBM's Academic Initiatives	3
Section Two: The Growth of Interdisciplinary Education Initiatives	5
Section Three: Employee Recruitment, Development and Training	7
Section Four: Implications and Opportunities	10
Reports by Author Tom Kucharvy	14
Figure 1: IBM's Entry Employee Hiring by Role.....	8
Figure 2: IBM's Academic Initiative Benefits Six Constituencies	11



IBM's Role in Creating the Workforce of the Future

Introduction: Smarter People for a Smarter Planet

IBM has a history of identifying the type of people that it, its partners and its customers will need in the future, and then in working with universities and other partners to ensure the availability of these people. Back in the 1950s, when IBM was seeking to ensure the availability of professionals capable of driving adoption and utilization of IBM mainframes, the company, both directly and through organizations like the Association for Computing Machinery (ACM), partnered with universities to create Information Science curricula and courses. These efforts, combined with similar actions by dozens of other IT vendors and organizations, spawned generations of professionals that have been instrumental in establishing IT as a critical foundation of virtually all 20th century organizations.

Relationships between IT vendors and universities have dramatically expanded over the last 6 decades and have matured into a series of mutually beneficial teaching, recruitment, research, and, in some cases, even sales relationships. IBM and other vendors will continue to expand and enhance their relations with university Information Science and Electrical Engineering departments as highly-trained IT specialists will always be needed.

Changing IT Educational Requirements

IBM, however, now sees a need for a new form of IT education—an education in which IT is not the focus of a deep, specialized curriculum, but where it is one of a range of core, interdisciplinary, horizontal skills that complements deep vertical expertise in another field. As explained by Dan Reed, Vice Chancellor for IT at the University of North Carolina, this new focus is where IT becomes “the liberal arts for the 21st century”—a set of IT skills, for example, that allows a marketer to seamlessly integrate analytics into an examination of customer behavior or a biochemist to sequence DNA. IT, in other words, becomes one of a broad set of interdisciplinary skills, like communications, teamwork and cross-cultural sensitivity, that will be required to thrive in any chosen discipline.

True, the vast majority of Millennials are already highly comfortable with—and highly competent in—using all type of digital tools. However, while knowing how to use these tools is necessary, it is not sufficient. They must also know how to apply the tools to real-life business needs.

IBM Academic Initiative is a program targeted at addressing these higher-level requirements. For example, it is adapting its educational outreach programs, its recruiting efforts and its employee development initiatives to facilitate the education, hiring and career development of what it calls “T-shaped” people, those with deep skills in a particular discipline, but enough of an understanding of complementary fields to understand concepts, appreciate requirements, recognize patterns, adapt to change and constructively contribute to interdisciplinary dialogs and teams. This type of interdisciplinary education has the potential of helping:

- Individuals develop skill sets that will deliver greater business value to employees while simultaneously combining traditional left-brain analytical capabilities with right-brain synthesis skills in a way that will more effectively differentiate their skills in a global economy; and
- Universities educate students in the type of skills that will be increasingly required to win and strive in tomorrow's high-value jobs, while simultaneously allowing the universities to develop the type of interdisciplinary research centers that will more effectively differentiate their curricula.

Win/Win Opportunities

This program has the potential of helping students, professors, universities and IBM itself. It will, for example:

- Allow the company to reach many more students in many more academic departments than was previously possible;
- Help professors enhance their courses and provide them with more opportunities to partner with IBM on joint research initiatives;
- Enable universities to better prepare their students for attractive jobs; and
- Provide IBM with a larger pipeline of potential employees that have the types of backgrounds for which the company is looking.

