

## Technology Transfer and Domestication in the Arab World

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Due to the growing role of technology and its impact on increasing the effectiveness of production elements, upgrading competitiveness of products manufactured or services rendered and opening doors for industrial product to penetrate new or existing markets now more than ever, technology acquisition has become closely associated with economic development and growth.

The coming years will undoubtedly witness a radical development in the transfer of technology into and from the Arab region, at both private and public levels as technology transfer is increasingly being recognized as a strategic option and an essential alternative for the self possession, acquisition and development of technology to be commercially utilized as long as the local reserve suffers shortages in the existing technology.

Parallel to this active role of technology transfer in supporting economic development and advancing local industries and structures, there is a hazard that must not be overlooked, which is falling in the loop of subordination and dependance on technology owning countries exporting their technologies to the Arab region. More often than not, such countries impose restrictions that limit the capability of technology transferees to optimally utilize it, leave alone developing it. This situation would maintain the relation of subordination and dependence on what those countries offer and not on what we can develop, losing thereby our own ability to develop technology and thus remain technology consumers rather than producers.

In order to avert this danger, Arab efforts are being directed towards raising awareness for technology transfer as a concept, and the challenges it imposes on small and medium sized industries and developing countries on a higher level, and emphasizing the necessity to domesticate technology and not only suffice by its transfer.

Domestication of technology in its own right is a goal that would be realized through the transferred technology's integration into already existing knowledge and technologies, and the adaptation thereof to meet local environment requirements, with the ultimate objective of benefiting from and developing such technologies into new locally produced technologies more capable of fulfilling local needs and supporting economic development.

Technology domestication is a multi-stage goal, where the accomplishment and success of each stage depends on the other, starting from obtaining a license for the technology, ending up with its development into a new locally owned technology.

1) The first and most significant step of technology transfer and domestication is importation. This step consists of three essential phases, namely: strategic planning for the technology transfer, contract conclusion, and technology mobilization and deployment.

#### a) Strategic planning

If we look at technology in-transfer as the alternative to compensate for the shortage in the self owned technology, then this means that technology importation is certainly a strategic option that aims at realizing a specific purpose, such as work maximization or development, increasing corporate competitiveness, etc.

Making a decision to import a given technology should be based on numerous specialized studies and within a strategic work plan that define practical steps to guarantee the achievement of the prescribed objective and desired purpose from the transfer. Such studies include market and feasibility studies, which give indicators as to the feasibility and viability of the project where the technology is to be employed, taking into account offer and demand indicators, competition, marketing channels and price factors, as well as the required investment and other financial factors such as projected loss and profit. These studies should be carried out in line with the study of the entity's own technical, financial and human capacities in order to determine its ability to employ such technology and to identify which of these main factors constitutes an obstacle to technology transfer to address it and prepare the necessary and appropriate environment for the technology.

On a different level, local legislations usually have a role to play in the process of technology transfer manifested in terms of their applicability to the technology subject matter of the transfer. It can be seen in the form of formalities enforced or restrictions imposed on transfer requirements meeting certain terms and conditions under applicable laws and regulations. An example is the requirement to obtain a license from a certain governmental entity or to test and obtain approval of the technology by a third party guaranteeing its conformity with local specifications. Studying the legislative environment pertinent to the technology is, in itself, another prerequisite to ensure a successful transfer of technology.

Having determined that the license for a technology fits into a given company's core strategies as well as capabilities, and the governing legal environment, the second most important step to consider is finding the 'strategic' partner with whom to collaborate, whose own capabilities complement the other party's and who are reliable to hold up their end of the bargain. The 'strategic' partner concept includes many standards, such as the extent of success of such partner, technical capabilities, technological specifications and degree of development, and legal protection thereof.

Locating such partners is, thus, a stage that requires a lot of data searching, gathering and analyzing, and often involves assistance from specialized mediation and networking companies who have the capabilities and means of identifying and connecting technology owners with technology seekers.

#### b) Contract conclusion

If we look at technology transfer as a process of importing (or exporting) a set of technologies and know-how, whether through licensing or other means, from a technology owner to a technology importer, it means that technology transfer by itself is a legal relationship between the technology

owner and technology importer, governed by a contract concluded between the two parties. The contract defines the nature of this relation and the rights and obligations of both parties. The stronger party in this relation, often and more common, the technology transferor, usually seeks to impose contractual terms of abusive form and content, that the weak negotiating positions of the transferees leave them little option but to accept. As a result, the formulation of legal relation between the transferor and transferee requires technical, financial, and legal knowledge and awareness by local parties in order not to fall victim of the transferor's imposed conditions. Two main types of professionals are generally needed to do licensing: a patent attorney (for intellectual property issues) and a licensing professional (for finding and negotiating with partners). Accordingly, a negotiator of a licensing agreement should refer to negotiation experienced individuals in order to reach more just and favorable contractual terms and conditions better guaranteeing their rights and protect their interests. Special emphasis and effort need to be placed on the transferees' rights to make, amend and developed the transferred technology, as an essential factor in the process of technology domestication.

#### c) Technology working and implementation

The third phase in technology importation after the development of a strategic plan and contract conclusion is the transfer and utilization of the technology in accordance with the provided working instructions. This phase requires, fore mostly, the availability of human resources capable of carrying out this task based on the knowledge and technical support to be provided by the technology transferor, which is necessary for the application of technology in the most effective manner.

2) The second stage in technology transfer and domestication is manifested in a need to building an infrastructure capable of absorbing and implementing the technology subsequently leading to its domestication and development. This is an indispensable stage the accomplishment of which inevitably requires close cooperation and coordination between the efforts of scientific research and development centers and continuous support of the physical requirements for the transfer such as machines and equipment, the technical requirements of practical and theoretical experience and skills necessary for technology employment and development, and the legal requirements of legislations and human capacities capable of regulating and forming legal transactions for the transfer and utilization of the technology.

This stage necessarily requires us to reconsider the educational bases and teaching curricula of the Arab region to keep them in pace with international advancements, and to proactively seek after having more institutionalized government bodies, and developed scientific research and development centers, supported by all necessary resources and by regulatory frameworks designed to determine, implement and develop research, production, and financial policies in addition to and legal legislations, most notably for intellectual property laws.

3) The third stage in the transfer and domestication of technology process is adapting the technology to the characteristics and requirements of local environment. This is a stage that normally requires accommodating the

imported technology and supporting it with further research and development in order to effect the required conversion, either to the technology itself to be more suitable to local environment or to the elements of local environment to be more adapted to the imported technology.

The speed of moving to the third stage is dependent on the extent of preparatory research conducted prior to and during importation process. Such researches make it possible for the technology to be quickly accommodated and well managed after transfer.

4) Last but not least, with close coordination of the above elements, endeavor should be made to create supporting and nurturing technology; produce and develop local machines and equipment, with the objective to develop the technology imported in previous stages. This stage is dependent on the successful accommodation of the technology and the ability to develop it, all the way to the ability to create new technology either through simple combination of available resources or the introduction of new addition that lead to creating distinctive technological products.

Fulfillment of this stage represents the actual beginning of the process of technology domestication.