Effective Factors on Efficacy of Transferring Technology 
(Case study: Oil Exploration Management)

Fatemeh Panahi (corresponding author) 
Executive management group, Damavand Science and Research branch, Islamic Azad University, Damavand, Iran 
panahifatemeh@yahoo.com 
(+98)9123952282

Dr. Hassan Najafi Solari 
Executive management group, Damavand Science and Research branch, Islamic Azad University, Damavand, Iran 
ajafi.soulari@yahoo.com 
(+98)9121126227

Abstract

Transferring and importing technology in the third world countries is sophisticated issue both according to scientific aspects and cultural-political and economic aspects of many west research and international communities. Technology levels in advanced and the third world countries are significantly different. In order to reduce this distance, transferring technology is undeniable necessity (Arabi, 2008) in Iran, according to political change in country and intention to probable investment in great foreign oil companies and noticing that oil exploration industry is one of the most principal industry and state economic infrastructure in Iran, recognition accurate technology transferring methods and identification effective factors on effective transferring technology seems necessary. Therefore, this research determined various models of transferring technology besides effective factors on efficacy of transferring technology in oil exploration field. For this purpose, a model was proposed and the relationship among variables was examined. In this regard, a questionnaire surveying was conducted in oil exploration company. Data was investigated using SEM and CFA. Results showed that supporting from transferring technology, ability to learn oil exploration industry, and technology infrastructures are effective on efficacy of transferring technology in oil exploration industry.

Keywords: technology, transferring technology, efficacy, oil exploration management.
1- Introduction
According to incremental technological evolutions to synchronize with regional and transregional competitors, oil industry and especially oil exploration management don’t have any way just importing technology from technology owner countries then nationalizing and developing it in state. In this research, first models that examined efficacy of transferring technology in national level or a part of it were checked and later model of this research are introduced in oil exploration industry.

2- Investigated Frameworks and models about Transferring Technology
Reisman provided a classification for transferring technology whose aspects include players, transferring features, transferring motivations, and related scientific fields based on which transferring technology can be planned (Arnold, 2004).
Catalonia model investigates efficacy of transferring technology in 5 factors of environment, players, structure, process, and function of transferring technology which is obtained by market models adaptation. (Catalone & Gross, 1990).
In Pieterse model, a successful steps of transferring technology is indicated from beginning to the end and it was claimed that doing these steps lean us to a successful transferring technology. These steps start by definition of needs and identification technology owners and end to technology development and training developed technologies (Pieterse & Pretorius, 2002).
Malik simulated transferring technology to a radio system that needs to receive message from sender. This model is a simple transmittance model to transfer technology (Malik, 2002).
Kumar model investigates effective factors on increasing the abilities of companies in the third world countries to increase their technological abilities. In addition, three factors have main role in increasing ability in this model including government role, mechanisms to transfer technology, and technological infrastructures (Kumar & Persaud, 1999).
In Lin and Berg model, concentration is more on cultural differences in transferring technology process, this cultural difference with technology nature and international experience of both parties about transferring influence on satisfaction and efficacy of transferring technology (Lin and Berg, 2001).
Finally, in provided model to describe transferring technology process in oil industry in Libya transferring technology country by Mohammad et al., 2 factors classification including output and mechanism of were identified. Variables are as following: supporting transferring technology, infrastructures of transferring technology, environment of transferring technology, participatory and interactive learning ability, and utilization from transferring technology (Mohamad, A.S and et al, 2010).

3- Selecting Conceptual Model of Efficacy of Transferring Technology in State Oil Exploratory Industry
According to analysis level of this research and existed models, and importance of technology transfer for oil exploration industry, variables of “supporting transferring technology”, “technology infrastructure”, “ability of industry learning”, “environment f transferring technology”, and “efficacy of transferring technology” were extracted by the provided model by Mohammad et al.. Figure (1) shows models and its factors.
Iran support from transferring technology can be classified in two main following cases:
1- Separation governmental (regulatory) and operational (utilization) role
2- Selecting proper policies and laws for facilities and efficacy of transferring technology (Mohamad, A.S and et al, 2010). In Iran governmental role separation was practiced by utilization in 1979 and establishment oil ministry. It was tried by designating oil law in 2011 to have full separation and second factor is related to governmental support from transferring technology by selecting laws and policies that facilitate transferring technology (Tabatabaeian et al., 2013).

Environment of Transferring Technology
Generally this variable answers this question whether host country is able to accept and attract foreign technologies or not? (Mohammad et al., 2010) It should be answered that no proper infrastructures are built for effective transferring technology. (Tabatabaeian et al., 2013)

Ability to Learn Industry
The fourth variable in conceptual model of this research is ability to learn industry. Learning industry encompasses all levels. (Armstrong & Folr, 2003)

Efficacy of Transferring Technology
Efficacy of transferring technology accelerates importing technologies and ability to develop them and create new knowledge (Arasti et al., 2008)
4- Methodology

Data Collection

Data was collected in this study by oil experts. The objective group includes managers, seniors, experts, and employees of oil exploratory management that are about 300 and the mentioned population is homogenized. It means there is no difference among participants. In addition, since 169 questionnaires were distributed among them, questionnaires totally have 33 questions.

