International Academic Institute for Science and Technology

International Academic Journal of Business Management
Vol. 2, No. 2, 2015, pp. 22-39.

ISSN 2454-2768

International Academic Journal of Business Management

www.iaiest.com

Identification factors affecting Technology Absorption Capacity in the Copper Industry (Case Study in *Sarcheshmeh* Copper Complex)

Samaneh Karimi[a], Mohammad Hossein Nekouei[b], Seyed Javad Irannejad[c]

a. the writer: student of master's degree in the field of technology management, Islamic Azad University, Sirjan branch
b. assistant professor: PhD degree in the field of economic management, management group, faculty of humanities and Islamic Azad University, Sirjan branch
c. industrial advisor, master's degree in the field of planning and project control, research and development of Iran national company of copper industries

Abstract

Main purpose of this research is Identification factors affecting Technology Absorption Capacity in Sarcheshmeh copper industry. This research has applied goal and descriptive correlative method and tools of data collecting was questionnaire. The information was analyzed by illative, descriptive and statistical method and structural equations modeling and AMOS 22 software. Findings of the research showed the factors effective on absorptive capacity, internal development and research, external development and research, personnel training, innovative cooperation, and view of changes. Also there is direct and significant relation between the mentioned factors and Technology Absorption Capacity and finally some instrumental proposals were rendered for use of the results to industrial and mineral companies and corporations.

Key words: absorptive capacity, internal development and research, external development and research, personnel training, innovative cooperation, and view of changes

Introduction:

At present age, development is an inevitable case which is followed by some wide opportunities and threats in modern complicated world. Now, governments and industries knows well role of science and technology to confront with challenges and use its opportunities and show interest in innovation and research. Our country is not expected from effect of these changes and should recognize challenges and on time use of forward opportunities in order to remain in various economical fields in global market of competition until to reach to knowledge-based modern economics. (Poursoleiman, 2008).

Durability and success in economical activities have never been an easy work especially all aspects of economical activities (including overall approaches to daily operations) have been recognized from challenges and opportunities as a result of challenges of 21st century, the challenges which may be

recognized full of unpredicted events in this speeding and noisy world and opportunities which may be used maximumly. some of the most assimilationant challenges at the third millennium and age of global network include how to gain stable development, emergence of modern and developed technologies such as information and communications, change of work and institutes nature and consequently improvement of ability of decision making power, accelerating technological and scientific line breaking to improve human conditions. (Heygins, 2001)

Transfer and absorptive technology is a complicated category in developing countries which has been considered in terms of sciences and cultural, political and economical aspects by west research associations and international organizations. Technologies level of developing and developed countries has tangible distances. To decrease distance of technology in these countries, transfer of technology is undeniable necessity. Transfer of technology is possible by diffident methods and tools that are determined by position of technology transferor and transferee (Banavand, 2007). Now, selection of suitable technology for economical development, removal of fundamental needs of the state and planning for its application are very assimilationant. Rapid and sudden development of technology during last three decades and prediction of technology development in future and salient differences and backwardness of developing countries from development of technology and finally its transfer are the most rapid approaches. (Golkar, 2013)

Increase of innovation, increase of relative growth speed of knowledge, decrease of scientific and technological distance and gap, to bring an organic and systemic view in presence about process of organization development, attention to assimilationance of external transactions of organization (Golkar, 2013)

Theoretical basis of research:

Issues Expression

Our country is a developing country and transfer of technology is recommended as a cross-cut way for gaining modern technologies for these countries; provided that technology is really transferred and making locality of these technologies are also considered. During recent years, transfer of technology is considered as the most assimilationant method of technologies acquisition. But in process of technology transfer, purchase of equipments and technical documentations has been most considered and simulation and innovative learning that provide assimilation of technologies have not considered. in view point of knowledgeable persons, countdown begins from absorptive technology to market for its liquidation, therefore, transferee countries of technology have less opportunity to have a place for itself in market by complete absorptive of absorptive technology and its correctness and development and innovation in product and process; otherwise, by advent of new technologies, these countries have to pay much costs for transfer of modern technologies. At past, due to unawareness of developing countries and dominance of industrial advanced countries on flow of technology transfer, what are considered in technology transfer were machineries not technology in real meaning, therefore, technology transfer without development activities could not underlie technological development in most developing countries. This vision that developing countries don't need to development and research and absorptive technology is sufficient for them is a baseless vision (Balabadi, 2012). Now, despite past time in which technology transfer was considered sufficient due to simplicity of technology and unawareness of developing countries, process of technology acquisition is completed for buyers when that technology is reproducible by assimilation (Salehi Vaziri, 2003).

Process of technology transfer is a learning process which has some advantages and consequences. Therefore, managers should develop previous knowledge of the company and learning processes and absorptive capacity of the organization in order to increase advantages gained from technology transfer.