Of even greater importance, the program ultimately has the potential of seeding IBM customers (corporations, governments, start-up companies, as well as universities themselves) with professionals that see the world in the way that IBM sees it and that have a favorable view of the company. This can be instrumental in helping IBM build a market for some of the vendor's most critical, differentiating initiatives, including:

- *Smarter Planet*, in which current infrastructures and processes are transformed by instrumenting, interconnecting and adding intelligence to them (<http://www.ibm.com/ibm/ideasfromibm/us/smartplanet/index.shtml>);
- Service Science, Management and Engineering, in which all types of service processes are systematically reengineered (as manufacturing processes already have been) to make them more standardized, repeatable and efficient (<http://domino.research.ibm.com/comm/research.nsf/pages/r.servsci.html>); and
- Business Analytics and Optimization, in which software is used to sift, analyze and extract accurate and actionable business intelligence from huge data stores (http://www-935.ibm.com/services/us/gbs/bus/html/bcs_centeroptimization.html).

In other words, IBM's new interdisciplinary academic and workforce development initiatives are intended to do for the IBM of the 2000s, what its Information Science initiatives did for the IBM of the mid-1900s.

This report examines how IBM is working with universities to create these new curricula, bring new skills into the company and develop its employees' skills to most effectively capitalize on the opportunities of the 21st century. It briefly summarizes IBM's traditional university-based IT educational programs, drills down into its new interdisciplinary initiatives and assesses how these programs are likely to feed and reshape the development of IBM's own talent pool. It then suggests how these efforts may play out in the market and the implications for IBM customers, partners and competitors.

Section One: The Evolution of IBM's Academic Initiatives

IBM is far from unique in its work with universities. Although IBM was one of the first, virtually all leading technology vendors now have academic initiatives in which they seed universities with their hardware and software, work with professors to develop classes for teaching their products, engage professors in joint research projects and recruit students. IBM, like other vendors, is extending the scope and reach of its own university technology education programs through means including new courseware, delivery models and engagement programs.

Evolving Tools

IBM's university Academic Initiative program is targeted primarily at helping all types of higher education institutions—from community colleges through leading research universities—educate information science and, secondarily, business students, on IBM products. It provides big discounts on or free access to IBM hardware; free downloads of IBM software and courses; free access to newsletters, videos, case studies and product roadmaps; and an academic version of the sandbox, in which professors can test and provide feedback on new IBM technologies.

It produces instructor-led and self-paced courses, online testing and certification programs. IBM is rapidly adapting this program to accommodate how today's students wish to learn. It provides downloadable courses, community portals and wikis for information access; discussion forums and blogs for communications; and communities around Facebook, Twitter and other social networking tools. It has even begun to use gaming, as with its interactive, 3D INNOV8 Business Process Modeling (BPM) simulation game. It is encouraging and helping schools and professors move toward more student-led (in addition to traditional instructor-led) programs, adopt interactive distance learning systems and use IBM tools to create virtual learning environments and simulation tools. The company is also providing closer direct links with students through scholarships, fellowships, internships and summer jobs.

Although IBM develops most of these courses itself, it also works with a broad range of third-party partners. Partners include:

- *Professors*, to adapt IBM courses (such as for Websphere) for use in their classes and to demonstrate how IBM technologies (such as Blue Gene) can be used to address real-world problems;

- *Corporate customers*, to help local universities produce graduates with required skills such as working with the University of Arkansas to teach the types of mainframe skills required by Wal-Mart;
- *Complementary vendors*, such as Google, with whom it is co-developing university programs to teach the requirements for developing for new, open, cloud-based environments;
- *Professional organizations*, such as ACM with whom it adapts IBM courses in accordance with ACM curricula; and
- *Industry consortia*, such as the Service Research & Innovation Initiative, to which competitors including HP, Oracle and Microsoft belong.

But for all the help that IBM provides universities through access to free hardware, software and courseware, the greatest value is arguably provided by the company's 4,000 University Ambassadors. These ambassadors, who come from all parts of IBM, are often domain experts. They seek to engage and stimulate the passion of faculty members, help them tailor courses to real-world needs, and seamlessly weave IT and related disciplines into the fabric of these curricula.

Although the company has a core of about 400 ambassadors that focus full-time on University engagements, the vast majority of its ambassadors are volunteers that have full-time assignments in other fields. These part-time ambassadors may consult with professors around particular technologies and course designs, engage with individual schools, or teach courses at partner universities. Close to 800 of these people, for example, serve as adjunct professors or lecturers.

