

Promotion of the Technology Transfer Network for Small and Medium-Scale Enterprises in the Asia Pacific Region

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Abstract

The liberalisation and globalisation of the economies in the countries of the Asia–Pacific region have exposed the region’s small and medium-scale enterprises (SMEs) to the simultaneous challenges of innovation-led growth and competition. To prepare SMEs for increasing domestic and global competition, policy makers are devising and implementing new strategies and support programs. The emphasis is shifting from the physical aspects of modernisation to promoting strategic alliances and networking for technical innovation, technology acquisition and technology management.

Most SMEs in the Asia-Pacific region still have difficulty in sourcing, assessing, and acquiring technologies. It is, therefore, pertinent to strengthen institutional support mechanisms thereby complementing national SME support programs. Of particular importance in this respect is intra-regional technology and information exchange.

APCTT has initiated steps to establish an IT-powered technology transfer network (portal) for SMEs and intermediaries in member countries, in cooperation with relevant agencies, with the goal of promoting regional cooperation through strengthening technology transfer mechanisms and capabilities to achieve sustainable development in the Asia Pacific region.

The network is expected to enhance the capacity of institutions/intermediaries in member countries to deliver technology transfer services in order to contribute to the improvement of the competitiveness of SMEs and to accelerate adoption of environmentally sound technologies. The target groups of beneficiaries are: business users; business development, education and training organisations; and developers of online business solutions.

SMEs require expert assistance from technology transfer intermediaries as they themselves usually do not have well developed in-house support structures to carry out the job independently. A typical technology transfer service package required by SMEs includes technology/business information, search for matching technology partners internationally, support services, contract negotiation and drafting, finance syndication, and product marketing. APCTT has introduced such packages to intermediaries in the region and has assisted them to adopt these packages.

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Through the establishment of the technology transfer network for SMEs, APCTT aims at facilitating enhanced networking of technology transfer intermediaries in the region to promote cross-border business cooperation among SMEs.

It is planned to develop sector-specific technology trade communities through the network/portal by enabling participation of SMEs, technology transfer intermediaries, promotional organisations, R&D institutions/universities and experts/consultants. Sector-specific activities in selected priority areas would also need to be pursued more intensively, including the proactive identification of the technology needs of industrial clusters.

Keywords

Technology transfer network, small and medium scale enterprises, technology trade communities, technology transfer intermediaries, environmentally sound technologies, technological cooperation

Introduction

The 21st century is characterised by globalisation and systemic innovation, where new products and services are increasingly emerging from complex interactions and cross-pollination of ideas among individuals, organisations and environmental factors. The changing scenario with the globalisation of technologies and the shift in emphasis from manufacturing to a knowledge-based economy has immensely affected the competitiveness of countries and enterprises. It has impelled enterprises in developing countries to the forefront in selected sectors and has provided tremendous opportunities for leapfrogging.

In this state of flux, SMEs need to adapt themselves to new realities and challenges to stay competitive. Not only they must add new features to their products and services, improve performance and reduce prices to remain competitive, but also must innovate to create new products/services and markets. Particularly, SMEs in developing and least developed countries need to develop, absorb and adopt new technologies in an efficient way, thereby, building up indigenous technological capabilities. Therefore, they need access to improved skills and competencies, finances, markets as also an environment for innovation.

These emerging realities have intensified the process of international flows of technologies across enterprises and national boundaries in the form of increased technological cooperation, strategic alliances, and partnerships. In this context, institutional support to innovation, technology transfer and technology acquisition has become very important for SMEs to survive and enhance their competitiveness. Specialised intermediary institutions are needed to address technology transfer and technology management issues, thereby complementing national SME support programs.

SMEs require expert assistance from intermediaries in technology transfer as they themselves usually do not possess well developed in-house support structures to carry out the job independently. A

typical technology transfer service package required by SMEs includes technology/business information, search for matching technology partners internationally, support services (technology evaluation, market studies, feasibility studies, legal advice), contract negotiation and drafting, finance syndication, and product marketing. APCTT has introduced such packages to intermediaries in the region and has assisted them to adopt them. They provide a comprehensive and lean solution meeting the challenges of the new global scenario through systemic and comprehensive support services for managers, innovators and investors; online information resources; and continuous advisory and support service for diverse types of organisations.

Technology transfer network for SMEs

The activities of APCTT are directed towards technology capacity-building, promotion and management of innovation as well as regional and sub-regional networking. In this direction, it has focused on four specific areas: Technology Information; Technology Transfer; Tech-Entrepreneurship Development; and Innovation Management, which are SME-oriented, IT-powered, environmentally responsible and gender conscious.

