

Optimizing Technology Transfer

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Why Technology Transfer

For any production process or provision of a service, technology is an important input. Without the help of technology, no organization or individual could produce a product or provide a service. Moreover the quality of the product or service, would substantially depend upon the quality of technology employed. The profitability of an organization is linked not only to the resource availability and its optimum utilization but also to the technological content of its products and services. There have been instances, where financial and analytical parameters projected a sound growth of an organization but because of use of poor quality of technology it performed badly. A good technology is, therefore, sine qua non for good performance of an organization.

Sources of Technology

The question arises from where to get a good technology. Possible sources for technologies are:

1. Acquire the technology from outside the organization either from abroad or indigenously
2. Develop the technology in-house
3. Get the technology developed from outside the organization such as R&D laboratory, a technical institute, a manufacturing organization, experts etc.

Which alternative to use when?

There are many considerations for development of technology in-house as against sourcing of technology from outside. In-house development is preferred in cases where:

1. Technology is to be kept strictly confidential
2. There is enough time and also resources available within the organization
3. Technology is very closely held and is not available easily. In such cases, it becomes imperative to develop the necessary skills in-house
4. The cost of technology is very high. Also the terms of agreement proposed by the collaborator are unacceptable.

No company, in general, is self sufficient in all its technology needs. It does require, outside support to meet its technology requirements. Main reasons for acquisition of technology from outside are:

1. It is too expensive to develop technology in-house.
2. It takes too long to develop technology in-house

3. The company does not have the capability, infrastructure resources to develop technology in-house
4. Technology is available on attractive terms from outside sources. It is perhaps not necessary to re-invent the wheel.
5. Customers prefer a particular technology or insist on back-up guarantee from a collaborator.

Competitors have access to contemporary technology either through collaborators or through principals.

It is obvious that while indigenous development of technology is very desirable for growth of technological reliance, it is not always possible to develop all technologies locally, specially in areas where in-house development is too expensive or would require a long time. It then becomes, inescapable to acquire technology from other sources.

Complexities in Technology Acquisition

The process of technology acquisition is a complex one and requires specialized knowledge and experience in this area. A few important issues are:

1. Technology acquisition is unlike acquiring machinery or raw materials or any such commodity. It is not a one time relationship, as is generally in such cases, but a long one.
2. A technology package has many components such as design parameters, operation process parameters, quality control, material specifications, training,

research and development aspects, and many more. Acquiring them as a package or otherwise is rather complex.

3. Changes in technology, in future, are not known, but they need to be negotiated and decided upon now.
4. There are no standard or published price lists for technologies
5. It is difficult to ascertain sources of technology suppliers and their quality of technology
6. There may be a tendency of technology suppliers to off load that technology, the products from which may not be remunerative. In other words there is a danger of a technology being supplied which is obsolete or is going to be obsolete soon.
7. It may be difficult to precisely evaluate technology.

After careful consideration of all factors involved, if the company decides to acquire the technology abroad, following important steps would be involved.

Steps in Technology Acquisition

Major steps involved in a technology acquisition process are:

1. Identification of technology need
2. Sources of Technology
3. Technology evaluation

4. Negotiations

5. Agreement

The key elements involved in the above process would be:

The first step is to identify the need and exact component of technology that is to be acquired. For this a detailed study of the company's own capabilities, strengths and weaknesses would be involved. For instance, if a company has certain plant and machinery already installed, it may like to choose a technology that would require minimum addition of plant & equipment. In another case, if the company is already manufacturing a particular product and wishes to acquire technology for a higher size, may be, only drawings and designs of the higher size of equipment would suffice, instead of entering into a full fledged agreement for a whole range of equipment. This would obviously reduce cost. In other words, the company has to decide on the need for specific technology and the nature and components of technology to be acquired e.g. if it would go in for a joint venture or licensing arrangements or would it like to acquire only drawings and designs or the services of experts or mere vetting of the package which might have been designed and developed by the company.

Once it is clear what is to be acquired then the next step would be from where to acquire. The possible sources of technology could be other manufacturers, R&D organizations, technical institutes or experts. There could also be possibility of an appropriate mix. In addition one could also go in for part procurement and part development. While sourcing the technology from R&D organizations and academic institutes, one should keep in view that it is likely to be cheaper as compared to technologies from manufacturing organizations. This is so, because

while technology from a manufacturer would be commercially proven, from an academic institute or a R&D organization it would, in all probability, be at the laboratory or bench scale and may require considerable efforts to scale up to commercial level. While there may be considerable risk but the big advantage would be getting a technology, which would be at the evolving phase with sufficient growth potential.