Evolving Focus

Although the primary focus of IBM's university program is skills development, the program actually has three primary legs:

1. *Skills development*, particularly around IBM products and key technology trends (such as SOA and cloud);
2. *Research*, as where IBM Research or product groups enlist and fund professors and graduate students around R&D initiatives such as cloud computing, high-performance computing and SOA; and
3. *Recruiting*, in which IBM attempts to identify particularly promising students and recruit them for careers at IBM.

While most of IBM's university programs are targeted primarily around IT initiatives, it has adapted many of its courses for use by business schools. Its INNOV8 BPM game, for example, is targeted primarily at business professionals and students, rather than IT. The company also engages with and funds professor research in areas ranging from mathematics (such as in advanced simulation and modeling), business (as around disciplines like supply chain management and new business models and practices), physical sciences (in areas ranging

from pandemic tracking to solar cell development) and social sciences (such as psychology and economics).

Section Two: The Growth of Interdisciplinary Education Initiatives

Although IBM has reaped big rewards from its traditional university efforts the company recognizes that market needs and industry requirements are changing. For example:

- Customers are increasingly demanding that IT solutions deliver true, demonstrable business value;
- Services is becoming the dominant sector of most country economies and is creating new opportunities to create “service systems” that make these services more repeatable, reliable and efficient;
- The number and percentage of developed-country students that major in technical disciplines, such as science, technology, engineering and math (what we collectively refer to as STEM), is declining, while those in emerging countries is growing; and
- Technological advancement is continually changing the requirements of knowledge work, as by increasingly automating some traditionally manual tasks (such as application development) and by providing tools that enable new skills (such as statistical modeling of Web traffic and data analytics).

New Skills Requirements

IBM is responding to these changes in multiple ways. It is increasingly linking its technology to pressing business and societal needs (as with its Smarter Planet initiative), focusing more work on tools to enhance services functions (as with its work on Service Science, Management and Engineering, or SSME), changing the way it presents technical information to students (as in using Smarter Planet to show students how they can apply technology to make a difference in their chosen field and in society) and expanding its engagement with universities in emerging countries.

These initiatives require increasingly interdisciplinary, T-shaped people—individuals that combine critical thinking, creativity and innovation with leadership, global awareness and technology literacy. IBM, therefore, is urging and helping universities move beyond traditional silo-based focuses—where they seek to educate and graduate specialists—to actively encourage and support truly integrated courses of study.

Students, for example, must have a deep understanding of specific industries or business processes, along with software engineering skills to create effective service systems. They must understand Web-based design and statistical modeling to tune Web-based delivery systems to the particular needs of individual customers. They must, however, understand these not as discrete disciplines, but understand how to use the tools of one discipline to address the needs of the other.

IBM also hopes and expects that the benefits that can be delivered through initiatives such as Smarter Health Care, Smarter Cities and Smarter Food Systems will inspire aspiring healthcare professionals, urban planners and biologists to study the type of IT and mathematics disciplines that will be required to deliver on Smarter Planet promises. Such combinations, IBM claims, will allow graduates to address pressing needs within their own communities, such as by helping to create safer, more efficient healthcare and transportation systems.

IBM as Academic Catalyst

IBM built its first major cross-disciplinary university initiative around Service Science, Management and Engineering. It is currently working with more than 250 universities worldwide to design courses that combine disciplines including computer science, operations research, engineering, management science, business strategy, and social and cognitive sciences. While many of these 250 schools currently support SSME courses and, increasingly, full curricula and degree programs, about 40 have gone much further. Schools including Carnegie-Mellon, MIT and North Carolina State have created truly integrated curricula and inter-departmental SSME research initiatives in which management, engineering and related academic disciplines are focused specifically on enhancing services processes.

Smarter Planet has even greater interdisciplinary requirements. For example, IBM is currently helping universities develop “Smarter City” curricula that combine disciplines including business, IT, civil engineering and urban planning. It is similarly helping them develop courses to educate students to apply sophisticated analytics to all types of business needs, from protein folding to supply-chain optimization. IBM may work directly with professors to build such program. It may also work indirectly, for example, by funding the work of a professor that is looking to create a course around medical records management, by providing access to IBM Global Business Services medical consultants or by inviting IBM partners and/or customers to help in course design and/or delivery.