APCTT is currently implementing the project 'Promotion of the Technology Transfer Network for Small and Medium-scale Enterprises in the Asia Pacific Region', supported by the German Agency of Technical Cooperation (GTZ), which is aimed at enhancing capacity of the member countries to create enabling environment for the development, transfer and application of technologies.

The main objectives of the network are to:

- promote regional cooperation and sustainable development in Asia and the Pacific through strengthening SME-oriented, IT-powered technology transfer mechanisms and capabilities
- enhance the capacity of institutions/intermediaries in member countries to deliver technology transfer services in order to contribute to the improvement of the competitiveness of SMEs and to accelerate the adoption of environmentally sound technologies (ESTs).

To achieve these objectives, APCTT aims to provide catalytic support to intermediaries in the member countries and develop a region-wide state-of-the-art technology transfer environment, (in the form of a portal) powered by advanced IT. In this endeavour, the existing partnerships and networks would also have to be synergised in a complimentary manner. The comprehensive and integrated IT-powered technology transfer network to be developed, with special emphasis on the technology-led SMEs in Asia and the Pacific, would include the following components:

- Databases on technology, business, service, collaboration and investment opportunities
- Technology trade communities and business circles
- Information resources on technology transfer, innovation management, tech-entrepreneurship development, and green productivity
- User-friendly service packages in accordance with the contemporary needs of SMEs

- Private and secure project management workspaces for geographically separated technology transfer project partners (to be developed in due course).

Target groups of beneficiaries and facilities

The three target groups of beneficiaries of the network are:

- business users: including SME managers, technology transfer intermediaries, tech-entrepreneurs, investors, business facilitators and would-be entrepreneurs
- business development, education and training organisations, including business development organisations, technology promotion/transfer organisations, business management institutions, universities and the media
- developers of online business solutions: including franchisees of the portal (and link pages) and independent service providers.

The facilities that would be offered via the network (portal) include:

- searchable databases on technology and business opportunities including service, investment, and collaboration opportunities
- information on technology transfer, innovation management, tech-entrepreneurship development, and green productivity
- technology trade communities and business circles for communication and idea cross-pollination among peers
- participating member country pages
- private and secure project management workspaces for geographically separated technology transfer project partners (to be developed).

Strengthening and networking of intermediaries

APCTT is already facilitating the establishment of networks of technology transfer intermediaries in the region to promote cross-border technological and business cooperation among SMEs. The intermediaries are also being assisted in developing partnerships with various stakeholders providing comprehensive technology transfer services (including information, studies, finance, incentives) internationally. As a result of this endeavour, it is expected that these networks and partnerships would expand their geographical coverage of activities in the Asia–Pacific region and make it possible to provide comprehensive technology transfer service packages to a much larger group of SMEs in a self-sustainable way. In the long run, APCTT aims at a situation where all activities not directly related to technology transfer are relegated to intermediaries and partner organisations/institutions.

The main concern of the project would, therefore, be of strengthening of the intermediaries. The measures to strengthen these intermediary institutions are envisaged mainly at two levels: (i) integration of the intermediary institutions and their internet portals into a regional network as well as their connection to other national and international networks; and (ii) supplementary consultation and further development for sustained consolidation of the services rendered by the intermediary

institutions including setting up of modern, standardised, multilingual internet portal(s). In this strengthening process, APCTT would strive to achieve a synergy effect that would benefit both service providers and their target group of users i.e. SMEs.

Technology trade communities

It is planned to develop sector-specific, web-based technology trade communities/business circles through the portal by enabling participation of SMEs, technology transfer intermediaries, promotional organisations (including chambers of commerce, industry associations), R&D institutions/universities and experts/consultants. These communities would facilitate cross-pollination of ideas and information/knowledge sharing among peers on several aspects of technology-based business opportunities, including new technologies and products, technology and market trends, best practices, government policies and practices, and national R&D infrastructure in the member countries. They would also foster enhanced cooperation among academia, R&D institutions, technology transfer intermediaries and enterprises for vertical and horizontal technology transfers. The facilities envisaged for these e-communities/business circles are:

- access to relevant online news, databanks and support services
- sharing of knowledge and ideas
- posting of technology/business proposals
- matching of prospective partners (e.g. technology, services, financing)
- expert forums
- virtual technology transfer events
- user-customised work spaces.

