



“Research Commercialization: The role of International Organizations”

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Failures of the Technology Market

Technology market is imperfect and it often violates the assumptions of the free market paradigm:

- Externalities - technology research spillover exists (unless technologies are protected by patents or IPR measures)
- Restricted competition - technology trades are restricted due to huge upfront investment and years of operation before a positive cash-flow
- Asymmetry, incomplete or imperfect technology information - in spite of modern communication means
- Use of technology requires development capabilities - both technical and organizational
- Costly technology search
- High degree of risk and uncertainty in absorbing technologies



Technology & the Economy

- Economists agree that the creation and diffusion of technological knowledge is at the heart of economic growth
- At least two-thirds of per capita economic growth is due to technology
- Technology provides the impetus for economic growth
- Technology-based economic development focuses on enhancing the discovery, development, commercialization and adoption of technology
- Economic growth is the function of capital and labour, which is influenced by technology
- Innovation will be the single most important factor in determining a country's success in the 21st century
- Over the next 6 years, products representing more than 70 percent of manufacturers' sales today will be obsolete due to changing customer demands and competitive offerings
- The key to higher standards of living and job creation is the extent to which innovative ideas and technologies are embedded in services, products and manufacturing processes



Barriers to Technology Transfer

- Lack of access to information on new technologies and innovations
- Inadequate institutional infrastructure, management and marketing human skills
- Organizational rigidities within the firms themselves
- Limited access to finances
- Regulatory constraints
- Inefficient R&D institutes and disconnection from needs of industry
- Inadequate human resources and mechanisms for their upgrading
- Lack of resources, knowledge and capabilities within policy institutions
- Low efficacy of government support schemes



High Proportion of Scientists & Engineers in CEE/CIS Countries

Proportion of scientists & engineers Highest 12 CEE/CIS countries (Rank)	
3	Russia
20	Slovenia
21	Ukraine
24	Lithuania
25	Estonia
26	Slovakia
27	Bulgaria
32	Poland
33	Romania
34	Hungary
36	Czech Republic
37	Latvia



Proportion of scientists & engineers In selected developing countries (Rank)	
38	South Africa
40	Argentina
42	Chile
43	Egypt
44	China
46	Turkey
47	Indonesia
48	Brazil
50	Mexico
51	Uruguay
56	Sri Lanka
59	India
60	Thailand
63	Malaysia
69	Zimbabwe



R&D Institutes: New Global Setting

- Increased financial, trade, investment and technology flows.
- Rapid and accelerating technological progress, including ICTs, biotechnology, new materials, electronics, robotics.
- New managerial and organizational systems.
- New international rules and regulations: trade, quality, environment, intellectual property rights.



Needs in Research/Industry Partnerships

- SMEs are normally short of the existing R&D facilities due to high cost of research, whereas R&D institutes generally possess these in abundance.
- SMEs cannot manage all new technologies due to multidisciplinary nature of innovation projects and R&D institutes can provide this knowledge and competence.
- SMEs need an objective partner in monitoring technological advances, testing of new products, international standards, etc. enabling to manage the technological change in time so that to be competitive at the international market.



Present Performance of R&D Institutes

- Technology push and supply-driven approach
- Absence of marketing mechanism
- Largely disconnected from the needs of industry
- Weak international linkages
- Limited knowledge of international best practice to improve competitiveness through technology upgrading and technology support services to industry



Major Reasons For Revitalization of R&D Institutes: Challenges of Industry

- Global competition is getting fiercer
- Cooperation and strategic alliances are now essential
- Flexibility is becoming increasingly necessary in order to adjust to rapid technological pace and changing customer demands
- Quality requirements are higher than ever



Motivation for Encouraging Revitalization

- Seek out new sources of finance
- Establish links with the productive sector and increase industry expenditures through improved services to enterprises
- Exploit the centres' S&T capabilities on the national and international stage
- Upgrade the performance and international competitiveness
- Strengthen S&T infrastructure & improve networking capabilities



Types of Support Services

- Formulation of new vision and strategy
- Development of new management tools
- Advice and assistance in policy formulation
- Development of funding mechanisms
- Introduction of marketing and project management tools
- Benchmarking and training



Focus Areas in Specific Services

- Innovation mechanisms
- S&T funding systems
- Best practices in management & marketing
- Networking & collaboration
- Vision and strategy development
- High level policy advice



Strategy Process

- The process starts with a diagnosis of selected R&D institutes followed by the formulation of a joint with industry vision and business plan for technology promotion and provision of technical support services to industry.
- The implementation of strategies on commercialization of new technologies and innovations by industries and their support institutions are at the core of the process.
- The government policies focus on key elements of the innovation and learning support system: global business linkages, development of skills, incentives, technological efforts, entrepreneurship, SMEs and infrastructure.
- Joint programmes with focus on strengthening the relations between the support system and industry, including linkages with external knowledge partners and business and between research and the education institutions.