Developing courses and curricula, however, are only steps toward IBM’s real goal of helping universities create truly integrated, truly interdisciplinary Research Centers, in which professors and leading students from multiple disciplines come together to jointly address broad, real-world needs. Some, such as University of Arkansas’ Radio Frequency Identification (RFID) and Supply-Chain Optimization Research Centers, are aligned closely with specific local companies (in this case Wal-Mart). Others, like the University of Michigan’s transportation center and University of San Diego’s water management center focus on the needs of industry clusters and regions. Others, such as Carnegie-Mellon’s cybersecurity and MIT’s nanotechnology research centers, tend to focus on broad, cross-industry, foundational technologies. All, however, engage professors and students with companies and governments looking to address pressing, real-life needs.

Although most such efforts are focused on helping multiple groups within individual universities to address common needs, some of these initiatives span multiple universities. Some universities, for example, may partner in developing courses or research centers and many of the courses that are developed under IBM grants are available to other universities. Such collaboration can also cross borders. For example IBM is helping to connect faculties of developing-country universities with those of counterparts in developed countries that are working on similar issues, such as in energy management and food production.

Creating a Win/Win/Win

Such efforts have the potential of helping all parties. They can, for example:

- Help professors and universities better tailor their curriculum and research to real world needs;
- Provide students with more practical, real-world training and give them a chance to learn from and intern with potential employers; and
- Allow corporations to gain access to more students and build a larger pool of qualified talent from which they can recruit.

And don't forget the benefits these efforts deliver to IBM. It allows the company to engage more closely with multiple departments, capture the attention and imagination of professors, get more students trained on IBM products and burnish IBM's reputation as a thought leader and potential employer. It can, in other words, help IBM achieve all four of its Academic Initiative goals—develop skills that will be required by IBM and its customers, improve IBM's recruiting position, spur universities to conduct research around IBM initiatives and, thereby, indirectly help “sell” IBM Smarter Planet offerings by lending credibility to and adapting IBM solutions to the needs of its customers.

Section Three: Employee Recruitment, Development and Training

For all the benefits that IBM's Academic Initiative delivers, the most direct, and most immediate, are in providing IBM with a large stream of potential employees with the skills that IBM requires.