The content coverage would also focus on: technology sourcing and evaluation; legal aspects of licensing/technology-related agreements (e.g. model contracts and intellectual property rights issues); technology commercialisation management (e.g. startups, turnarounds, process improvement, licensing in/out and other forms of technology transactions, and technology marketing) and technology financing (e.g. seed capital, grants and venture capital).

Initially, the portal would focus on the development of technology trade communities in the areas of ESTs and 'appropriate technologies', including non-conventional energy, waste management, ozone layer protection and sustainable rural technologies. The United Nations Framework on Climate Convention has opened immense opportunities for the development and transfer of sustainable climate-friendly or environmentally sound and technologies that could be utilised by SMEs. Development of the communities in the area of 'emerging technologies' (such as biotechnology, information and communication technologies and nanotechnology) would subsequently be facilitated.

Sector-specific activities in selected priority areas would also need to be pursued more intensively, including the proactive identification of the technology needs of industrial clusters. Besides this, encouraging the cluster-based technology trade through the network could enhance cooperation

among SMEs and improve their competitiveness as a particular industrial community. This could also provide better opportunities of technological and business cooperation among large enterprises and SMEs as well as public-private partnerships.

Linkages and partnerships with technology transfer intermediaries/infomediaries in the region

To facilitate technology transfers, rather than just the provision of Internet-based information facilities, dynamic, user-oriented 'local systems' are required to deliver to clients what they really need. That is, to convert data and information into knowledge of what would best solve their specific technological problems through 'processed and competently assessed' technical and economic information tailored to needs specific to their country, sector, technology, project and site. These needs can be determined by sector/technology experts, who would require access to a range of data, information, tools, and methodologies to assist with technology assessment (generic and well as process specific) and the other components of the process of technology transfer (Pembleton 2003).

Establishing and strengthening linkages, therefore, with such dynamic, existing local systems in the form of technology transfer intermediaries/infomediaries in the various countries of the region is highly relevant and desirable. In China, for example, to facilitate the commercialisation of new innovations technology transfer information services are being strengthened. The mechanism involves the promotion of networking among intermediary service organisations, such as technology innovation service organisations, technology assessment organisations, technology agents and technology information consultancy service organisations. A total of 19 large intermediary agencies were established (as of early 2003) and located in large or central cities. Their services are not only available locally but also extended to neighbouring regions as also to whole country and abroad (Sun 2003).

There is also a need for a central repository of technology information such as those offered by APEC Centre for Technology Exchange and Training for Small and Medium Enterprises (ACTETSME). Such organisations have existing linkages with R&D institutions and other technology generators as well as with financial institutions and technology adopters (Corazon et al. 2004).

APCTT would work closely with selected technology transfer organisations (including infomediaries) in the region for further development and integration of IT-powered technology transfer services rendered by them into the regional network. Some of the organisations are:

- China Technology Market Management and Promotion Center (SINOTECHMART), China
- Shanghai Technology Transfer Exchange (STTE), China
- National Research Development Corporation (NRDC), India
- Science & Technology Park (STP), Pune, India
- Technology Bureau for Small Enterprises (TBSE), a joint venture of APCTT and Small Industries Development Bank of India (SIDBI), India
- Iranian Research Organization for Science and Technology (IROST), Islamic Republic of Iran

- Korean Technology Transfer Centre (KTTC), Republic of Korea
- Korea Institute of Science and Technology Information (KISTI), Republic of Korea
- Standards and Industrial Research Institute of Malaysia (SIRIM), Malaysia
- Technology Application and Promotion Institute (TAPI), Philippines
- Philippine Council for Industry and Energy Research and Development (PCIERD), Philippines
- International Centre for Scientific and Technological Information (ICSTI), Russia
- National SME Development Agency (NASDA), Thailand
- Office of Promotion and Transfer of Technology, Ministry of Science and Technology, Thailand
- National Center for Scientific and Technological Information (NACESTI), Vietnam.

