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International Services and Internationalization of Science Parks

Parallel Session 5
"Key elements of next generation STPs and AOIs"

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Introduction

The term "internationalization" commonly refers to "the process of increasing involvement in international operations" (Welch and Luostarinen 1988).
Science and Technology parks normally adopt different policies to create attractions for knowledge-based companies. The effectiveness of these policies depends on the socio-economic infrastructures in the region where the parks operate. This includes the ties and relations of SMEs and the tenant companies settled in the park with their partners inside and/or outside the park and the national and international relations of the park itself. Why do science parks and their firms need internationalization? Very often it is because of small domestic markets, which are not big enough to consume all the smart and high niche products, therefore companies need to establish international links to reach out to the international markets. In addition, bringing in foreign technologies or modules and blending them in to the already existing pool of products is a faster way to upgrade a company's technological sophistication, and reducing the product development time. Therefore, small domestic markets, enhancing growth and development of new technological firms and increasing competitiveness in domestic and international markets are the major reasons for internationalization.

Why Move towards Globalization and the Internationalization of our Start-ups!
Globalization is actually the process in which the World economy is rapidly transforming as a single interdependent industrial system. Triggered by various advances in the different fields of the economy such as business, transportation technology, and communications, globalization provides a fast combination of industry culture throughout the world as well as the development of innovative marketplaces to operate trade between physically distant people.
Most economists agree that globalization provides a net benefit to individual economies around the world, by making markets more efficient, increasing competition, limiting military conflicts, and creating a more equal distribution of wealth worldwide. With such a consensus among economists it should therefore be embraced on the whole by governments and individuals. Some of the benefits of globalization include:

1. **Attracting Foreign Direct Investment (FDI)**
   FDI tends to increase at a much greater rate than that of the growth in world trade, helping boost technology transfers, industrial restructuring, and the growth of global companies.
2. **Influencing Technological Innovation**
   Increased competition from globalization helps stimulate new technology development, particularly with the growth in FDI, which helps improve economic output by making processes more efficient.

- **Creating Economies of Scale**
  Globalization enables companies to realize economies of scale that reduce costs and prices, which in turn supports further economic growth.
  Today the integration of the global economy has mainly been due to the rapid spread of IT and communications that enabled countries like India and China to circumvent hitherto aspects that were holding them back. In other words, the increasing interconnectedness was driven by real time communication between the West and the East which enabled these countries to reach out to wider markets and audiences in the Western countries.
  The classic example in this regard is India that has managed to tap into the booming market for IT and process outsourcing. China has done so as well, but it has leveraged the spread of IT and communications technologies in a different manner. The fact that China became a manufacturing powerhouse is largely due to the fact that though the country is still lagging behind in English speaking populace, it has been able to leverage the shift in jobs from the West to the East. The point here is that with IT, Communications and English spreading rapidly,

India was able to leapfrog the Industrialization phase of Globalization whereas China drew strength from its youthful population as well as the tendency for business leaders in the West to look for ways and means of cutting costs.
With such benefits and influence yielding from Globalization, Iran's ministry of Science Research and Technology, and also its Science and Technology ecosystem and especially that of Isfahan Science and Technology Town have felt it most important to follow in the footsteps of other successful developing countries pursuing globalization like India and China and has thus prioritized the internationalization of companies at Science and Technology Parks and Incubators.

Internationalization of Science and Technology Parks

Internationalization is an essential business tool in many countries. It is through networking and internationalization of companies, that STPs and organizations can assure their clients of having a stable platform for performing business activities and competing in global market. It is through international activities and joint ventures and networking that you can be certain of the growth of your business and the economy since networks usually harness the talents, expertise and commitment of many companies and organizations that are active in international business around the world.

Although science parks are at the most important positions in the international markets and need to act on the global market place, some of the science parks and incubators prefer to operate without any relations with other similar organizations. They may be successful themselves in some degree but for their tenants it is not so. Since the tenants need to have access to the global markets. They need to communicate with others at both national and international levels. Meanwhile, since the success and/or failure of STPs are measured based on the success or failure of their tenant companies, this individuality and no relation operation seems not to work well. Therefore, in science parks and incubators, internationalization is an important factor that leads to cooperation between parks and tenant companies and marketing for them. STPs and their companies perform a wide range of activities from providing contacts for companies wanting to develop their business overseas, to helping their industries develop their international strategies, to providing internships for staff and executives. The main aim of the network of STPs is to increase the value and success rate of incubation centers by sharing the best practices, management skills and resources and when the value and success of incubator or park increases it means that the same has happened for the companies settled there. In this way the companies become actually part of an extensive network of other companies, universities, research centers and other organizations related to them. This leads to developing a strong culture of collaboration where ideas, experiences and services are exchanged every day, which is the main objective of science parks and incubators. This networking which is itself a kind of an internationalization process could be done in different ways.
STPs usually strengthen their international relations through membership in international associations such as IASP, ASPA, WTA and other major science parks associations where there are hundreds of members to cooperate with.
A number of STPs prefer to sign MOUs with their foreign counterparts as a means of establishing a platform for cooperation for a specific period of time.

Participation in international exhibitions and other similar STP events and organizing technology tours to other STPs are some of the other methods that STPs adopt to internationalize themselves which also results in the internationalization of their companies.