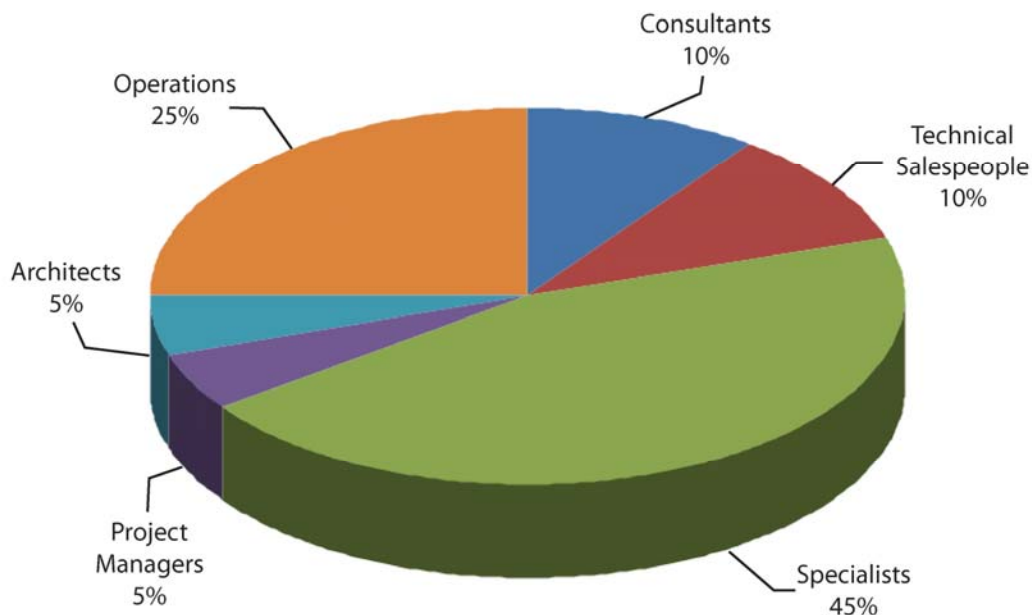
Recruitment

As mentioned, IBM leverages its university engagements to identify, engage and, in the case of internships and fellowships, “test drive” students for potential employment. It assesses candidates on the basis of factors including foundational competencies (including communication skills and teamwork), breadth of interests and contextual capabilities (the horizontal part of the “T-shaped skills”), intellectual curiosity and, of course, specialized training and aptitude for the particular job for which they are being hired (the vertical part of the “T”). These jobs typically fall within one of six categories (see Figure 1):

1. Consultants, who account for about 10% of IBM's 400,000-person workforce, model business processes, identify customer objectives and priorities, and build value propositions around customer objectives;
2. Technical salespeople, about 10% of its workforce, show clients what is required to achieve these objectives;
3. Specialists, about 45% of its workforce, provide in-depth skills in all types of disciplines. Roles may include programmer, software engineer, data analyst, call center agent, scientist and so forth;

4. Project managers, about 5% of employees, align and manage the resources required to deliver solutions to customers;
5. Architects, about 5% of the workforce, work with consultants and technology salespeople at the beginning of the process to define solutions, and then with project managers and delivery specialists during the implementation phase, to ensure that the project delivers the intended benefits; and
6. Operations people, the remaining 25% of employees, with roles including financial analysts, lawyers and administrators.

Figure 1: IBM's Entry Employee Hiring by Role



Source: Beyond IT, Inc. (based on information from IBM)

Employment Development

Once IBM employs these recruits, their real education begins. IBM has hired an average of about 40,000 people annually over the last five years and is dedicated to employee development. Every one of its 400,000 employees has a career framework, with milestones and goals tailored to their unique roles, skills and objectives, and IBM spends about \$600 million (about \$1,500 per employee) per year helping employees develop to their potential.

Every employee who enters the company or a new job is provided a skills taxonomy that outlines the requirements for success in each of the company's 350 "job roles" plus the requirements for progressing up through five competency levels (from "entry" through "thought leader") for each of these roles. They are then provided self-assessment tools to determine which skills they most need to develop (an assessment which is verified by the employee's manager and peers) and the company's Learning@IBM Explorer application that lists all of the learning assets (text, virtual classes, seminars, etc.) available to develop the skills on which they wish to focus.

Each employee can also select among different career tracks. Those who enter the company as specialists, for example, may choose to continue as specialists, progressing up through thought leaders in their current specialty or switch to another specialty. Those looking for new technical challenges can move to an architect track and those looking for more of a business focus can move to the consultant, project management or sales tracks. The company also provides a skills assessment tool that recommends the capabilities required for a chosen track and the learning assets that can best help the employee prepare for this track. IBM has also expanded its mentorship program to help guide employees through career choices and has implemented a cross-border mentoring program (to provide growing market employees with adequate access to mentors in developed markets) and a virtual Facebook mentoring program (which is now being made available to students, as well as IBM employees).

IBM also has a program to help employees who are not sure in which direction to take their careers. The online "Blue Opportunities" application allows employees to register for temporary or part-time openings in other departments across the company, so they can try a new career path before they commit to it.

Changing Development Priorities

Although IBM looks for a range of attributes in new employees, as mentioned, intellectual curiosity and commitment to lifelong learning are becoming increasingly critical for all IBM employees. The company, after all, is in the middle of two fundamental transformations:

- From a vendor of hardware, to one that is focused overwhelmingly on services and software; and
- From a vendor of IT solutions to one of business solutions that are tailored to the needs of specific industries.