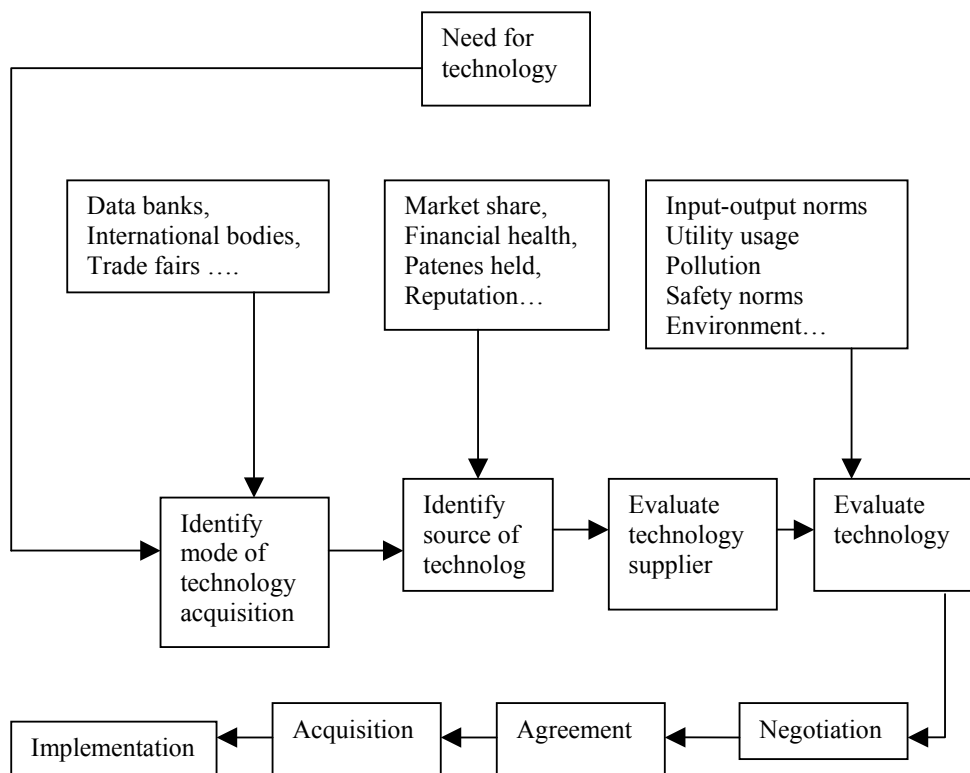
Sourcing a technology from a manufacturer has the advantage that being a fully proven technology would ensure successful commercial production. But the cost of technology may be relatively high. A major disadvantage would be that the technology may not be the latest. Generally, when a technology is in its emerging phase, a manufacturer would be most reluctant to create another potential competitor by selling its technology.

All possible sources of technology should be identified. Since technology has no fixed price, identifying a large number of sources and then negotiating and getting the best price would be a good strategy. Possible sources of information on technology supplies are: data banks, directories, industry and trade associations, exhibitions, trade fairs, international organizations such as UNIDO, APCTT, Govt. information systems and others.

The standing of the technology supplier needs to be ascertained. This would be in terms of its integrity, reputation, rating amongst past buyers, the level of expertise in the area, its share of the national and international market and other parameters. One should also take into consideration the package offered by the supplier covering features like guarantees offered by the supplier, training support, marketing, buy

back arrangement, support in R&D, intellectual property should figure carefully in the evaluation.

The offers obtained from technology suppliers should contain information such as the content of the technology package, quality and efficiency of technology, payment terms, commitment with regard to technology absorption and adaptation, assistance in establishing R&D set up, patent rights etc.



The Technology Acquisition Flow

Technology should be evaluated from a multiplicity of considerations. Some of these would be: price, suitability to local resources, raw materials etc, ease in

production and maintainability, efficiency of technical, environmental and pollution aspects, safety and health, water and other utilities utilization and energy efficiency considerations. Some times a technology supplier may not provide certain crucial information to enable evaluation of certain critical parameters. In such cases, a disclosure fee may be required to be paid to the potential supplier to part with the information.