Ability of employees depends on professional skills and their training and consequently high motivation and ability of employees result in knowledge and skill transfer. Recent researches about "newly industrialized" countries show that role of technological capabilities in success of such countries is effective and have made them able to decrease dependence to advanced countries and dominate absorptive technology successfully. Accumulation of technological capabilities in advanced countries is fulfilled by research learning widely. Adversely, learning is fulfilled by copying process in developing countries. Some of newly industrialized countries have been able to change learning by fulfillment to learning by research. (Salehi et al, 2013)
As copper industry is very assimilationant in Iran and very assimilationant industry in Iran and has application in most industries, we are going to find what factors affect on technology absorptive capacity in copper industry.

assimilationance and necessity of research

Nowadays, technology is considered as a strategic factor for economic development of countries. In advanced industrial countries, access and use of modern technology is one of methods in gaining international power, dominance and competition. Necessity of attention to suitable technology absorptive is that it helps to managers and policy makers to have sufficient attention to all aspects of technology by which it may provide infrastructures necessary for assimilation, transfer and localization of modern technology (Valipour et al, 2012).
The world is changing and speed of this change increases day by day. Modern technologies emerge and change commercial equations. Management systems may put in these changes. The most assimilationant difference of today world with yesterday world is speed of technological evolutions. This is along with change in scope of using technology. Global competition is almost a new category. in 1980^{th} and 1990^{th} decades, global competition increased by emerging new countries in international field. from that time, balance of economic power was continuously changing. Now, most countries are experiencing open global trade. Forming commercial blocks have changed into one of significant specifications of present period. (Farahmandfar, Dabaghisadr, 2013)
Process of technology absorptive at any step needs a decision making. To absorptive a technology, some steps should be passed including project of technology evaluation, selection of technology, selection of suppliers, selection of method of technology transfer, conformity of technology with needs of industry. In any of these steps, ability of decision making by using scientific methods should be gained in addition to having full information about its details. Recognition of organization's needs is always necessary and if the factors of weak point and power of industry are recognized and used power points and improved weak points, failure of industry is minimized. If the needs are recognized, the industry should think about a new idea for producing products proportional with needs. inattention to technological innovation sometimes has caused that the industries produce products by old methods and if they don't attention to modern technologies, they will drop behind their competitors and as a result, the industry will face with some losses and result in failure of industry. (Sheling, 2008).

theoretical Fundamentals & Hypothesis of Research

Technology includes all sciences, products, tools and methods and systems that are served to provide a product or service. Technology is process of transferring and changing sources to products by knowledge, experience, information and tools. (Tarogh Khalil, 2002)
Commercial ANCATAD and development of United Nation section, technology transfer means to assimilation a special technology from developed countries to developing countries in order to enable

them to use and produce new production tools and develop available tools. Technology transfer is a process in which technology flow is realized from one source to a transferee (Tarogh Khalil, 2002).
Purpose of technology absorptive is to understand its process and technical design of equipments so that the receiver country may progress in acquisitive technology and use it according to local necessity until to transfer more advanced product to the other countries. for example, countries like Japan and Korea are able to organize their industrial production and enter into global market.
Zahra and Georg (2002) defines absorptive capacity as a set of processes and routine procedures by which a corporation may use and transfer knowledge in order to create dynamic organizational capability. These four dimensions enable corporation to reform its sources and superpose them with changing conditions of market and reach to competitive benefit. They defined potential absorptive capacity as "acquisition" and "absorptive" and real absorptive capacity as "change" and "operation".
Cassiman and Veugelers defined two dimensions for absorptive capacity: ability of determining technology market and ability of absorptive acquired technology. The first means that ability of determining exterior environment doesn't require science or complicated technology but may know the technologies used in corporations and business process. absorptive capacity also allow corporation to integrate external, complicated and unimagined knowledge into its activities and correlate with research activities.
Potential absorptive capacity: it includes ability of learning and assimilating that contains efforts of corporation for knowing value and finding external new knowledge attraction.
Actual absorptive capacity: it includes change and application of knowledge that shows ability of the corporation in change of structure of internal available knowledge and new assimilated knowledge and their integration and includes combining changed knowledge with their systems, processes, daily actions and operation. It is not only for correction of knowledge and available abilities but for creating new operations and abilities. (Rahmanian, 2010)
Pening and Harinto found dimensions of absorptive capacity that include communication channels and knowledge of IT management. While they seem separate, there is much correlation between them (Tavanbakhsh, 2012).

types of absorptive capacity

Individual absorptive capacity: it is defined as ability and effort of an individual founder or sporadic employees independently for recognizing, absorptive and using internal and foreign knowledge of the organization for benefits of company that includes resources resulting from man factors and capitals and social network of employees and entrepreneurs of the company.
Organizational absorptive capacity: it is defined as ability of recognizing, absorptive and using internal and foreign knowledge of the organization at level of benefits of company that includes elements of route dependence, environment scaling, research and development activities, flexible structure and culture of innovation. ability of marketing points to ability of the organization for offering products and services that affect on operation of company directly and acts as a medium for other variables (Farahmand, 2004)

Effect of man capital on technology absorptive:

Training as a reaction of manpower skill is an assimilationant factor in attracting direct foreign investment. The trained population has much ability to fulfill more complicated works and adjust itself with new duties. Also, training increases ability of the state in absorptive new technologies. In addition, training is a factor that causes structural change of direct foreign investment in international companies from user products to technological products. In other words, existence of trained and skilled manpower

in modern commercial organizations is an assimilationant factor and effective on flow of direct foreign investment (Riolin, 2001)