These new focuses increasingly require that IBM employees understand the nature and needs of specific industries, how value is created in these industries and how IBM products and services can be best applied to deliver this value. This requires entirely new sets of skills. As mentioned, employees must have T-shaped perspectives to understand how specific technologies can best be applied to deliver maximum value to a particular company in a particular industry. IBM, therefore, has adapted its assessment programs and learning assets to help employees develop T-shaped skills, has expanded its use of cross-functional teams and has more than doubled its investment in industry-specific learning assets.

And since experiential learning is so critical in the learning of industry needs and the crafting of compelling, industry-specific value propositions, IBM is increasingly providing such opportunities as through the use of scenario-based tools and serious gaming (including INNOV8), expanded

mentorship programs, assigning projects on the basis of industry and by providing more opportunities for employees to work with experienced employees (from across multiple disciplines) on customer engagements.

Balancing Personal and Corporate Objectives

The company is also providing a greater range of more rewarding opportunities for employees to pursue their own personal objectives—even when these may provide limited direct value to IBM. Examples include:

- Personal learning accounts, where IBM matches 50% of employee contributions of up to \$1,000 per year. Employees can use the money to fund whatever type of education or training they wish, including preparing for jobs in other industries or companies; and
- Corporate Services Corps, in which IBM supports the desires of high-performance employees (400 employees from about 10,000 applicants for the most recent assignments) to help other people and learn to thrive in a global economy by sponsoring multi-country, multi-disciplinary teams to perform community-driven economic development projects in developing countries.

While some IBM employee development programs provide opportunities for personal—as well as professional—development, most of its efforts are intended to deliver demonstrable business results. Consider, for example, its self-assessment tools. In addition to guiding employee development efforts, these tools also provide IBM with a detailed employee skills inventory which it uses to determine near-term project staffing requirements and long-term corporate needs assessments. IBM's Professional Marketplace tool uses this inventory to help managers staff projects. The manager defines the types of skills required, project duration, location and budget requirements and the application identifies potential combinations of employees with appropriate skills, available time, appropriate billing rates and so forth.

The company uses similar tools to plan for long-term staffing needs, to assure that IBM has an adequate pipeline of people to address future needs by recommending hiring priorities, training assets and career paths required to meet future needs.

Section Four: Implications and Opportunities

IBM's investments in universities and in its employees deliver direct, demonstrable benefits to at least four constituencies (professors, students, universities, IBM employees and IBM itself) and indirect benefits to at least two others (IBM customers and partners).

Academic Initiative Payoffs

Figure 2 summarizes the academic advantages which have been discussed throughout the report. They include not only the direct benefits to Academic Initiative participants, but also the indirect benefits to IBM customers and partners.

Figure 2: IBM's Academic Initiative Benefits Six Constituencies

Participants	Benefits
Professors	<ul style="list-style-type: none"> ♦ Helps them tune their courses to evolving market needs ♦ Provides them with access to required tools, domain experts and new learning techniques ♦ Funds courseware development and research initiatives
Students	<ul style="list-style-type: none"> ♦ Provides them with the type of skills that are likely to directly lead to challenging, high-paying jobs ♦ Provides tools that allows them to learn in new ways ♦ Opportunities for scholarships, fellowships, internships and permanent jobs
Universities	<ul style="list-style-type: none"> ♦ Helps them create differentiated curricula that will prepare students for desirable jobs and expose them to potential employers ♦ Encourages and funds research in promising new fields, some of which may offer commercialization opportunities ♦ Facilitates linkages with private sector companies (including IBM partners and customers) around real-world needs
IBM Employees	<ul style="list-style-type: none"> ♦ Prepares them for higher value jobs within IBM and facilitates assimilation into the IBM culture ♦ Provides them with increased opportunities and tools with which to plan their own careers ♦ Helps to instill the type of adaptability required to adapt to changing future employment needs
IBM	<ul style="list-style-type: none"> ♦ Provides and gives IBM preferred access to students trained in disciplines that IBM requires ♦ Enhanced engagement with institutions that can conduct independent research in and lend credibility to IBM initiatives ♦ Establishes relationships that can help IBM better understand and more effectively sell into government, one of its most promising growth markets
IBM Customers	<ul style="list-style-type: none"> ♦ Provides IBM with the resources to help customers reengineer and transform their own processes ♦ Provides a pool of graduates that are trained in the application of IT to business needs ♦ Provides opportunities for tripartite (customer, university, IBM) partnerships in the training of students around specific customer requirements and customer-directed research projects
IBM Partners	<ul style="list-style-type: none"> ♦ Indirectly expands partner sales opportunities by increasing exposure of promising IBM market initiatives ♦ Provides a pool of graduates that are steeped in IBM's highest-profile initiatives and underlying technologies ♦ Facilitates synergistic linkages, as through university research centers, with professors, students and potential customers