Negotiations may now be held to get the best terms. Negotiations for technology acquisition are quite difficult. A suitable strategy needs to be adopted. Appropriate preparation before the negotiations is very necessary. Enough thought should be given to draw up an effective negotiating team consisting of specialists dealing with technical, financial and legal aspects. Representative of an in-house R&D may also be included. The leader of the team should be carefully chosen.

Efforts should be made towards a best buy. An important point that may be kept in view is that technology payments in the form of licencing, engineering fee, royalty etc are not the only payments. There are others associated with it in the form of machinery, components, raw materials and intermediates, catalysts which a technology supplier may insist, to be procured from them only or from a specific source/sources suggested by them. In fact, such implicit payments are generally several times more than the payment for the technology per-se. One has therefore to be aware of such situations and take appropriate steps while negotiating.

Once negotiations have been successfully completed and agreement reached, all aspects should be suitably incorporated in what is called in common parlance, a Technology Transfer Agreement. This perhaps is one of the most important step and would require considerable attention of the management. The content of the

agreement would vary from one transfer arrangement to another and there is no one agreement, which is applicable to all across the board. However, international bodies such as UNIDO, APCTT and others have given outlines of such agreements, as guide.

The basic objective of the agreement is that whatever has been agreed to by the two parties, is put down in writing so that any misunderstanding or disputes are avoided. Good and harmonious relations are very important for a successful technology transfer. Therefore, as far as possible, disputes should be avoided. An agreement is an effort in that direction.

While it may not be possible to list various provisions that may be kept in view the major ones are:

Definition: The technology, the process, technical services etc. being transferred should be clearly defined and specified

Technology Package: This should clearly specify as to the services that would be rendered by the technology supplier, such as process parameters, designs and drawings, quality assurance techniques, specifications of raw materials, training etc.

Payment: It is important to include provisions in the agreement about the amount, manner, modes, currency and schedule of payment. Important milestones for the releases of payments should be specified.

Duration: The duration for which the agreement would be valid, should be specified

Access to improvements in Technology: The agreement should clearly specify the availability or otherwise of any improvements in technology that may take place either at the supplier or at the receiver's end during the currency of the agreement.

Guarantees by the supplier: The technology supplier should guarantee the performance of technology, failing which the supplier should indemnify the buyer through suitable remedial measures, such as rectification, compensation etc.

Rights and obligations: Rights and obligations of the buyer and seller should be clearly specified in the agreement. It will help both the parties in smooth transaction of the agreement and avoid disputes and litigations.

Indemnification: It is desirable to include a clause in the agreement, making the supplier of technology to indemnify the purchaser in respect of any infringement of the third party's rights protected by a patent.

Exclusivity or non-exclusivity: This refers to the extent of right for the use of technology. A technology transfer agreement may be exclusive, conditional exclusive, exclusive for a region or non-exclusive. The quantum of payment is also linked to the extent of the right granted to the buyer. The agreement should, therefore, adequately cover this aspect.

Force Majeure: While there would be genuine efforts of both the parties to honour their respective commitments, but at times circumstances may render it difficult for either or both the parties to fulfill certain obligations. It is, therefore, desirable for the two parties to include, in the agreement, situations where obligations are difficult

to be honoured and in such situations, the compensation to be provided, if any. The circumstances could be acts of God, riots, strikes, lockouts etc.

Arbitration: In the interest of both the supplier and the acquirer it is important to include provisions in the agreement regarding amicable and quick settlement in case of disputes or differences that may arise during the operation of the agreement. Arbitration is considered an appropriate method for settling such disputes. Mechanism for dispute settlement should be clearly specified.

Governing Law: It is important to specify the law that would be applicable in case of disputes.

A good technology transfer process would be a win-win situation both for technology buyer and technology supplier.

Benefits to technology supplier:

Main benefits to technology supplier are:

- Financial returns
- Entry to a new market
- Possibility of orders for equipment, raw materials, components & others
- Integration of operations through forward and/or backward linkages
- Possibility of access to improvements

Benefits to technology receiver

- Availability of technology which would otherwise be difficult to develop
- Entry into new area
- Expansion/Diversification of business
- Possibility of buy back arrangement
- Financial returns
- Strengthening technological capabilities

To sum up

Technology acquisition is a complex process requiring special skills, knowledge & experience It is a major managerial responsibility and should be undertaken with patience, tact, will and efficiency.