In addition, mechanisms for exchange of information and fostering partnerships would be developed with various other organisations in the region engaged in providing technology transfer services. A selected list of such organisations, from APCTT (2004), is :

- **Australia**
Australian Science and Technology Online; Australian Technology Showcase (ATS); EnviroNET
- **China**
Centre for Environmentally Sound Technology Transfer (CESTT); Green Industry & Technology Promotion Centre of Shanghai (GITPC); Hong Kong Science and Technology Parks Corporation (HKSTP); Northern Technology Exchange Market (NTEM); TechMart — Hong Kong
- **India**
Business Information Services Network (BISNET); Environmental Information Centre (EIC); Technology Information, Forecasting & Assessment Council (TIFAC); Technology Export Development Organization (TEDO)
- **Japan**
APEC Virtual Center for Environmental Technology Exchange (APEC-VC); Asian Technology Information Programme (ATIP); International Centre for Environment Technology Transfer (ICETT); Japan Industrial Technology Association (JITA), Japan Science and Technology Cooperation (JST); NETT21 (GEC Environmental Technology Database); UNEP International Environmental Technology Centre (UNEP IETC)
- **Korea, Republic of**
Patent Bank, Techno Alliance Mart (TAM)
- **Malaysia**
Asia-Africa Investment & Technology Promotion Centre (AAITPC), Malaysian Science and Technology Information Centre (MASTIC), Malaysian Technology Development Corporation (MTDC)
- **Philippines**
APEC Centre for Technology Exchange and Training for Small and Medium Enterprises (ACTETSME), Intellectual Property/Technology Transfer (IP/TT) Initiative, Philippine Science and Technology Portal
- **Russian Federation**

Russian Technology Transfer Centre (RTTC), TECHNOCONSULT

- **Singapore**

Exploit Technologies Pte Ltd. (ETPL), Surf P

- **Sri Lanka**

Industrial Technology and Market Information Network (ITMIN) Limited

- **Thailand**

National Science & Technology Development Agency (NSTDA).

Linkages of the Asia–Pacific Regional Network with other international/regional networks

It is planned to establish/strengthen linkages of the Asia–Pacific regional network with the SME-oriented international/regional networks, such as Europe (Italy) based International Network for Small and Medium Sized Enterprises (INSME), <<http://www.imsme.org>>, and the multi-country network Technology and Trade Information Promotion System (TIPS), <<http://www.tipsasia.org>>. Such linkages would enable identifying of projects and cross-regional technology transfer support structures, and establishing strategic alliances with them for organising joint events and programs. Closer cooperation with the networks/initiatives of UN agencies such as Investment and Technology Promotion Offices (ITPO) (Miyake 2004) network of United Nations Industrial Development Organization (UNIDO) would be developed with a view to promote greater synergy and complementarity in the technology transfer and investment promotion efforts.

Support to network partners and intermediaries

APCTT would provide guidance and strategic alignment support to the network partners and facilitate integration of the national service packages into the regional network/portal. APCTT would also facilitate the development and implementation of the self-sustainability strategy of the network and provide advisory services to intermediaries in developing their self-sustainable local operations. This would include:

- assistance in developing customised design and content of the web-based service package and its integration into the regional network
- customising the service package to the needs of local SMEs, including development of multi-lingual solutions and services
- assistance in promoting the IT-powered and web-based service package concept among prospective national partners and investors.

APCTT is in the process of identifying national nodal agencies/network partners in participating member countries. It is planned to facilitate development of national technology transfer portals, based on the regional portal, in cooperation with the identified national nodal agencies in select countries. The national nodal agencies would be expected to maintain self-sustainable operations of their respective national nodes and their respective parts of interfaces, including multilingual support, between the national nodes and the entire network. Both virtual web-based and face-to-face interactions of the network members would need to be organised regularly to review the network

performance and update its further strategy in response to the feedback received as well as external changes.

Conclusion

The new economic era is characterised by rapid change, systemic innovation, globalisation, and transition to a knowledge-based entrepreneurial economy. This has intensified the process of international flows of technologies across firms and national boundaries in the form of increased technological cooperation, strategic alliances, and partnerships. In this context, institutional support to innovation, technology acquisition and technology transfer is highly important for SMEs to survive and enhance competitiveness. Specialised intermediary institutions are needed to address technology transfer and technology management issues, thereby complementing national SME support programs.

Technology information and technology transfer services at the intermediary level in various countries of the region are, however, not commensurate with the technology needs that have emerged in recent years. APCTT is, therefore, developing and promoting a value-added technology transfer network that would help SMEs and intermediaries to adapt to the emerging economic environment, to get continuous and comprehensive technology transfer support, and achieve sustainable development.

The technology trade communities/business circles to be established through the portal would facilitate cross-pollination of ideas, information/knowledge sharing among peer groups as well as horizontal and vertical technology transfers. Establishing/strengthening linkages with existing national, regional and international technology transfer networks would further facilitate providing of comprehensive technology transfer service packages to a much larger group of SMEs in a self-sustainable way.

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