In order to analyze the collected data and relationship among research variables “SEM” and particularly path analysis technic using SMART PLS software were used, before entering data to test and research conceptual model, CFA was used to confirm accuracy of exogenous and endogenous variables of the measured models.

5- Data Analysis

Investigating Research Diagram (model test and Approximation):

Diagram (1): Research model in standard coefficients estimation

Diagram (1) shows research model in standard coefficients estimation. In this diagram, numbers or coefficients are divided in 2 classes. First class is implicit variables (oval) and explicit variables (rectangular). These equations are so-called loading factor. The second class is structural equations which is the relationship among hidden variables and are used to test model. These coefficients are called path coefficient (Human, 2009). All loading factors more than 0.5 showed that researcher wants to evaluate them by this research0made instrument.
Diagram (2): research model in significance level (t-value)

Diagram (2) shows research model in significance level (t-value). This model actually tests all measurement equations (loading factors) and structural equations using t-test. In addition, the calculated t values for each loading factor, structure, or hidden variable is higher than 1.96.

**Results of Structural Equation Model**

The obtained results from SEM and path analysis technic showed that “technology infrastructure has significant effect on efficacy of transferring technology” In addition technology infrastructures has direct and positive effect on efficacy of transferring technology. Therefore, oil exploratory management can significantly help to development and expansion of necessity technologies besides evaluating it to get oil industrialization by selecting an expertized team in transferring technology field and having necessary authorities to them. On the other hand, environment of transferring technology doesn’t’ have significant effect on efficacy of transferring technology. It means no significant relationship was seen between environment and efficacy.

In addition, “supporting transferring technology is significant on efficacy of transferring technology”. It can be claimed that supporting transferring technology has direct and positive effect on its efficacy. Therefore, government and senate can select a group of experts for effective transferring technology in oil exploration management and designation precise bills and laws to prepare conditions for this fact.

Moreover, “ability to learn oil exploration industry is significant on transferring technology”. It can be stated that ability to learn oil industry has direct and positive relationship with efficacy of transferring technology. Therefore, oil exploration management should have more focus on increasing learning ability especially organizational learning.

6- Research Final Model
According to test results, research final model as effective factors on transferring technology known in oil exploration industry are as following:

![Diagram](http://www.ijhcs.com/index.php/ijhcs/index)

**Fig. 5-1: research final model after testing hypotheses (model of efficacy of transferring technology in state oil exploration industry)**

I

7- **Conclusion**

Findings of this research are as following:

- Precise planning to promote organizational educational level should be considered to use necessary technologies and also high quality educational periods about technology and its transfer in oil exploration management. To research this purpose, this management can know oil competitors very well by selecting an expertized team including experts of education, oil exploration, etc. and get familiar with international relationships to reinforce their organizational learning. This team should identify proper and necessary technologies and nationalize and promote prior oil technologies after transferring them into country.

- According to government and senate role on efficient transferring technology, it was indicated well that oil exploration management should have better and more interaction with them. For this purpose, teamwork including experts of technology and transferring technology fields are gathered. These members should be from both government and senate members and oil exploration management to take step toward reinforcing purpose of reaching state oil industry by necessary bargains.

- In addition, changes of these environments should be investigated according to political and social aspects and remove obstacles and challenges of both environments to make such impotent cases of internal and external environment play their effective role well.
In transferring technology process, the transferor selection has important role in knowledge successful transferring. Therefore, well-knowledge and experienced teachers should be selected in transferring technology field and also be dominant on state, international proportions, and the world oil industry.

Oil exploration management after each technology can try more along with nationalizing technology, develop and expand it.

Managers of oil exploration management should design and plan long-term purposes and landscapes of each organization under “technological landscape in oil industry”. Therefore, oil exploration management can proceed and adjust this field on “oil exploration management technological landscape” and give it to oil industry. Other big organizations will be persuaded by this action and design and plan their technology landscape.

8- **Suggestions to the Further Researchers**
8-1 researchers can rank effective factors on transferring technology in oil exploratory management by AHP decision method.
8-2- investigating efficacy of transferring technology and effective technologies in state oil industry
8-3- using direct perception model, prediction procedures, holistic and strategic management to predict the development of technology in the oil industry
8-4- investigating transferring technology ways from countries having oil technology and choosing the best way
8-5- adjusting technology landscape in state oil industry along with landscape 1404

9- **Research Limitations**
This research had many limitations that some are resulted from non-accessibility to necessary information. Another reason is libraries non-corporations in providing references and hard accessibility. Anyway, it is hoped other studies in future face with less mental and theoretical limitations practically and objectively.
On the other hand, according to great importance of research background in identification effective variables on research issue, prevention from overworking, its significant role in stating problem, formulating theoretical framework, and domestic research backgrounds related to other issues is another limitation of this research.