

Technology Transfer & Routes of Technology Transfer

What is technology transfer ? Briefly discuss various routes of technology transfer. Give an example of specific route of technology transfer as adopted by an organisation.

- Basically there are two ways of acquiring new technology : first is Develop it or purchase it; the second way of acquiring technology is commonly called “Technology Transfer”
- Technology transfer is the process that permits flow of technology from a source to receiver.
- Source..individual,company,country
- Process by which science & technology are transferred from one individual or group to another that incorporates this new knowledge into its way of doing things.

The important reasons for purchasing technology are :

- a) It involves little or no R & D investment.
- b) Technology can be used quickly; and
- c) Technological and financial risks are often quite low.

There are also good reasons for selling technology, such as :

- a) Increasing return on investment
- b) Technology may not have immediate use.
- c) Technology has already been utilised up to its limit.

Therefore, technology transfer occurs because of existence of 'Buyers' and 'Sellers'.

The sellers are called "transferers" or "licensors" and buyers are called "transferees" or "licensees". Therefore Technology transfer is simply the acquisition and use of knowledge. There is no transfer of technology unless and until technological knowledge is put to use. Technology transfer is not restricted to scientific and engineering items. The manufacturing, marketing, distribution and customer service are among the factors that are included in the technology transfer.

The key factors in technology transfer include

- 1. Transplantation of technology:** involves shift from onset of well defined conditions to another set in which at least one key variable may differ. Secondly the recipient may apply the technology to a different purpose from that of the supplier
 - 2. A sense of opportunism** prevails in technology transfer, whether **justifies or not.**
 - 3.** The transfer process embraces a rich variety of mechanisms and relationships between recipient and donor(Supplier of technology). The process can vary from a routine people less passive transfer to turnkey contract where the donor takes the full responsibility for all phases of the contract.
 - 4. The nature of the transferred technology** and how it is transferred car critical to the success of the technology transfer process.
- Technology transfer may begin as a solution to some one's problem. Adoption of such 'outside solution to solve an inside problems is technology transfer. The advantages lies in avoiding 'reinventing the wheel'.

Dimensions of Technology Transfer

- The time and resources required to transfer a given technology depends upon :
 - • What is actually transferred
 - • The mode of transfer.
 - • The absorption of transfer
 - • The absorption capabilities of the recipient enterprise.
 - • The capabilities and motivation of the supplier enterprises.
 - • Technology gap between supplier and the recipient.

CATEGORIES OF TECHNOLOGY TRANSFER

- International technology transfer
- Regional technology transfer
- Interfirm technology transfer
- Cross industry technology transfer
- Intrafirm technology transfer

The flow of technology from one company to other company is called technology transfer.

There are following main types of technology transfer.

1. International Technology Transfer

Here technology flows from a fully-advanced industrial country like USA or UK to less-developed countries like India or Ethiopia.

It may occur due to the following reasons.

- (i) Countries like USA and UK may set up their companies in Indian Soil. This is because they want to take ample advantage of cheap Indian labour, and tax-deductions.

Our scientists and engineers working in these Multi-National companies may learn about sophisticated machines and latest technology through their work experience.

Sometimes they may come and work in Indian companies while working in Indian companies they may apply the sophisticated technology of American multinational Companies in Indian companies.

Thus Indian people know about foreign technology.

- (ii) International Seminars and Conferences. For example, IIT Mumbai may host an international seminar in the field of say power electronics.

Reputed scientists from Stanford university and Michigan university may come and deliver lectures about recent research they have conducted.

The Indian students and professors who attend these conferences may get through knowledge of latest advances in the concerned field (Say power Electronics).

IIM-Ahmedabad may hold a business conference on certain recent topic. Professors from Harvard graduate school of business management, Cornell, North-Western University, Kenan-Flagler business school may come and give lectures, on their discoveries.

Indian business school Students may learn a lot about latest research results.

A live Example

Recently marketing Guru Dr. Philip Kotler (professor at SC Johnson School of management) had arrived for a brief conference of marketing management at Mumbai.

He is a world renowned authority in marketing authority in marketing management. He answered to the questions of Indian business schools on online. The business managers learnt a lot from him

(iii) Technical Journals

Harvard business review, Industrial engineering journal etc. publish various recent research results in their journals.

Scholars and students can set tremendous knowledge by reading. These Journals

2. Cross Industry Technology Transfer

This is a channel in which technology flows from one sector to another. The NASA of USA publishes it's research findings in a journal called tech brief magazine. The industry people can read that magazine and acquire knowledge about latest research results.