technologies absorptive and adjustment

Technology should be transferred, absorptive and adjusted and changed in the most suitable cases according to local situations for achievement of technological self-dependence. As mentioned before, the technologies that developing countries absorptive are suitable with factor capacities of wealthy exporting countries. Adjustment is process of conformity of strange technologies with local factor capacities, social customs and values and goals of national development. (Mahnak, 2003)
As technology adjustment is the means of assimilationing technology relation with national policies of research and development, the policies which are designed for mobilizing capacities for adjustment and absorptive, need to attention to create or mobilize national capacities of research and development.
Begchi believes that there are three important ways for technology absorptive and adjustment. The first one is to stimulate advantage motive meaning that economical factors will try to gain technical knowledge and use it in production flow when productions and special methods are profitable. The second important way is technology absorptive the he calls "associtionist roué" or mobilization route. Some samples of "associtionist roué" have given some pyorrhea route like silk industry in Japan at 19^{th} century. This industry included some small shops that each had specialty in several productions but usually used common facilities such as steam machines and electrical engines. Businessmen and great companies usually coordinated their work, provided row materials and credits and marketed for the product (Mahnak, 2003)
As Begchi says, the third way of technology absorptive is political mobilization. the best samples of this mobilization is when the state tries to make people ready to train themselves and most use from available sources and increase production in the state. Mobilization of local sources will be powerful tool when the states try to remove fundamental deficiencies in food supplying and when absorptives and foreign sources are not sufficient for needs of the state for example, when the state is in a war (Arabshahi, 2009)

absorptive capacity

The element by which ability of technology absorptive of companies, industries and even countries are measured is called for "absorptive capacity" and means ability of recognizing, absorptive and using knowledge from environment (Hiv, 2003). Concept of absorptive capacity in literatures of international technology transfer has been entered under title of technology capacity that not only includes search and selection of the most suitable available technology for absorptive but invention of new knowledge by investment in researches (Kohen, 1989). Technology absorptive is a process which is necessary for achieving to depth of abilities of an imported technology and most important, predisposing technological development by creating a suitable bed for using this new technology at different organizations. Technology absorptive means that when a new Technology enters into an organization, it may be a part of it and is not shown as a foreign and external element for experts. (Jafarnejad, 2009).

Murovec and Prodan model

According to view of Murovec and Prodan, the factors effective on absorptive capacity include: internal Development and research, external Development and research, personnel training, innovative cooperation, and view of change. (Murovec and Prodan, 2008)
We use this mode due to totality of Murovec and Prodan model
The factors and sub-indicators have been shown in Murovec and Prodan model in table 1.
Table 1: the factors effective on absorptive capacity of model according to Murovec and Prodan

Dimensions of technology absorptive	Indicators
Internal development & research	Research for ability of coordinating and integrating all phases of development & research processes with purpose of engineering application
	To produce and marketing for technology absorptive
	Research for studying ability of the state in the field of technology development
	development & research for product improvement for processes improvement
	development & research and provide program suitable for technology promotion for localization
	To collect and provide necessary documents, standards and instructions identical to need of absorptive technology and local conditions of the state
Foreign development & research	Skill in knowing other processes or production lines in the world
	To research for reaching to hidden technical knowledge of technology
	Continuous study of life curve of technology in the world
	Relation and use of external research organizations
	To study similar technologies and visit factories in abroad
Personnel training	Skill in installation, operation, test and use of equipments and machineries for technology absorptive
	Skill in management identical to absorptive technology, skill in solving problems related to production process
	Sufficient skill in technical knowledge which result in replacement of elements or tools or equipments used in internal manufacturing
	skill in technical knowledge which cause improvement of products
	Skill in technical knowledge which result in more dominance on computer programming, formulations, how to control devices and their relation with each other, control and organization.
	Coordination of knowledge level and skill level of internal manpower
	Term of personnel training
	Optimality in combination of internal and external training
	To hold education courses and workshops in industries of the state by specialized powers of the technology transfer project for technology absorptive
Innovative cooperation	Innovation in design and production of new products considering to needs of customer
	Mechanisms and teams of problem solving about innovation issues
	Use of previous innovative experiences in present and future innovations of organization
	To have skill which cause replacement of internal first materials instead of foreign sample

	Manpower with motivation, equipped with culture of group work
View of change	Presence of suitable technology market for various activities
	To develop internal technology market due to embargos
	To improve quality control process of product and skill in quality control
	Methods of production, planning , using, customers reactions in improvement of technology
	Equipments for replacing available factories, ability of organization in creation of technology and or fundamental improvement of available technology
	To fine machineries and improvement resulted in production with better quality and quantity than before
	improvement resulted in production by other similar methods (emphasizing on endogenous technology) (improvement of production process)

development & research

Development & research include an innovative work that is systematically fulfilled for increase of scientific supply and technical knowledge and also use of this knowledge in invention and plan of new applications (Ferimann, 1974). Process of development & research include recognizing need or talent, creation of thoughts, creation, designing, production and introduction and publication of a new product or technological system. (Din Velgedhar, 1980).
Unesco (1980) has defined development & research as: any innovative and consistent activity to increase level of knowledge including knowledge related to human, culture and society and use of this knowledge in new applications. Dr. Navaz Sharif defines development and research as: "the greatest single source of innovation is development and research and ability of moving with others and outrunning them whether countries or people depend on innovative skills.

personnel training

Training programs of employees in an organization may remove need to specialized manpower in future and being a guarantee for solving problems of employees. Therefore, if employees of an organization are well trained, they will better participate in efficiency promotion of the organization and supervisors and managers may not need to supervise on their servitors. However, they may make employees ready for higher positions and responsibilities because employee may fulfill their duties suitably by correct training. Now, during service training of employees has a special position in various organizations because sciences and technology have developed during last decades more than any other periods during human history. This evolution and development is so that half of human information is abolished at each five years, and new information and knowledge are replaced. (Anderson, 2008)

Innovation

Ferimann believes that organizational and technological innovations are important factors for promotion of competitive operation in organizations, states and long term economic growth of the world.
There are various definitions for innovation of which the most important ones are as follows:
Halt (1998) used term of innovation in a wide concept as a process for using related knowledge or information to create or introduce new and useful things. Varking describes: innovation is any reviewed

thing that is designed and realized and reinforce position of organization against its competitors and also realize a long term competitive superiority. In other words, innovation is creation of a new thing that follows a definite goal and fulfill. Therefore, in an overall definition, innovation may be defined as any new idea about an organization, industry or nation in the world. (Khodadad Hosseini, 1999). In view of Defet, innovation is to use an idea or behavior which is new for the organization using it.