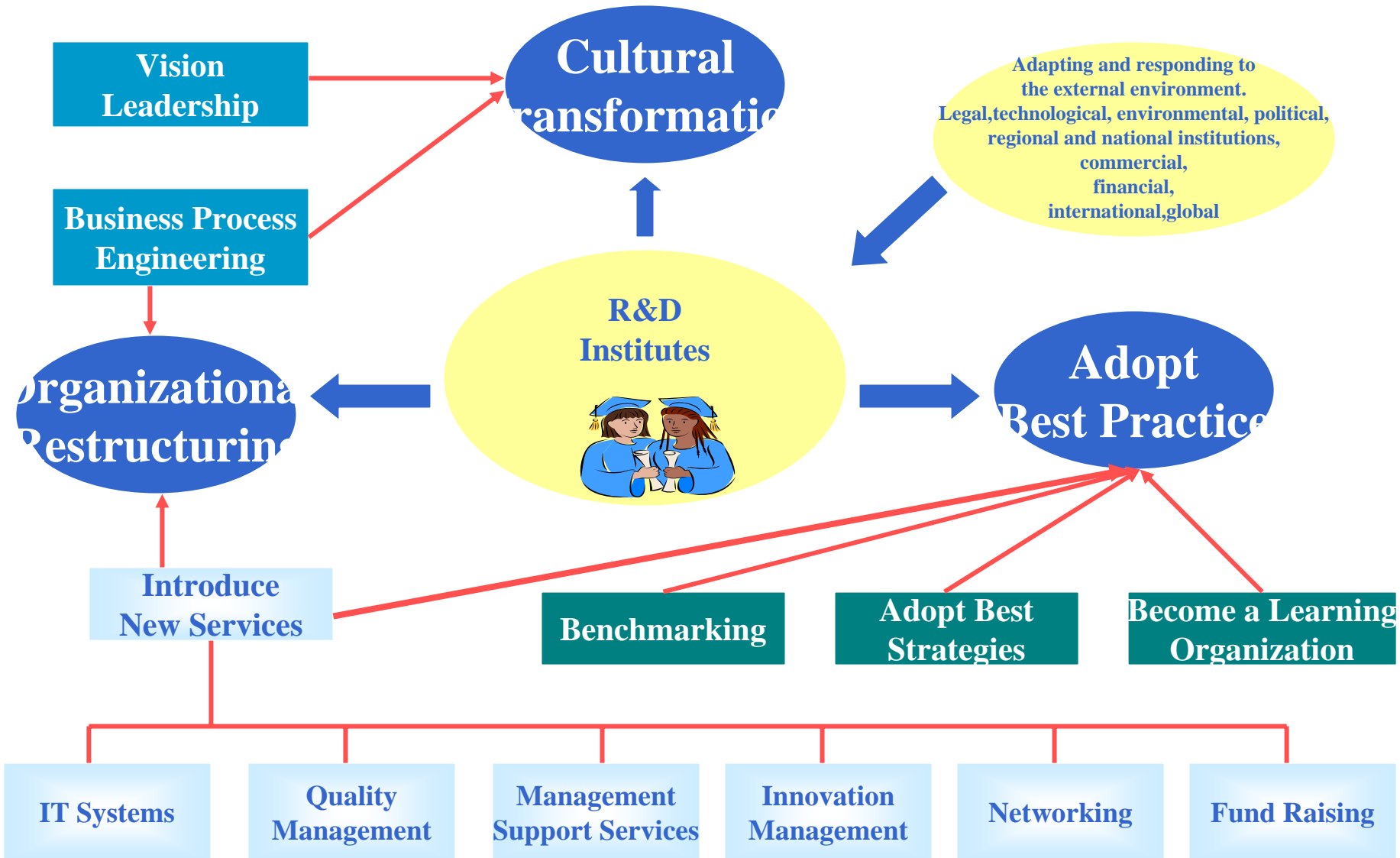


Recommendations To Improve Performance

- Develop vision and strategy based on rapidly changing economic environment
- Improve and adjust organizational structure & strengthen management system
- Design funding mechanism
- Apply best international marketing practices
- Implement project management system
- Undertake market needs analysis
- Improve negotiation skills



ITP: Strengthening Research – Industry Links (Revitalization of R&D Institutes)