NASA has set up it's technology transfer center at Georgia Institute of Technology. Industrial engineers and electronic engineers can acquire knowledge about recent happenings from the Georgia institute, transfer center.

REVERSE ENGINEERING CHANNEL

Here a host may become capable of breaking the code of company's product and become capable of producing of a duplicate of original product. Live Compaq had all the knowledge required to produce a PC except one piece of technology the Read only Chip (ROM), IBM was legal owner of that chip.

Compaq purchases the chip and hired some capable scientists to produce a duplicate to IBM's chip. The chip was duplicated and Compaq could produce it's own PC at a much lower cost than IBM.

Compaq earned billions of dollars in sales, since it's computer was an instant hit.

But one should remember that it is just an IBM-Clone.

CHANNELS OF TECHNOLOGY FLOW

- GENERAL CHANNELS
- REVERSE-ENGINEERING CHANNELS
- PLANNED CHANNELS
 - a. Licensing
 - b. Franchise
 - c. Joint venture
 - d. Turnkey project
 - e. FDI
 - f. Technical consortium & joint R&D

ROUTES OF TECHNOLOGY TRANSFER

- The principal routes of enterprise-to-enterprise technology transfer are
- **1. Licensing or Franchise :** Licensing and franchise arrangement vary from a complete package of instructions, technical assistance and training to mere permission for the manufacturer and sale of a product.

- **2. Supplier of materials and parts :** Supplier of materials and parts are often willing to provide a full range of technical support, information and manufacturing know-how and they can be effective in know-how, and they can be as effective in know-how transfer as in industrial licensing arrangement. The manufacturers of colour TV sets in India are a classic example of this type. The manufacturers did not have formal technology transfer agreement but has an understanding with the foreign suppliers of materials and components regarding technical assistance in production.

- **3. Equipment supplier** : A variety of technological services are provided by equipment suppliers, including operational and maintenance procedures and even processing know-how (Typical in chemical industry). Some technologies are machine based and therefore the know how is transferred along with supply of plant and equipment.
- **4. Outright purchases** eg of turnkey plants or of complete manufacturing and operational specification drawing know how, performance data and technical assistance.

- **5. Acquisition** of the company or business owning the technology
 - **6. Joint ventures** with the technology owners
 - **7. Franchising of trademarks** and technical, management and marketing know-how.
 - 8. Combination of variations of any of the above.
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- Transfer capability and motivation of enterprises supplying the industrial technology have an important bearing upon the effectiveness and efficiency of technology transfer. The competence of the transfer agents, including their ability to design an easily transferable technology package, is an important factor. The supplier enterprises and its transfer package represents a combination of documentation, training and technical assistance. Motivation of technology supplier depends largely on the transfer mode and potential return the supplier hopes to realise from an effective and efficient transplant.

Technology transfer of mushroom spawn production as done by 'Eco-care & Aware'

- **Eco-care & Aware** is a not for profit support service organisation providing training, support, service / consultancy and agro-allied technical support to development sector. Support service includes project planning and formulation of development project, technical support during implementation, monitoring and evaluation, training and capacity building, study and research, micro planning and PRA (Participatory Rural Appraisal). The organisation also provides agro-allied technology transfer support so as to boost rural and urban livelihood towards wealth creation to the society as a whole. One such agro-allied technical transfer support as provided is the technology of mushroom spawn production.

- Unlike agriculture, mushroom seed / spawn production involves sophisticated technology with high investment requiring laboratory and equipments with accessories. The major constraint in the mushroom production is the non-availability of spawn. The technology of spawn production technology as transferred by 'Eco-care & Aware' is through the route of equipment supplier and training. It supplies the necessary equipments and other accessories required as well as provided training for 15 days for one complete cycle of production at laboratory site of recipient. So it can be a form of total manufacturing and operational technology transfer including equipment as required.

- To popularise this technology the organisation uses the latest web base awareness and publicity medium. It has created one webpage- <http://www.mushroom-spawn.com/> describing its technology, services and the cost norms of transfer.
- For universal awareness it uses the Google contextual and search engine ad media so that people can know that a low cost spawn production technology is available in the nearby including the training and know-how transfer for the same.
- This webpage <http://www.mushroom-spawn.com/> also detailed its objective, requirements and equipments and accessories that are required for setting up on cost effective spawn production unit.

Merit of this route of technology transfer:

- 1. Equipments along with know-how transfer facilitates the recipient organisations, institutions or individuals for better serving its production or business purpose.
- 2. Quick dissemination of spawn technology help in easy availability of mushroom spawn facilitating the poor farmers to produce mushroom to earn their livelihood.
- 3. Web based publicity technology made this technology available for the recipients within the figure tip search in the Internet search- Google, yahoo etc.

