

## Executive Summary

Science and technology have acquired increasing importance in the development of contemporary societies. Governments, firms, universities, and research laboratories all take part in the process of building what has been conceptualized as national and/or regional science and technology systems. The actions of these key players and the interactions between them determine the impact of science and technology activities and, more generally, of innovation strategies on the well-being of nations. One of the most important challenges in maximizing this impact is to understand and manage the complex processes that underlie world-class science and technology research, commercialization, and management. In addition, knowledge integration in key subjects is required to enhance economic wealth, shared prosperity, and social and cultural enhancement.

Countries across the globe have been pursuing their own respective national innovation initiatives for the 21<sup>st</sup> century. For the US to evaluate its National Innovative Initiative, it is important for it to compare itself with the efforts of the major global economies. Germany, UK, France, Italy, Canada, Japan, China, Brazil and India have all initiated plans to innovate their economies. The International Innovation Comparative Matrix provides a detailed outline of each country's response to the challenges that they each face.

Canada and the European countries (UK, France, Germany and Italy) have focused intensely on building stronger bonds between academic institutions and the domestic government. Programs have included government sponsored fellowships and grants that will enable students to pursue further studies in engineering and sciences. The governments, most notably the British, also provide incentives for top global researchers and educators to help develop better innovative networks within the domestic country.

The Asian economies have put more emphasis on making corporate and government transactions more transparent. These economies, most notably the Chinese and Korean, have been afflicted traditionally with "too friendly" relationships between certain companies, financial institutions and the government, thusly causing imperfect diffusion of knowledge and growth in the domestic economies. Because global competition demands are increasing rapidly, the governments realize that they need to ensure all domestic firms share the same opportunities to pursuing innovative activities in order to improve competition.

The developing countries – India and Brazil, demonstrate immense potential for long-run growth because of the large population base and increasing levels of FDI, knowledge and technological capabilities. But, they currently have many infrastructure problems that need to be addressed before they can adequately begin to compete on the global level.

Each country seems to have identified that genetics, nano-technology, and energy as frontiers to pursue. That is why most countries, namely Italy, Japan, UK, France, Canada, Germany and China are actively researching ways to develop these frontiers as well as to become the global leaders in these fields.

Finally, Canada, Japan, UK and France, currently have the strongest network to innovate as well as to cultivate new technologies. These countries have the most capable resources and the strongest means to facilitate innovative activities. The Asian economies still need to legitimize their financial institutions as well as establish more market-oriented economies. But, there are signs that other Asian economies are beginning to undertake more leadership roles in programs for global innovation. China, and Korea have all demonstrated creative and successful methods to further innovate their economies. The global economy is now a multi-player game and it appears that there are a number of players eager to join the game through improved education, technological developments, and innovation. There are many opportunities for IBM to offer its services in the global economy and should therefore pursue them before other companies seize them.

Christian E. Lowe

## Definition of 21st Century Innovation

### Germany

- The German chancellor Gerhard Schröder proclaimed 2004 as "The Year of Innovation and Technology"
- Government is working on a "High-Tech Masterplan"
- The main actors in innovation policy are: the Federal Ministry of Education and Research and the Federal Ministry of Economics and Labour
- Moving towards becoming an "Internet Society"

### UK

- The government is aggressively pursuing measures to spur innovation and to stay competitive with the international markets
- Their main focus on achieving their goals is on funding education and developing technological clusters

### France

- The government has devised the *Innovation Plan* that is composed of a series of measures, in 7 main areas, aimed at encouraging innovation and the development of creative enterprises
- Since the enactment of the *Innovation and Research Law* the country has undergone three years of intensive work in the development of innovation policies

### Italy

- Important measures regarding the development of the new economy and innovation are contained in the *New Government's 100 day Program*
- The program focuses on innovation in a part of the Bill entitled "*First Interventions for the Relaunching of the Economy*"

### Korea

- The Korean government has announced a determination to make information and e-commerce the basis for a "New Economy."
- Moving towards becoming an "*e-development state*"

### Brazil

- Recognized that the country is very behind foreign competition and must therefore improve technological innovation capabilities
- Biggest obstacles are to address the knowledge base and to broaden the "*technical culture*"