Change

Change which is different single trilateral has a meaning close to words of difference, evolution, variety, in other words, change or variation includes any secondary situation to primary situation of a thing or person. (Baker, 2002)
Change is a magic word which is a hole of hope for some persons namely improvement of events, conditions and status of people is provided by change (Hensen, 1991)
Amount of change may be more or less and may affect on various elements of organization or some limited elements based on its wide. Change may be fulfilled rapidly or slowly. New situation caused by change may have more different nature than previous status or new situation may have the same primary nature along with new form and specifications. Each method is important because it demands different actions of leaders and executers of organizational evolution (French Will 2000)
2-9- Hypotheses of research

1. internal development and research is effective in capacity of technology absorptive
2. foreign development and research is effective in capacity of technology absorptive
3. personnel training is effective in capacity of technology absorptive
4. innovative cooperation is effective in capacity of technology absorptive
5. view of change is effective in capacity of technology absorptive

purpose of the research

Main purpose: **Identification factors affecting Technology Absorption Capacity**
Secondary purposes:
To determine effect of internal development and research on capacity of technology absorptive
To determine effect of foreign development and research on capacity of technology absorptive
To determine effect of innovative cooperation on capacity of technology absorptive
To determine effect of view of change on capacity of technology absorptive
To determine and describe capacity of technology absorptive
To determine and describe the factors effective on capacity of technology absorptive

Research Methodology

statistical population and research sample

Statistical society includes all technical managers of Sarcheshmeh copper complex who are 151 persons.

Research Methodology

As results of the research have been used for Identification factors effective in capacity of technology absorptive, therefore, purpose of the research is applied one and due to being in organization and collecting information inside the organization by questionnaire, it is field- scaling type. Also, according to

way of collecting information, research plan of this study is descriptive one. As purpose of the research is to study and find relation between variables of the research, then, its nature is correlative one.

tools of data collection

In this study, questionnaire has been used in addition of librarian sources such as book, English and Persian articles, magazines, thesis, research plans for information analysis which is made by researcher and corrected by view of professors and has 5 dimensions and 28 questions.

Justifiability and stability

To study justifiability of questionnaire, justifiability of contents is used. For determining validity of content, the questionnaire was distributed among 5 professors.
In this research, Chronbakh Alpha was calculated by SPSS software. After collecting primary samples (15 questionnaires), stability was calculated by Chronbakh Alpha for total questionnaire and its dimensions. Chronbakh Alpha of total questionnaire is 0.956 which shows that questionnaire has high stability. Other dimensions of the questionnaire have suitable stability (Chronbakh Alpha is more than 0.7)

The Analysis of Data

Test of research hypotheses by modeling structural equations
Conceptual model of the research is analyzed here. For this purpose, AMOS 22 software was used for modeling structural equations. At present research, two-phase approach was used for modeling structural equations so that measurement models are composed at the first phase in a manner that relations between indicators and structures or hidden specifications are considered by confirmatory factor analysis in order to know how precise the indicators of each structure measure the structure and in second phase, effect of structures on each other are studied by structural equations model.
4-1- indicators of model validation