Source: Beyond IT, Inc.

Although these benefits are indirect, and admittedly secondary to IBM's initial goals of preparing students for careers in the IT industry, these indirect customer and partner benefits will become increasingly pronounced as initiatives such as SSME and Smarter Planet gain more market traction and customers begin to implement them.

Competitor Implications

But what implications do these programs have for IBM competitors? First of all, let me be clear: None of these efforts are unique to IBM. Every technology vendor, of every size, has its own employee development and training programs. Most large companies have extensive, active university relationships that include many of the same components as IBM's. IBM's program, however, has a couple of important differentiators:

1. IBM's emphasis on more holistic T-shaped skills, and its work with universities to integrate IT skills more seamlessly into all academic disciplines, promises to produce people who value and understand how to use IT as a tool in producing business value;
2. Its big SSME initiative has the potential of transforming and dramatically improving the efficiency and productivity growth of the service processes that constitute about 70% of the GDP of developed country economies; and
3. IBM's expansion of its efforts beyond IT skills into business skills, and especially its alignment of university program with its Smarter Planet initiatives, allows it to reach far more students than competitor programs.

The second and third factor, in particular, have the potential of delivering huge benefits to IBM, and indirectly, to its customers and partners. Both, after all, are intent on systematizing, componentizing, automating and adding intelligence to the types of stale infrastructures and processes on which all companies and countries depend for growth.

One of the greatest long-term benefits of IBM's university initiatives, however, is likely to come from applying IBM Smarter Planet perspective (that virtually every system can be enhanced by reengineering and adding intelligence to it) to university curricula.

As discussed, the percentages and absolute numbers of developed country students with concentrations in STEM-related disciplines has been steadily declining. Although IBM, along with its competitors, is certainly attempting to make these technical courses of study more attractive and rewarding to students, IBM is doing something more. It is attempting to reach out to students (via their professors) across virtually all disciplines, as by:

- Demonstrating the value that IT-related skills can deliver within their specific specialty, and how these complementary skills will improve their employment and career prospects; and
- Improving the overall image of IBM among all students by demonstrating IBM's commitment to addressing the types of social and environmental causes that are important to the students, as with Smarter Cities, Smarter Energy, Smarter Food and Smarter Transportation.

Those students that recognize the value of applying technologies to their disciplines may learn from IBM instructors, use IBM courseware, learn to use IBM software and may receive fellowships or internships from IBM. Even if these people do not work for IBM, they are more likely to have a favorable impression of the company, have a predisposition for IBM products (on which they learned) and perhaps even favor working with the company, relative to its competitors.

The benefits attributable to engaging students around shared social and environmental values are much more abstract and speculative. These students, however, will end up working somewhere. Many will have at least an indirect voice in influencing how their company, their government body or their NGO spends its money. IBM has a potential of benefiting from any type of pre-disposition these people may have toward IBM.

Emerging Mandates

What does this all mean to other companies? First, there are always lessons to be learned from the practices of any company, especially from those that do so many things right. Second, and more importantly, all companies must face the declining interest in STEM by developing country students. These companies must increasingly reach beyond the declining pool of STEM graduates to ensure the availability of people required to fuel their own growth.