- The return to a democratic government and assistance from the World Bank have been the major influences for its growth potential

### China

- Government wants increase its global R&D share from .69% to 3% by 2010.
- Fastest and longest running level of high growth economy in the world
- Becoming the technological hub of the world, by increasing its global share in FDI, R&D, GDP growth rate and largest population
- Very low per capita income is a serious problem that the government is focusing on improving through education and technological innovation

### Japan

- **Current Policy Initiative: “e-Japan Priority Policy Program—2003”** Objectives: IT Strategy Headquarters was established within the Japanese Cabinet to represent the country's efforts in the global IT revolution, decide a plan to promote use of information technology throughout Japanese society, and to provide support and guidance for IT strategy and its implementation with the ongoing goals of:
  - Enabling all Japanese citizens to enjoy the benefits of the IT revolution;
  - Comprehensively promoting measures aimed at developing Japan into an internationally competitive "nation built on IT"
- Revision Policy: Acceleration of Fiscal and Structural Reforms
- Two important laws have passed to promote innovation growth and creative business strategies: *1) Law for the Promotion of Creative Business Activities and 2) Law for Supporting Business Innovation*
- **Strategic Framework for Intellectual Property Policy:** aims to enhance Japan's industrial competitiveness

### Canada

- Set up the Advisory Council on Science and Technology (ACST)
- Plans to double funding by 2010
- **Special Recovery Projects** – government sponsored programs to revitalize the nation's technology and research capabilities

### India

- Prime Minister Atal Bihari Vajpayee is running for re-election on a promise to make India a developed nation by 2020.
- The government has the vision of making India the world's preferred contract research destination and a provider of top of the line R&D products and services

## Innovation Skills

### Germany

- *Helmholtz Association of German Research Centres (HGF)* is the largest resource centre in Germany and is designed to carry out long-term oriented basic research as well as research in key industries.
- *December 2002 – 4-year plan*
  - Educational reforms to increase levels and quality of education to be able to compete with international standards
  -

### UK

- Pursuing measures to increase the number of PhD candidates in these fields as well as measures increase the commercialization of research
- Intended as a permanent “*third stream*” of funding for universities, the new *Higher Education Innovation Fund* will incorporate the existing *Higher Education Reach Out to Business and the Community Fund*, effectively tripling in size by the end of 2004.
- 34 million pounds to meet the cost of raising the value of research council PhD studentships by 36%
- A *Higher Education Innovation Fund* of 140 million pounds over the next three years to encourage universities to transfer knowledge to industry
- Government has begun the *eScience Initiative*: this project aims to increase scientific breakthroughs

### France

- The Hourtin University is used to promote an innovation culture.
- The “Villa of Education,” situated in Grenoble is dedicated to educative multimedia
- 7 “digital campuses” have been created to innovate the fields of economics, management, mechanics, engineering, and business law
- The Ministry of National Education and Multimedia have signed several contracts with informatics firms (e.g. IBM) and content providers (e.g. IGN le Louvre, Météo France, INSEE) in order to implement a digital space freely accessible for teachers and students

### Italy

- A Broadband Task Force was created by the Minister for Innovation technologies and the Minister for Communication.
- The Task Force’s main objectives include the discovery of a permanent tool, able to support both comparison and exchange of broadband installation
- Training programs in ICT financed with part of firms’ contribution of 0.3% of payroll earnings towards continuous training
- New programs to improve technological literacy and to increase employment in high-skill careers

### Korea

- To ensure the optimal exploitation of the electronic society by its citizens, the state through the *Cyber Korea 21* project declared war on the so-called digital divide separating the electronically knowledgeable and equipped from those who are not.