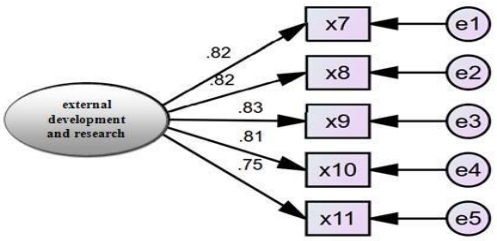


Diagram 2- measurement model of external development and research

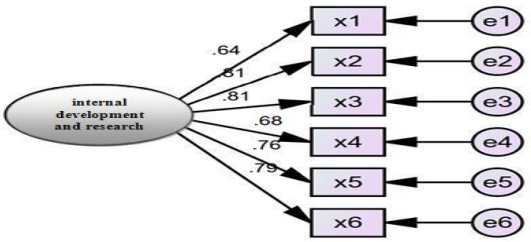


Diagram 1- measurement model of internal development and research

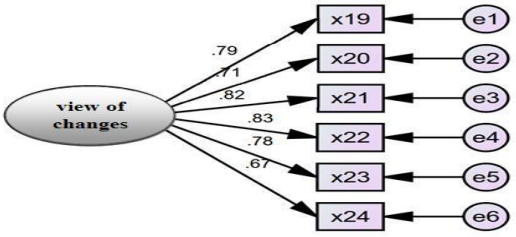


Diagram 4- measurement model of view of changes

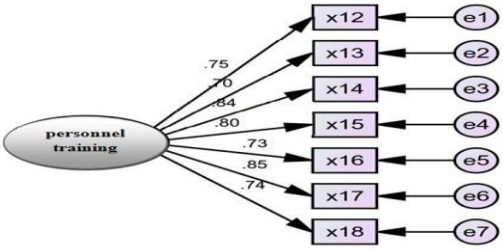


Diagram 3- measurement model of personnel training

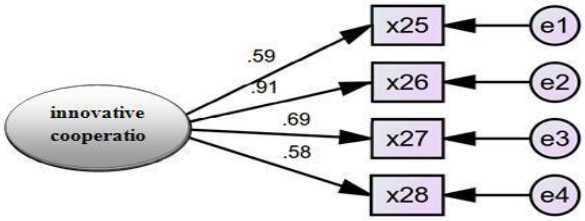


Diagram 5 - measurement model of innovative cooperation

Table 2- indicators of measurement models validation

Indicator	Quorum	internal development and research	foreign development and research	personnel training	view of change	innovative cooperation
(X^2/df)	≤ 3	1/053	2/525	2/131	2/149	0/589
CFI	≥ 0/90	0/923	0/959	0/974	0/920	0/926
TLI	≥ 0/90	0/921	0/878	0/947	0/913	0/930
IFI	≥ 0/90	0/925	0/960	0/974	0/922	0/929
RFI	≥ 0/90	0/984	0/948	0/905	0/980	0/997
NFI	≥ 0/90	0/908	0/949	0/953	0/906	0/919
PCFI	≥ 0/5	0/596	0/520	0/587	0/594	0/585
PNFI	≥ 0/5	0/589	0/56	0/576	0/588	0/584
PRATIO	≥ 0/5	0/529	0/533	0/5	0/529	0/5
RMSEA	≤ 0/08	0/06	0/054	0/077	0/073	0/01

Results of table 2 show that indicators of measurement models validation are suitable. In following, factor loads and significance level of each measurement model are studied.

Table 3- factor loads of measurement model significance level of each (internal development and research model)

Relation			factor loads of Standard Estimation	CR Crisis Ratio	Significant level
x1	←	internal development and research	0/645	-	-
x2	←	internal development and research	0/812	8/133	0/000
x3	←	internal development and research	0/814	8/174	0/000

Relation			factor loads of Standard Estimation	CR Crisis Ratio	Significant level
x4	←	internal development and research	0/682	7/098	0/000
x5	←	internal development and research	0/76	7/766	0/000
x6	←	internal development and research	0/786	7/97	0/000

Table 4- factor loads of measurement model significance level of each (external development and research model)

Relation			factor loads of Standard Estimation	CR Crisis Ratio	Significant level
x7	←	external development and research	0/817	-	-
x8	←	external development and research	0/816	11/19	0/000
x9	←	external development and research	0/83	11/42	0/000
x10	←	external development and research	0/808	10/911	0/000
x11	←	external development and research	0/754	10/041	0/000

Table 5- factor loads of measurement model significance level of each (personnel training model)

Relation			factor loads of Standard Estimation	**CR Crisis Ratio**	**Significant level**
x12	←	personnel training	0/753	-	-
x13	←	personnel training	0/702	8/603	0/000
x14	←	personnel training	0/839	10/514	0/000
x15	←	personnel training	0/797	9/927	0/000
x16	←	personnel training	0/729	8/987	0/000
x17	←	personnel training	0/848	10/624	0/000
x18	←	personnel training	0/74	9/109	0/000

Table 6- factor loads of measurement model significance level of each (view of changes model)

Relation			factor loads of Standard Estimation	**CR Crisis Ratio**	**Significant level**
x19	←	view of changes	0/793	-	-
x20	←	view of changes	0/713	9/079	0/000
x21	←	view of changes	0/817	10/804	0/000
x22	←	view of changes	0/834	11/081	0/000
x23	←	view of changes	0/784	10/236	0/000
x24	←	view of changes	0/669	8/401	0/000

Table 7- factor loads of measurement model significance level of each (innovative cooperation model)

Relation			factor loads of Standard Estimation	**CR Crisis Ratio**	**Significant level**
x25	←	innovative cooperation	0/589	-	-
x26	←	innovative cooperation	0/907	6/701	0/000

Relation			factor loads of Standard Estimation	CR Crisis Ratio	Significant level
x27	←	innovative cooperation	0/687	6/398	0/000
x28	←	innovative cooperation	0/582	5/693	0/000

As seen in above tables, factor loads have significant level less than 0.05 at each measurement model and all are significant (crisis ratio more than 2.57). This shoes that indexes are significant and determine conceptual variables well and structures of the questionnaire have factor justifiability.

evaluation and test of structural model of the research (Hypotheses test)

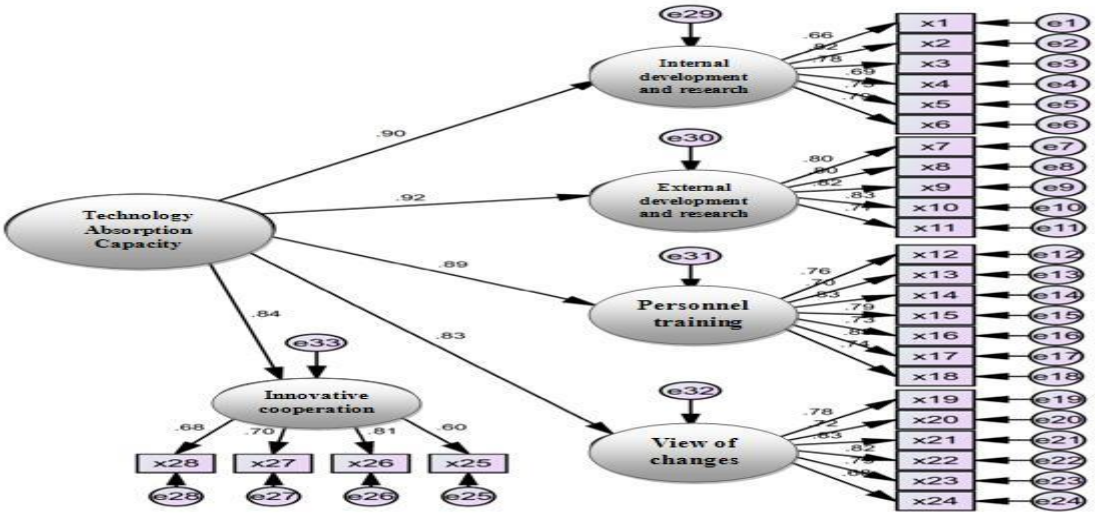


Diagram 6- structural model of the research (standard estimation)

Fitting indexes have been calculated to determine appropriateness of structural model of the research and table 8 was gained.