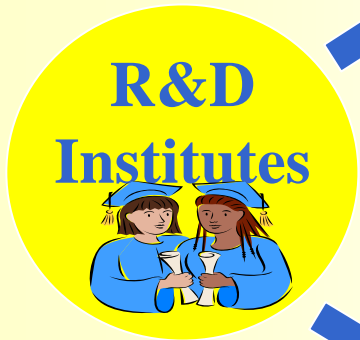


ITP: Strengthening Research – Industry Links (Revitalization of R&D Institutes)

Approaches

Actions

IPT Services



R&D Institutes

Cultural Transformation

Organizational Restructuring

Adopt Best Practice

New Vision & Leadership

Business Process Engineering

Benchmarking

Adopt Best Strategies

Become a Learning Organization

New Services & Activities

IT Systems

Quality Management

Management of Supp. Services

Innovation Management

Networking

Fund Raising

ITP as facilitator

Leading change processes -towards revitalisation

National Innovation System



The Role of International Organizations in Technology Cooperation

- Ensure transparency
- Provide technology options
- Ensure independent evaluation and selection of right technologies
- Provide support services through UNIDO tools and methodologies
- Strengthen trust between technology owners and recipients
- Decrease financial risks in the transfer of technology
- Develop multiple partnerships for sustainability



UNIDO

Experiences and Instruments

- 19 Investment & Technology Promotion Offices (ITPO)
- 9 International Technology Centers (ITC)
- 48 Subcontracting and Partnership Exchange (SPX) Offices in 28 countries
- 34 National Cleaner Production Centres
- Tools and methodologies, including software, for:
 - Investment & technology promotion
 - Technology transfer
 - Technology needs assessment
 - Entrepreneurship development



INTERNATIONAL TECHNOLOGY CENTRES (Ongoing Projects)

- International Centre for Science and High Technology (ICS, Trieste, Italy)
- International Centre for Advancement of Manufacturing Technology (ICAMT, Bangalore, India)
- International Centre for Small Hydro Power (ICSHP, Huanzhou, China)
- International Centre for Promotion and Transfer of Solar Energy (ISEC, Lanzhou, China)
- International Centre of Hydrogen Energy Technology (ICHET, Istanbul, Turkey)
- UNIDO-Shanghai International IT Technology Promotion Centre (Shanghai, China)
- UNIDO-Shenzhen Environment Technology Promotion Centre (Shenzhen, China)
- International Centre for Materials Technology Promotion (ICM, Beijing, China)
- Russia-Brazil Centre for Technological Cooperation



Russia-Brazil Centre for Technological Cooperation: Results

The Centre transferred the technology allowing to prepare geophysics airborne surveys based on use of gravimetry, gamma-spectrometry and magnetometry for exploration of oil and gas resources.

The project allowed to:

- Enable the Brazilian institutions develop a technology cooperation projects with relevant Russian institutions and enterprises
- Facilitate the technology transfer process
- Deploy the technologies in Brazil through:
 - Creation of a national company
 - Transfer and installment of equipment
 - On-job training of around 120 technicians
 - Preparation of guidelines for operation and maintenance of equipment
- Reduce the risk of investment and stabilize the funding process
- Ensure the high quality of services
- Increase the trust between the partners
- Develop new technology transfer project proposals for future cooperation



Future of Technology Cooperation: Goal & Objectives

■ Goal:

- To enhance international cooperation in technology commercialization and transfer between the countries for the sustained growth and partnership

■ Objectives:

- Act as a catalyst for knowledge-based development
- Increase capacities of science and technology institutions on innovation and technology commercialization
- Effective and efficient utilization of available science & technology by industry
- Increase productivity and industrial competitiveness of enterprises through international technology exchange
- Increase trade and investment flows between the countries



International Programme for Technology Commercialization & Transfer: *Functions*

- Assessment of needs of industry in new technologies and technology markets
- Diagnostics of technology sources, institutions and transfer systems
- Technology valuation and Intellectual property
- Mobilization of funds
- Business plan development
- Catalyze, support and facilitate concrete UNIDO programmes
- Capacity building programmes for technology commercialization and transfer
- Technology intermediary and technical support services
- Development of technology inventory, database and networks
- Advice on technology development policy





Expected Response from the Business Community

- Access to technology resources
- Availability of expertise
- Provision of information on technologies needed
- Confirmation of technology ownership
- Identification of transparent conditions for technology transfer
- Support in access to financial resources



Preconditions for Success

- Political support & endorsement from the country leaderships
- Technological cooperation as agenda of high-level political dialogue in participating countries
- Consensus on Technology Partnerships
- Active involvement of business & scientific communities





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Thank you

...for your attention.

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