### Brazil

- Inventive activity is low – a few dozen per patents year as compared to a few thousand per year in Korea
- Is the most entrepreneurial country in the world, as measured by the percent of the population creating enterprises (the vast majority of them are not technologically sophisticated)
- Very high rate of illiteracy, despite significant recent progress
- World Bank programs have enabled the country to recruit a high level scientific labor while providing it with world class equipment

### Japan

- Increased number of fellowships for post-doctoral students in tech-fields
- Increased mobility of researchers
- Corporatization of Universities: formerly national universities have now become Independent Administrative Agencies which can receive private funding

### Canada

- Government wants to provide universal access to tertiary education, through government financial assistance, to increase levels of engineers and scientists in the work force
- For many years, Canada's SchoolNet has been very successful in helping Canadian students and teachers develop information and communication skills

### China

- Main focus is still concerned with primary education.
- Per capita number of scientists and engineers has increased by 1% over the past five years
- China invests 2.5% of GDP in education.

### India

- **The Department of Science & Technology (DST)** was established in May 1971 with the objective of promoting new areas of Science & Technology and to play the role of a nodal department for organizing, coordinating and promoting S&T activities in the country.

## Innovation Environment & Infrastructure

### Germany

- *The VERNET* programme aims to promote technologies that ensure a safe data exchange between firms, administration and individuals
- The *INST-Network* financed by the BMBF offers various promotion programmes in the field of IPRs. The network consists of partners from innovation and patenting (patent agents, regional patent information agencies, information brokers, regional invention agencies, management consultants, agencies for technology, transfer offices in higher education and research institutions), forming a nation-wide office-network that allows SMEs to use expert information from all of the partners.

### UK

- The *Regional Development Agencies (RDAs)* in England aim to promote the development of R&D clusters, including the encouraging the setting up of science parks and business incubators.
- *Regional Innovation Funds*, worth 50 million pounds a year, to be made available to *Regional Development Agencies* to support technology-based clusters and incubator projects

### France

- Initiating new measures to better valorize the research of enterprises: 1) Partnership contracts between public and private research to transform an idea or product in the market; 2) Patenting and the exploitation of a patent portfolio; and 3) The creation of young and innovative enterprises
- Creation of Technological Platforms, whose aim is to put the means and competencies of public education institutes at the Small to Medium Enterprises' disposal.

### Italy

- One of the main objectives is to stream the relationship between public and private subjects in order to improve the capacity of the different R&D actors to act as a "system."

### Korea

- More than 50% of the households are connected via broadband (DSL or cable) – the highest proportion in the world, easily outstripping the US and Europe.
- *National Basic Information System, (1987-1996)*  
First project to mobilize resources for use and promotion of computer networks
- *Korea Information Infrastructure, (1995-2005)*  
Construction of national high-speed public backbone, development of IT applications, and promotion of public-private cooperation in R&D
- *Cyber Korea (1999-2002)*  
Response to financial crisis. Reforms for transition to information society

and for increased ICT productivity

- To combat the problem of barriers to communications and the exchange of knowledge between academia, businesses, and government the government has institutionalized the collaborative efforts amongst the different sectors by introducing the:

*Informatization Promotion Advisory Committee* under the *National Framework Plan for Informatization Promotion*.

### Brazil

- Very weak access to internet and mobile technologies
- Government intends to increase access from 40% to 75% over next 5yrs

### Japan

- Increased cooperation between government, universities and corporations
- Decreased the number of agencies and ministries to lower the level of bureaucracy
- In 1994, NTT announced plans to wire every Japanese household with fiber-optics by 2015. But then MPT announced a target date of 2010, so NTT changed its projections to 2010 as well. Today, many officials and observers privately say fiber-to-the-home will not happen by 2010, both because of cost and because there is no clear demand on the part of users for such high-speed service to the home. However, there is still a clear emphasis on building the infrastructure as a means of stimulating demand, rather than waiting for demand to drive investment in the infrastructure.

### Canada

- Increased use of satellites to link and integrate students and scientists across the nation
- Internet and mobile technologies are accessible in every city in Canada
- 70% of population has access to internet, up from 45% in 1994

### China

- Over 100 million phone lines with a 35% growth rate per year
- Mobile phones increasing by 150% per capita per year
- Low bandwidth capabilities – only 355 megabytes compared to 37 gigabytes in Taiwan
- ***The China Education and Research Grid*** — the most ambitious grid project by a government to date — is being launched this month with six universities, and will link more than 200,000 students and faculty members at nearly a hundred universities across China when the project is completed. When phase one of the project is completed in 2005, the grid will perform more than six teraflops, or trillions of calculations per second, and eventually will be capable of more than 15 trillion calculations per second.