Table 8- Fitting indexes of structural model of the research

Index	Suitable limit	Second order factor model
(X^2/df)	≤ 3	2/299
CFI	≥ 0/90	0/949
TLI	≥ 0/90	0/923
IFI	≥ 0/90	0/952
RFI	≥ 0/90	0/924
NFI	≥ 0/90	0/956
PCFI	≥ 0/5	0/722
PNFI	≥ 0/5	0/650
PRATIO	≥ 0/5	0/850

RMSEA	≤ 0/08	0/043

Results of above indexes show that structural model of the research has a suitable fitting. Therefore, effectiveness of variables may be studied by gained regression ratios and their significance. In table 9, regression ratios and significance of structural model of the research are shown.

Table 9- regression ratios and their significance (structural model of the research)

Result of hypothesis	Significance	CR Crisis Ratio	Standard ratio	Relation			hypothesis
Effectiveness is 99% significant. Relation between variables is positive.	0/000	8/25	0/904	Internal development & Research	←	Capacity of technology absorptive	First hypothesis
Effectiveness is 99% significant. Relation between variables is positive.	0/000	10/51	0/925	Foreign development & Research	←	Capacity of technology absorptive	Second hypothesis
Effectiveness is 99% significant. Relation between variables is positive.	0/000	9/5	0/885	Personnel Training	←	Capacity of technology absorptive	Third hypothesis
Effectiveness is 99% significant. Relation between variables is positive.	0/000	9/14	0/829	View of change	←	Capacity of technology absorptive	Fourth hypothesis
Effectiveness is 99% significant. Relation between variables is positive.	0/000	6/8	0/838	Innovative cooperation	←	Capacity of technology absorptive	Fifth hypothesis

Conclusion:

To follow the first purpose of effect of internal development and research in the mentioned statistical population, the results showed that average of internal development and research is 3.3 with standard deviation of 0.9 which shows that status of internal development and research is medium to high.

To follow the second purpose of effect of foreign development and research in the mentioned statistical population, the results showed that average of foreign development and research is 3.1 with standard deviation of 1.01 which shows that status of foreign development and research is medium to high.

To follow the third purpose of effect of personnel training in the mentioned statistical population, the results showed that average of personnel training is 3.07 with standard deviation of 1.02 which shows that status of personnel training is medium to high.

To follow the fourth purpose of effect of view of change in the mentioned statistical population, the results showed that average of view of change is 3.3 with standard deviation of 0.9 which shows that status of view of change is medium to high.

To follow the fifth purpose of effect of innovative cooperation in the mentioned statistical population, the results showed that average of innovative cooperation is 3.06 with standard deviation of 1 which shows that status of innovative cooperation is medium to high.

To follow the sixth purpose of effect of technology absorptive capacity in the mentioned statistical population, the results showed that average of technology absorptive capacity is 3.1 with standard deviation of 1 which shows that status of technology absorptive capacity is medium to high.
To follow the seventh purpose, some fivefold hypothesis were stated which is the first hypothesis (internal development and research) and by using structural equations, the results showed that there is significant and positive relation between technology absorptive capacity and foreign development and research.
The third hypothesis (personnel training) by using structural equations, the results showed that there is significant and positive relation between technology absorptive capacity and personnel training.
The fourth hypothesis (view of change) by using structural equations, the results showed that there is significant and positive relation between technology absorptive capacity and view of change.
The fourth hypothesis (innovative cooperation) by using structural equations, the results showed that there is significant and positive relation between technology absorptive capacity and innovative cooperation.

discussion & study:

Organizations follow many goals but the important goals that are common goals of organizations are profitability and survival. Realization of profitability and survival are becoming more difficult for organizations day by day because we live in an environment in which change and dynamism are its main and inevitable specifications. Organizations have to change itself proportion to environmental change to realize their goals and if they may not gain this goal, they will drop behind their competitors and go out of competition. one of available important environmental changes is technological change so that modern technologies come to the market place at different areas and used in different industries. In these conditions, the competitors who are working in our working field are trying to use more modern technologies in order to render their services and products with lower cost and higher quality. In these conditions, work becomes more difficult for developing countries and their industries because considering to globalization flow, if they may not make considerable and suitable technological changes, they will go out of competition area and seclude and their goals will face with serious challenges. to gain technological self-dependent, technology should be transferred, assimilated and fitted and changed at the most suitable cases. As technological suitability is the means of assimilating technological relation with national policies of development, the policies that are designed for mobilizing capacities for suitability and absorptive, need to be considered to mobilize national capacities of research. Technologies have natural specifications that may be not changed by suitability processes that are defined in a limited way. Some of these specifications such as technological complexity, financial needs, evolution and change, skill, manpower, and content of understanding, have the most facilities to promote and absorptive technology.
In this research, the factors affecting on absorptive capacity are internal development and research, foreign development and research, personnel training, innovative cooperation, and view of change and the results showed that there are direct and significant relation between these factors and absorptive capacity of technology.
It is shown that there is positive and significant relation between absorptive capacity of technology and internal development and research. It means that more internal development and research in organization, more technology will be assimilated and localized which is in direction of Basak Delgis (2013) and Sazali et al. (2009) researches. Technology absorptive is a difficult and costly activity that demands for investment in internal capabilities . According to research it became clear that the organization needs to cooperation of individuals to absorptive technology, therefore, more investment should be performed for improvement of employees' operation to increase absorptive capacity. Without minimum investment in

this field, technological gap is so much that possibility of falling behind technology holders will be more than approaching to them.