- <http://innodigest.com/technology-transfer-methods/>
- https://books.google.co.in/books?id=b01hZDX5IW8C&pg=PA81&lpg=PA81&dq=code+of+conduct+for+technology+transfer+in+india+ppt&source=bl&ots=ukNSYEafjU&sig=ACfU3U3o54f-3cvfH8k_53FGSWnMapB2kw&hl=en&sa=X&ved=2ahUKEwi6sILOvpjqAhVMzTgGHSDmAesQ6AEwDnoECAoQAQ#v=onepage&q=code%20of%20conduct%20for%20technology%20transfer%20in%20india%20ppt&f=false

- <https://www.slideshare.net/tabrezahmad/law-of-technology-transfer-and-interlinking-issues>

Pricing of TT agreements

- <http://www.iitk.ac.in/dord/data/mou5.pdf>
- Methods of making payment
- Down payment
- Fees
- Royalties

Process of negotiation for price of technology transfer

- Planning
- Preparation of negotiation
- Preparation of draft Agreements
- Consider organizational aspects of negotiation
- Selecting method of negotiation
- Negotiation techniques & tactics

Technology Transfer Agreement

- Agreement is the agreement between the licensor(seller) & the licensee(buyer).
- Requirements from licensor:
 1. Access to R&D
 2. Exclusive & inclusive rights along with IPR
 3. Training
 4. Maintenance of secrecy
 5. Provide assistance to licensees staff on technology
 6. Update & improve technology

- Title of licensor
- Settle legal disputes
- REQUIREMENTS OF LICENSEE
 1. Secrecy
 2. Standard quality
 3. On time payment of loyalty
 4. Access to factory/enterprise whenever required
 5. Minimum output
 6. Max technical & managerial standards & facilities

- **Technology Transfer Agreement**

- This contract is used when a company (Licensor) assigns or licenses to another (Licensee) registered industrial and intellectual property rights (patents, utility models, trademarks, copyright etc.) as well as technical assistance and know-how. In the first case, knowledge and exclusive rights are granted, which are recognised and registered in order to manufacture and market products, whilst in the second, knowledge is transferred which has no legal recognition, but that does have a value in itself. As in the Trademark License Agreement, in the technology transfer contract the price for the assignment of industrial and intellectual property rights, as well as the *know how* is initially paid a certain amount of money (fee) and during the term of the contract a percentage (royalties) calculated on the amount of the sales of the products under license, made by the Licensee.

- The fees for technical assistance services are paid individually for each service rendered. The Technology Transfer Agreement is increasingly being used in technological cooperation strategies through which companies endeavour to enter into competition in certain sectors or markets but without having to develop internally the technology necessary for that purpose and that which is acquired through this type of contract to R&D+ i companies

- The Technology Transfer Agreement covers the situation where a manufacturer (Licensor) licenses a package of information, Intellectual Property Rights, technical assistance or know how to a licensee company. The licensee can then manufacture and distribute the products in a defined territory using the licensor's technology.
- In the most important aspects of the contract (technology, exclusivity, royalties, termination of contract, applicable law and competent jurisdiction, etc.) different alternatives have been provided, for the most appropriate one to be selected according to who drafts the contract (Licensor or Licensee).
- This Technology Transfer Agreement can be used for domestic transactions in which the Licensor and Licensee are based in the same country. When both Parties are in different countries the International Technology Transfer Agreement should be used.

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- This is a model of contract to be used by companies for technology transfer, either through granting intellectual property rights (patents, trademarks, utility models, industrial designs) or technical assistance and know how. In the first case, the intellectual property and exclusive rights are granted, acknowledged and internationally registered, in order to manufacture and trade products. In the second case, the contract deals with the transfer of intellectual property which has no international legal recognition, but does have intrinsic value.
- In the most important aspects of the contract (technology, exclusivity, royalties, termination of the contract, applicable law and competent jurisdiction, etc.) different alternatives have been provided, for the most appropriate one to be selected according to who drafts the contract (Licensor or Licensee).
- This International Technology Transfer Contract is designed for international operations in which the Licensor and Licensee are in different countries, but with slight adjustments can also be used for domestic transactions in which both are located in the same country.

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Signatures

Annexes

- <https://www.sethassociates.com/technology-transfer-agreements-in-india.html>
- http://www.nbpgr.ernet.in/pgs-503/015_tech_transfer_learn_from_USA.pdf
- <https://dst.gov.in/technology-development-and-transfer>