India

- India's estimated 800,000 high-tech workers in hubs such as Bangalore have become lightning rods for developed nations' concern over their citizens' job security
- India has a total working population of some 430 million, and an infrastructure insufficient for its aspirations. While the country is turning out some of the world's finest scientists and engineers (many of whom are still leaving for Silicon Valley or Europe), it is in desperate need of innovation addressing such basic needs as roads, water, power and ports.

## Innovation Finance

### Germany

- For R&D funding most SMEs (Small to medium enterprises) receive direct grants from the government or low interest loans from banks as well as funds from venture capitalists
- Public deficit of over 3% puts a strain on the government's willingness to appropriate funds for cost-intensive new policy measures i.e. less inclined to spend on R&D efforts.
- The largest programme for financing innovation activity in terms of funding volume is the "*Direct Research Grant within Thematic Programmes*" – providing grants in aid for R&D projects
- The *EASY* system for applying for R&D grants and the planned *ProfiOnline* system execute all administrative procedures concerning R&D grants electronically

### UK

- The *Spending Review* has published that there is an increased budget for the improvement in research infrastructure, to maintain a science budget and for new research facilities in the fields of bio-technology and nano-technology.
- The Government has recently announced the creation of new *Regional Innovation Funds* to assist RDAs in the implementation of these initiatives.
- The Government plans to continue increasing its budget of the *Office of Science and Technology (OST)* by 7% each year.

### France

- Government has increased its investment on R&D to 3% of GDP
- Developing measures to increase the fluidity of transfer of government aid to companies for innovative research and projects
- The Ministry of Research, from 1993-2003, has financed 16 Thematic Research and Innovation Networks (RRIT) for a total of 299 million Euros.
- Financing for 2003 (80.17 million Euros for 131 projects) decreased slightly from 2002 (86.85 million for 148 projects)
- Main sources of financing are: 1) *New Stock Exchanges and Markets*; 2) *Public Venture Capital Fund*; 3) *Mutual Fund for Innovation* – government sponsored; 4) *Finance Act* – provided more tax exemptions for innovation projects; 5) *Subscription Bonds*; and 6) *Seed Capital Funds*

### Italy

- Venture Financing: Enhancing the role and in collaboration with the new stock exchange trade Borsa Spa and increasing the number of publicly traded companies
- Creation of the Fund FISR is designed to finance projects for the advancement of basic research in high scientific and technological relevance. Has a budget of 15 billion euros and 70% of the costs of projects will be financed through the FIRB.
- Developed a single fund FAR to connect all financial resources and to manage them under unified evaluation procedures and the same administrative rules. The fund is

managed by MIUR as far as industrial research projects are concerned and by the Ministry of Productive activities

### Korea

- The Korea government has given many helping hands to start up internet companies with intentions to spur domestic competition – thusly to increase the level of services and to drive down prices. By taking on a portion of the risk of R&D, the state spurred innovation to the tune of a 200-fold return on initial R&D investment realized through the sale of products and services based on newly developed technologies.

### Brazil

- The R&D effort is low: only about 0.8% of GDP.
- New polices have been set forth in 14 Funds designed to spur R&D efforts, the budget is (1 billion reals).

### Japan

- Efforts to overcome deflation – Move to strengthen spillover mechanisms and expansion of private-sector demand
- Opening of administrative services to promote easier flow of capital
- The Central Bank will maintain the quantitative easing policy until the CPI reaches 0% or an increase in 2005
- Real growth rate for 2004 is expected to increase to 0.6% by end of '04 and 1.5% end of '05.
- Reduce taxes on SMEs from 26% to 20%
- Reduce personal income tax under the “angle tax scheme”
- For R&D activities conducted by corporations, a proportional R&D tax credit of 8% plus 2% (applicable only for FY 2003 to FY2005) of the amount of R&D expenditure shall be introduced.
  - For corporations with a higher proportion of R&D expenses, up to 2% of additional tax credit shall be applied.
- For R&D activities conducted by SMEs, a proportional tax credit of 12% plus 3% (applicable only for FY 2003 to FY 2005) shall be introduced.
- For R&D activities conducted jointly by academic, business and government circles, or R&D commissioned by the government, in order to promote basic studies or innovative studies, a proportional tax credit of 12% plus 3% (applicable only for FY 2003 to 2005) shall be introduced.
- Scope of qualified IT investment to include both hardware and software
- Corporations may elect tax credit (10%) or special allowance for accelerated depreciation (50%)
- The amount of tax credit shall not exceed 20% of the amount of corporation tax.
- Tax credit exceeding the ceiling may be carried-over for one year under certain conditions.
- Research Institutes (Independent Administrative Agencies) can now receive