In this research, it is shown that there is positive and significant relation between foreign development and research and infrastructural variable of technology absorptive capacity. By absorptive capacity, industry may acquire foreign knowledge and has opportunity to do different works which is in direction of Basak Delgis (2013), Sazali et al. (2009) and Jeff Segier (2012) researches.. Foreign development and research cause decrease of dependence to developed countries and finally, development of internal technological capabilities may be directed to competitive benefits. At past, researches were considered as means of new technology creation but now, it has been cleared that researches increase ability of companies, industries and right of countries in absorptive and use of available knowledge. In other words, the organizations that do survey themselves will better use foreign available knowledge which is side product of research investment. This is why investment in research increases absorptive capacity.

It has been shown that there is positive and significant relation between infrastructural variable of technology absorptive capacity and personnel training, therefore, personnel training have much affect on increase of technology absorptive capacity which is in direction of Sazali et al. (2009) and Ayan Youan Loo et al. (2008) researches., an important approach that has been in program of directors of Sarcheshmeh copper complex was to admit several graduates of universities and hold training courses and finally to send them to countries exporting technologies for a short time aiming to help to know technology better and direct investment to increase absorptive capacity in this industry. Process of technology transfer is a learning process that has some benefits therefore, directors should develop previous knowledge of the company and learning processes and absorptive capacity of the organization until benefits of technology transfer increase. Ability of employees depends on professional skills and training degree and as a result, high ability and motivation of employees result in transfer of knowledge and skills.

Also it has been shown that there is positive and significant relation between infrastructural variable of technology absorptive capacity and view of change namely, having a suitable strategy of view of change cause increase of technology absorptive capacity in organization which is in direction of Moroch and Pourdan (2009) researches. Specifications of better technology are flexibility and high speed of its changes. more considered to positive interaction between major directors and executive managers for accepting change and reaction of customers to improve technology because modern technologies necessary for customers should be recognized and its suitable strategy applied by major directors and executive managers.

In this research, it is shown that there is positive and significant relation between infrastructural variable of technology absorptive capacity and innovative cooperation and this shows that if there is innovative cooperation, it causes increase of technology absorptive capacity which is in direction of Fakhr Razi (2013), Salehi (2013), Jeff Segier (2012) and Moroch and Pourdan (2009) researches. Problem of most internal samples of technology transfer is that finishes to simulation of foreign products and processes while many specifications of the considered product are not suitable for the state and new specifications should be added to it by innovation.

Proposals

According to results of the research, the factors affecting on absorptive capacity are internal development and research, foreign development and research, personnel training, innovative cooperation, and view of change and the results showed that there is positive and significant relation between these factors and absorptive capacity of technology. The following cases are proposed for increasing absorptive capacity of technology:

1- more researches in the field of technology development
2- some researches aiming to market and production engineering application to absorptive technology

3- to hold related training workshops
4- to support major directors for new ideas and encouragement of innovative employees
5- positive interaction between major directors and executive managers for industrial change
6- attention to customers in the field of improvement of technology
7- to make culture of team working
8- to establish teams for solving innovative problems

References:

Arabshahi Karizi, Ahmad, comprehensive view of technology transfer process: methods, steps, obstacles and factors in success of technology transfer, a set of articles of congress for innovation and technology management, Garmsar Payame Noor University, Dec. 2009.

Andre Spithoven, BartClarysse, MirjamKnockaert; Building absorptive capacity to organize inbound open innovation in traditional industries; Technovation30(2008)130–141

A.W. Sazali, C.R. Raduan, U. Jegak and A. Haslinda, 2009, The Effects of Absorptive Capacity and Recipient Collaborativeness as Technology Recipient Characteristics on Degree of Inter-Firm Technology Transfer, Graduate School of Management, University Putra Malaysia, 43400 Selangor, Malaysia, Journal of Social Sciences 5 (4): 423-430, 2009, ISSN 1549-3652

Baker, W.D. and Sinkula, J.M. (2002), "Market orientation and the new product paradox", Journal of Product Innovation Management, Vol. 22, pp. 483-502

Basak Dalgic , 2013,Absorptive Capacity and technology spillovers: A case from Turkey , Hacettepe University, Department of Public Finance, Beytepe Campus 06800 Cankaya/Ankara , Journal of Business, Economics & Finance (2013), Vol.2 (2)

Balabadi, Azam, interaction of technology management and development and research, Aja University of medical sciences, 2012.

Banavand, Mahsa, comprehensive theory of technology transfer, Islamic Azad University, Qazvin branch, autumn 2007.

Cassiman, B. and veugelers, R., 2000, "external technology spurces: mbodied or disembodied technologhy acquisition", Working Paper UPF, 444,pp.1-22.