Just as importantly, they must also ensure an adequate supply of employees for their customers and their partners. As I continually emphasize in [my blog](#), customers require not only trained IT people, but also businesspeople who understand how to apply IT to gain business value, and who are gaining growing control over corporate budgets. If companies have insufficient numbers of such people, their appetite for IT will decline. Worse still, if these businesspeople have been trained on a competitor's products and are predisposed to working with that vendor, a growing share of the customer's wallet will go to that vendor.

Partners, meanwhile, will face the same challenges as vendors themselves, except more so. After all, the largest employers—and those with the most powerful brands and that offer the most attractive career opportunities—typically get first choice of the best recruits. Smaller partners must share what is left over with their customers. Partners who cannot attract sufficient numbers of technical employees—especially those trained on their vendor's technologies—will suffer. Partners who cannot attract sufficient numbers of employees who understand—and can show customers—the value that technology can deliver to their customers' business; will be in even worse shape.

All vendors, therefore, must increasingly reach out to students beyond their traditional core STEM constituencies. They must engage students not only around the merits and use of their tools, but also around the value these technologies can deliver to the student's particular field of interest, whether that field is consumer entertainment, biology or art.

This will be a particular challenge for vendors that focus overwhelmingly on IT-based (rather than broader business-based) value propositions and those whose academic programs focus on teaching specific technologies (rather than broader business applications of IT). After all, while technical professionals will continue to play a vital role in the global knowledge economy, they will be far outnumbered by other professionals who are less interested in the inherent virtues of technologies, than in the ways in which technology can enrich their jobs and their lives. And, as we are already seeing, these professionals will continue to gain greater control over larger portions of corporate technology budgets. ■

Reports by Author Tom Kucharvy

2009

- Can HP's Technology Solutions Group and EDS Transform Each Other?
- Why the Private Sector Must Develop a Socially Responsive Workforce Globalization Policy
- The Impact of Offshore R&D on U.S. Technological Competitiveness
- Transforming IBM from a Multinational Corporation (MNC) into a Globally Integrated Enterprise (GIE)
- IT Solution Vendors' Three Big New Growth Opportunities

2008

- The Private Sector's Plan for Defusing the Knowledge Offshoring Time Bomb
- The Future of IT-based Offshoring: India's Changing Role
- The Foundations for a Knowledge Services Offshoring Economy
- The Offshoring of Professional Services: Tip of the KSO Pyramid
- China's and India's bids to Become R&D Powerhouses
- The Emergence of India's Global Power Corporations

These and a broad range of additional issues related to the jobs and the workforce of the 21st century are continually updated in [Tom Kucharvy's blog](#).

Beyond IT: Strategies for Managing in a Global Knowledge Economy

Developed countries have mostly migrated from economies based upon manufacturing products to producing services—increasingly knowledge-based services. Now developing countries, led by China and India, are rapidly heading in the same direction. Every individual and every company that hopes to prosper in this new world must understand how to most effectively compete in the new global knowledge economy (GKE).

Beyond IT is a market strategy and consulting firm that helps companies manage the transition to a global knowledge economy by:

- Helping IT vendors identify and prioritize emerging GKE opportunities and challenges and leverage their existing skills into value propositions that transcend IT to deliver broader business value to their customers and clients; and
- Providing all companies with single-source access to emerging best practices around the requirements for managing workforces, innovation and corporate social responsibility in a GKE.

Through reports, webcasts, workshops and consulting, we:

- Identify the key components of a global knowledge economy and why GKE is becoming a business mandate for virtually all companies;
- Explain why IT vendors are so well positioned to capitalize in a GKE and how they can most effectively leverage the experience gained from their own GKE initiatives into new revenue streams and more strategic client relationships;
- Identify emerging trends and best practices that companies can utilize for building their own successful GKE strategies;
- Assess the new opportunities for capturing and deploying innovation in a GKE; and
- Examine how a global business needs to balance its business requirements with corporate social responsibility.

Beyond IT's founder and author of this report is Tom Kucharvy a 30-year IT industry analyst veteran with an impressive record of anticipating trends—and helping clients drive and prepare for industry-shaping change. Whether or not you agree with Tom's out-of-the-box thinking, his honest, objective analysis is guaranteed to open your eyes to new possibilities.