private funding

- Doubled government funding for competitive research from 9% to 18%

#### Canada

- Plans to double funding by 2010 in R&D as percentage of government expenditures
- Funding has decreased over the years, result of decline in business R&D performance

#### China

- Vast increases in FDI (currently the largest recipient of FDI in the world) has enabled the financial institutions to improve
- The banking institutions and stock market still suffer from transparency problems
- Venture capital investing accounts for .39% of GDP

#### India

- **National Innovation Foundation.** Dr. Mashelkar also founded the National Innovation Foundation (NIF), which seeks to foster grassroots innovation, particularly using sustainable technologies. It has "set up a micro-venture innovation fund for individuals who have no bank account and who cannot produce any balance sheet and yet have innovations that warrant investment of risk capital," according to director Anil K. Gupta.

## Innovation Frontiers

### Germany

- *BioChance and BioProfile provide funding on the regional and national levels to provide funding for research-intensive start-ups*
- *BioFuture is a competition that provided funding to young scientists in bio sciences, with the intent that they start their own firms. So far, 43 young scientists have received over 55 million euros and 8 of them have created their own firms.*

### UK

- 252 million pounds for new research initiatives, concentrating on the biosciences, IT and, in particular, post-genomic research and the development of a successor to the *World Wide Web*, but also for research on sustainability and nanotechnology
- A new *LINK Programme*, the largest ever, in *Applied Genomics for Healthcare* was launched in July 2002 and it is designed to assist in the development of technologies in control of gene expression, analysis of gene products and DNA-based diagnostics.

### France

- Assistance to R&D projects of “Young Innovative Enterprises”
- Ministry of Research has given each of these projects over 20 million Euros from 1998-2003: 1) Research and Telecommunications National Network (50.35 million); 2) PREDIT (38.75 million); 3) RNTL (National Network of Research and Software Innovation Technologies) (37.11million); 4) RMNT (French Research Network in Micro and Nano Technologies) (30.56 million); 5) GenHomme (Human Genetics and medical Innovation Network) (27.26 million); 6) RNTS (National Network for Health Technologies) (23 million); 7) Genoplante (22.52 million)

### Italy

- Major fields currently under research: Fuel cells; Nano-technologies; Opitcal and electropical sensors; and Molecular modeling

### Korea

- Domestic manufacturers of cutting-edge hardware are constantly developing and testing new products in the Korean market before selling them abroad.
  1. These products include: Cellular telephones that take digital photographs and have wireless Internet access to the latest third-generation (3G) mobile communications.
- The growth of content has kept pace, with the number of registered Korean domains (.kr) ranking Korea 5<sup>th</sup> in the world and featuring the world’s highest-ranked Web site in pages per user and session time.
- As a result of these advantages, Korea’s domestic e-commerce has flourished. In 2001 e-commerce accounted for \$9 billion, or 2.1% of the Korean economy, and within one year

it grew by 49.4%. By the end of 2004 it is expected to reach \$200 billion, or 18% of the economy.

- Finally, to stimulate private enterprise, the plan envisions the deregulation of the communications sector. Progress on the infrastructure was so fast that the completion date was shortened by 5 years to keep up with the unexpected market demand and developing technology.