Cohen, W.M. and Levinthal, D.A, 1990. "Absorptive capacity: a new perspective on learning and innovation" , Administrative Science Quarterly, 35(1), pp.128-152

Dean, B. V., Goldhar, J. L., (Eds), Management of Research and Innovation, New York, 1980

Feghhi Farahmand, Naser, 2004, technology management of organization, publication of Islamic Azad University, Tabriz branch, 1st edit.

Feghhi Farahmand, Naser, Dabaghi Sadr, Mohammad, 2013, role of technology in industrial infrastructures (case study of leather industry), the first national congress of standardization and applied research in leather and looming industry.

Fakhrorazi Ahmad1, Osman Mohamad2 and Hazril Izwar Ibrahim , 2013, Absorptive Capacity and Innovative Behavior among Engineers in Malaysia, Available online at www.elixirpublishers.com (Elixir International Journal), Management Arts, Elixir Mgmt. Arts 56 (2013) 13496-13504

Freeman. Christopher . the Economic of Industrial innovation .c. nicollos & company Ltd Manchester u.k.1974

Hosseini Golkar, Mostafa, 2013, investigating about concept of absorptive capacity in the fields of knowledge and technology, sciences & technologies book, 3rd course, 7th year, 10th vol.

Henson, Mark, 1991, organizational behavior and education management, translated by Mohammadali Naeli, Ahvaz, Shahid Chamran University.

Hu, A. et al, "R&D and Technology Transfer: firm Level Evidence from Chinese Industry", Review of Economics and statistics, February 2003

Iuan-Yuan Lu1, Ting-Syuan Lin2, 2008, The role of absorptive capacity in hi-tech organizations while transferring technology

Jafarnejad, Ahmad, management of modern technology, Tehran University publication, second edition, 2009.

J.M. Heigins, "entrepreneurship: 101 techniques of innovative problem solving", translated by Mahmoud Ahmadpour Daryani, 2001.

Khodadad Hosseini, Seyed Hamid, Article: innovation in organizations: concept, types and processes, research, scientific magazine of management and economics, vol. 42, autumn, 1999.

Mahnak, Kavous. Technology transfer: an approach for technical and scientific self-dependence of Middle East countries, translated by Abdolhossien Azarang, Tehran, Hermes, 2003.

Moradi, Mahmoud, Valipour, Mohammadali et al, 2013, study of role of knowledge absorptive capacity in innovative operation of organizations (case study: pharmacy companies and insurance companies in Tehran stock exchange), perspective of commercial management, vol. 13, Naghizadeh, Mohammad, Tabatabaeian, Seyed Habibollah, Manteghi Manouchehr et al, 2012, pattern of increasing absorptive capacity emphasizing on applied orientation of organization and conception of managers from environment dynamics, sample of corporations in air electronics, scientific research periodical of technology and science policy, 4th year.

Murovec, N. and Prodan, I., 2009, "Absorptive capacity, its determinants , and influence on innovation output ; Cross-cultural validation of the structural model" Technovation , 29(12), pp. 859-872

Nika Murovec, Igor Prodan, 2008, The Influence of Organizational Absorptive Capacity on Product and Process Innovation, Organizacija,Volume 41, Number 2, 1Institute for Economic Research, Kardeljeva pl. 17, 1000 Ljubljana, PS Center d.o.o., Ulica bratov U~akar 70, 1000 Ljubljana, and Faculty of Economics, University of Ljubljana, Kardeljeva ploš~ad 17, 1000 Ljubljana

Nader Salehi, Assoc. Prof. Dr. Rozeyta Bt Omar & Assoc. Prof. Dr. Kamariah Bt Ismail, 2013, Exploring the Entrepreneurial Antecedents of Absorptive Capacity and Its Impact on Open, Radical and Incremental Innovation, Faculty of Management and Human Resource Development (FPPSM), Universiti Teknologi Malaysia (UTM), ISSN 2090-4304, Journal of Basic and Applied Scientific Research www.textroad.com

Poursoleimanian, Farideh, 2008, challenges and opportunities for development of research and technological innovations in industries of the state, 7th congress of Mines & Industries Development Center, Tehran, Specialized Association of Mines & Industries Development centers.

Rahmanian, Saeid, Nasr, Mehdi, 2010, to create absorptive capacity for organizing open innovation in SMEs, 4th national conference of technology management, surveying center of development and technology, Esfahan University of technology

Rivlin P. (2001), "Economic Policy and Performance in the Arab World", London: Lynne Renner

Sheling, M., 2008, strategic management of technological innovation, Tehran: office of cultural researches.

Salehi Vaziri, Hossein, Asadifard, Reza, 2003, role of research and development units in absorptive and localization of assimilationed technologies, 4th congress of Mines & Industries Development Center, Tehran, Specialized Association of Mines & Industries Development centers.

Sugheir,j, philip,h. iftekhar, h. " Diversification and innovation revisited ; An absorptive capacity view of technological knowledge creation" boise state university scholar works, depatrment of management 11-1-2012

Tavanbakhsh Hesameddin, 2010, studying role of organizational culture and absorptive capacity in success of information technology performance in hospitals of Tehran, national congress of organizational behavior in nursing, Islamic Azad University, Shirvan branch, commercial management group of Shahid Chamran University.

Tarogh Khalil, 2004, technology management, sign of success in competition and wealth creation, translated by Mohammad Arabi, office of cultural research, 1st edit, Tehran.

Vandel French, Sicil Bel, evolution management in organization, translated by Alvani, Eshraghi publication, Mar. 2012

Zahra, S.A. and Georg, G., 2002, "Absorptive capacity: A review, reconceptualization , and extension", Academy of Management Review, 27(2), pp.185-203