### Brazil

- Best areas for development are in: deep sea oil exploration, tropical agriculture and regional aircraft manufacturing in which world class technologies have been developed in taking advantage of strong public structures such as government laboratories and state enterprises.
- Government put high emphasis on the telecom sector to reduce dependence on foreign companies and to develop and innovative domestic base
- Privatization of the telecom industry has reduced prices, increased competition, and provides better services
- Additional innovation example that ignited growth: the use of ethanol as an alternate fuel source created 500,000 jobs and powered 90% of new cars during its peak in the mid 1980s

### Japan

- Major focus on four fields: 1) energy; 2) manufacturing technology; 3) social infrastructure; and 4) “frontiers” (science and ocean).
  - Represent 45% of government R&D expenditures
- Future priority areas: Life sciences, information technology and communication, environment, and nanotechnology

### Canada

- Space awareness – increased activity in satellite and exploration
- Genetics and stem cell research are high priorities
- Publicly funded healthcare

### China

- Genomics and cleaner energy supplies are the main focus of research and development in China

### India

- Country needs vast improvements in roads, telecommunications, internet access, water, power and ports

## Innovation Markets

### Germany

- The *E-commerce Competence Centre Programme* offers support for SMEs that are bringing in electronic commerce. In addition to these competence-centres, a wide network of consultants has been set-up (electronic platforms, events dealing with topics like digital signature or electronic payment)
- The January 2004 tax reforms will reduce taxes paid by enterprises (both SMEs and corporations) by about 10 billion euros; this is intended to boost innovation and investment activities by firms. The basic personal allowance has been increased and the basic tax rate has fallen from 25.9% to 19.9%. In addition, the corporate tax rate has been reduced to a uniform 25%

### UK

- The *Office of Fair Trading* is being rigorously strengthened and there are increasing pressures from the Government for there to be more economic reform in Europe.
- In addition, the Government is pursuing measures to lower barriers to trade, ameliorate the IP (Intellectual Property) regulation system both domestically as well in Europe.
- 4 million pounds annual fund to provide fellowships to beat the “*brain drain*” by attracting and/or retraining up to 50 of the world’s top researchers with six-figure salaries
- A expansion in the network of “*International Technology Promoters’ and Science Attachés*” promoting UK science and technology overseas
- Consultation on new on a new code of practice for all scientific advisory committees, committing them to high standards openness and transparency

### France

- The new “*corporate tax credit for R&D expenditures*” encourages the investment and development of new technologies
- The plan in favor of industrial property rights
- “*Young and Innovative Enterprises*” are: 1) Exempt from social charges for 8 years for R&D personnel; 2) Exempt from the company’s tax; 3) Exempt from local taxes; and 4) Exempt from taxes on appreciation on securities held for over three years
- Exemption to professional taxes on R&D investments
- With the total of 30 Billion Euros in five years (1997-2002) the number of *privatizations* was important and concerned firms like Renault and Thomson Multimedia
- The government has announced the action plan improvement in the protection of intellectual and industrial property. The two main actors are: The *National*

*Institute for Intellectual Property (INPI) and the Ministry of Industry*

- Intentions to establish a real “*industrial property culture.*”

### Canada

- Increased markets for patents
- Over 100 new patents from 2001-2002
- ***Lawful Access Report*** – government initiative to consider the impact of new technologies
- Most companies look to gain patents in the US first, where most of their markets are.
- Beginning a push for mandatory installation of anti-piracy hardware in all Canadian companies
- Following the lead of the US and EU, the government wants to ratify the international copyright protection laws

### Italy

- Action Plan aims for the creation of a portal for **services to citizens**, one for **services to businesses**, a specialized portal for **employment services** and one for **certifications**
- Standardization

### Korea

- Accountability, transparency, fiscal prudence, and efficiency have increased to varying degrees, accompanied by a quick return to positive growth of its gross domestic product (GDP).
- Developed a master plan in April 2002 to expand existing airport and seaport facilities with their associated custom-free international logistics centers and the development of Korea as a regional telecommunications and information technology (IT) industry center.
- *National Basic Information System Project* – for the growth of a national electronic information network and electronic commerce
- *Computer Program Protection Act* – for the protection of intellectual property for digital goods and services.
- *Cyber Building Certificate*

The goal of the certificate was to provide 80% of households with 20 MB/s access by 2005 (Europe rarely manages 500 KB/s).

### Brazil

- A low inflation rate and a low interest rate are key and Brazil has been vulnerable to international financial crises over the past decade that has devastated its financial institutions
- The legal framework is very poor and rarely enforced due to the lack of means, weak judiciary system etc.

### Japan

- ***Strategic Framework for Intellectual Property Policy***: aims to enhance Japan's industrial competitiveness by promoting the creation, , strengthening the protection, and promoting the utilization of intellectual property
- ***Basic Law on Intellectual Property***: established to promote the creation, dissemination, and effective utilization of IP to contribute to the development of new industries
- ***Unfair Competition Prevention Law***: to prevent the technological drain from overseas

### China

- Access to financing is still limited
- Government is protective of its local industries and seeks to help in anyway to infant domestic industries to protect them from foreign competition
- Corruption is still a serious problem
- Diffusion of information is still slowed by a blanket of laws
- Though internet connections are increasing, the overall access to information is significantly less than most countries because of government regulation
- Google, Yahoo, and AltaVista have all been shut down for periods of time because the government will not permit their services to be offered to the general public
- It is a crime to "spread rumors" via the internet according to ***Article 17 of Interim Provisions on the Administration of Internet Publication***, the most restrictive of all.

### India

- Piracy (i.e. music and video copyright infringement) is rampant, but government is aggressively looking for successful means to address this issue

## Public Sector Innovation

### Germany

- Currently, the Federal Government is undertaking an integrated plan to reduce bureaucracy
- BundOnline 2006: government initiative to promote e-government
- The project *MEDIA@Komm* is intended to increase the use of multimedia and the Internet by public authorities throughout Germany

### UK

- The Government partnered with businesses have established a *Competitive Index* a set of indicators to check British performance and guide policy.
- The *Competitiveness White Paper Implementation Plan* is easily accessible at <http://www.dti.gov.uk/comp/imp1.html>  
This site demonstrates the goals of the UK Government to be more efficient and to enable firms to gain easy access to innovative guidelines.

### France

- The *Commission for Administrative Simplification* was created in 1998 to better facilitate interactions between small firms and the government

### Italy

- *E-government Action Plan*: aims to facilitate and accelerate the process of the development and adoption of new information and communications technologies
- Developed a common standard for the creation of government departments' information portals
- Composed a list of databases of national importance that is accessible via Internet
- *Single Legal Portal* – “Laws on-line” is part of a plan to create a single legal portal to facilitate and unify access to the regulatory, legal and judicial documentation
- Electronic elections – aimed to simplify the voting process

### Korea

- Among the many national projects to establish and foster the ICT sector were the:  
*Korean Information Infrastructure Action Plan (1995-2005)*  
*General Plan for Promoting e-Commerce (2000)*
- Over the course of a decade, the Information Infrastructure Action Plan provided more than \$1.5 billion of direct funding for the construction of a new, high-capacity telecommunications infrastructure as well as \$1 billion in soft loans to

the private sector and \$700 million for R&D.

- By 2001 more than 80% of all public sector procurements were made online  
In 2003, the Ministry of Planning and Budget invested \$80 million in the so-called next generation IT technology development projects, representing an increase of over 30% from 2002 and it has plans to spend \$560 million by 2006

### Brazil

- Some State-led initiatives have demonstrated remarkable success: *e-based tax collection* and *e-based election systems*.
- Brazil invests .8% of GDP in R&D, software and higher education

### Japan

- The government's 1999 science and technology budget, which totaled 3.16 trillion yen, was distributed among ministries and agencies as follows: the Ministry of Education 42.7%, the Science and Technology Agency 24.5%, the Ministry of International Trade and Industry 16.1%, the Defense Agency 4.6%, the Ministry of Agriculture, Forestry and Fisheries 3.5%, the Ministry of Posts and Telecommunications 2.4%, the Ministry of Construction 1.3% and other ministries and agencies 2.4%.
- Reduction in the number of ministries and agencies
- Mergers of the Ministry of Science and Technology with the Ministry of Education
- National research institutes have become Independent Administrative Agencies to promote competition, to enhance creativity and to allow for greater and easier access to private funding

### Canada

- Government has instituted new policies to protect the privacy of its citizens
- Looking to ease access to healthcare and government officials through internet

### China

- Public access to government officials and government information is still mostly prohibited
- The government is still highly concerned about its privacy and protects strongly
  - Search engines can be shut down if they provide too much access into Government affairs.

### India

- Government is at the very infant stages of pursuing e-government
- Because internet access is so weak, there is no immediate need for the government to become conduct its business online

## IBM Involvement

### Germany

- D21: public/private initiative to promote the "Internet Society; " IBM is a founder, together with HP, Microsoft and other IT-related companies
- Germany has signed up IBM for a major public sector computer contract : aimed at raising computer security by avoiding a monoculture

### UK

- Oxford University, IBM and the UK government are building a large-scale data grid to enable early screening and diagnosis of breast cancer, and to allow medical professionals to collaborate and share information that will help treat the disease.
- The project named 'eDiamond' by Oxford researchers is part of the UK government's eScience initiative and represents a \$6million investment by IBM and the UK

### France

- France Telecom and IBM are to bundle Web site management, hosting and payment systems in a package aimed at small businesses in France
- Dubbed "ecomptoir", the offer will enable small businesses to create sites and process order for as little as £60 a month, the companies claim
- France Telecom partnered with IBM last november to develop software and provide Internet access to the 35 million users of Minitel, France Telecom's proprietary online service.

### Italy

- In Nov. 2003, the San Raffaele Scientific Institute in Milan signed an agreement with IBM for the Blue Gene supercomputer to be installed in 2005. This will be the first research center outside the U.S. to have the Blue Gene; will be used to study protein folding.

### Korea

- IBM Corp. is to partner with the South Korean government and establish a research and development laboratory in Seoul that will concentrate on software for mobile communications devices and telematics applications.
- Both IBM and the Ministry of Information and Communication's (MIC) Institute of Information Technology Assessment plan to invest \$16 million in the center over the next four years

### Brazil

- The letter of intent with the Brazilian Federal Government for the usage of Linux on public administrations.
- The partnership with Unicamp (one of the top five top Brazilian universities) for hiring their students to work in the Brazilian LTC (Linux Technological Center), which integrated to other LTCs in the world, develops improvements for the Linux Kernel.
- IBM also participates in several academic initiatives with the Scholars Program, supplying software licenses for free for public and private universities' researches.
- With the Community Relations division, IBM provides technical infrastructure to charity organizations, computers to social institutions and sponsorships to important projects, focused on improving citizens' lives

### Japan

- Japan's National Institute of Advanced Industrial Science and Technology has ordered an IBM eServer Linux supercomputer. It is capable of 11 trillion operations per second and will be running SuSE Linux Enterprise Server 8. It is expected to end up as number three on the top 500 supercomputers list, moving the Lawrence Livermore Labs Linux cluster down to number four.

### Canada

- IBM Canada has made recent announcements on a Government of Canada e-marketplace project and use of grid computing to identify best drug treatments for smallpox, for example, but need more information from One Blue on specific IBM initiatives that might tie to federal government initiatives on innovation.

### China

- IBM and China's Ministry of Education announced they have begun using grid technology to enable universities across the country to collaborate on research, scientific and education projects. This is one of the world's largest implementations of grid computing — which takes untapped application service, data and computing resources from different computing systems and makes them available where and when they're needed, resulting in a single, virtual system.

### India

- IBM India announced a partnership with Apara Enterprise Solutions to market IBM TotalStorage™ solutions in India. IBM India's partnership with Apara will further strengthen its systems integration expertise and countrywide coverage for its Systems Group
- Taking another step into the outsourcing fray, IBM has agreed to purchase an

India-based business processing company that handles back-office support and call centers for several U.S. firms, including Amazon.com

- “Companies that may have been reluctant to sign a deal with an Indian company, especially given the tenor of the debate around the issue, can now sign with IBM to outsource everything and then let IBM decide where the jobs go,” industry analyst Ned May told the E-Commerce Times.

Christian E. Lowe