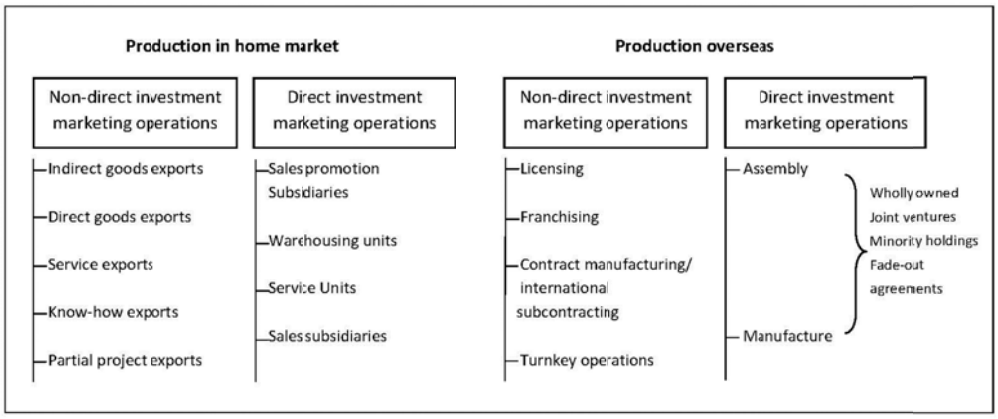
Internationalization of SMEs

Growth of the internationalization process of companies is a major milestone in today's world. Both small and large firms have increasingly initiated international operations to exploit technological and organizational advantages and to reduce their business costs and risks. Sometimes used interchangeably with globalization, internationalization is attained through a variety of international market entry and development modes. These include: exporting, licensing, franchising, management contracts, turnkey contract, industrial cooperation agreements, contractual joint ventures, etc. A number of researchers have tried to classify internationalization modes. One of them is the Luostarinen's (1980) approach, whose distinction between home and overseas production, and direct and non-direct investments (see figure 1) offer useful insights into understanding SME versus large firm internationalization. In general terms, the progression from home-based internationalization modes to overseas production modes is marked by an increase in resource commitments/transfers and risks.

Small and medium enterprises (SMEs) are strategically important to international business. The process of internationalization of SMEs located in a science park could be fostered not only by direct expansion of small enterprises, but by influence of the park as well.

Internationalization happens in different ways. It is sometimes through exporting, or through cooperation and initiating joint research projects, partnership contracts, etc. Traditionally, internationalization e.g. exporting has been seen as a way to increase turnover of individual enterprises. Exporting, as the traditional way to internationalize, is still very important, but during the last decade, internationalization has become a much more differentiated business activity of crucial importance to achieve some changes in knowledge and technology and to strengthen international business strategies of SMEs. Exporting and supply is usually the first step on the internationalization path, which occurs casually in most cases - and only after the firm has become established in the domestic market and grows in size and experience.
Internationalization of SMEs is considered today as a means of strengthening the competitiveness of companies.

Figure 1.1 Forms of international market entry and development



Source: Luostarinen (1980)

The Importance of Internationalization of Science and Technology in Iran's Developmental Road Map

Great emphasis is placed on the subject of Science, Technology and Innovation in all of Iran's Macro Economic guidelines and master plans including Iran's 20-year Vision Plan, Iran's Comprehensive Scientific Map, Iran's Sixth Five Year Developmental Plan and all of the General Science and Technology policies pursued by the Islamic Republic of Iran. Science, Technology and Innovation are considered as influential and important subjects for the country, ergo its development is of great concern and priority. In addition, the concept of Internationalization of Universities, Research Centers and Science and Technology Parks by engaging other countries, transferring technologies and increasing the export of products and services of knowledge-based companies is also considered important and vital to the nation's development. Some of the most important clauses of these macro-economic guidelines in regards to Science, Technology and Innovation will be examined in procession.

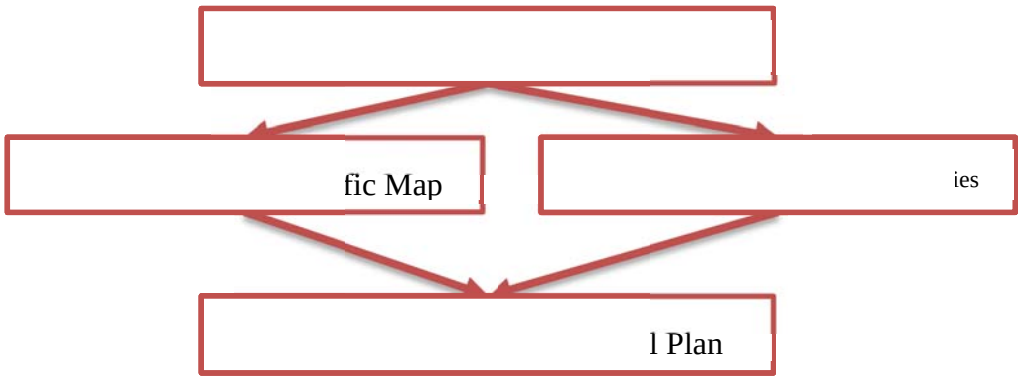


Figure 1-2: Iran's most Important Developmental Plans for Science and Technology

Iran's 20-year Vision Plan:

In 2005, Iran outlined its goals in economic, science and technology for the next twenty years, Sanad-e-Cheshm Andaz-e Bist Saleh (The Twenty-Year Vision Document), a working plan to raise the country's ranking to that of the first in the region. This article aims to map Iran's scientific and technological performance over five years since the ratification of the plan. Three main areas of science and technology—the percentage of GDP invested in knowledge, scientific performance and technological performance—were used to compare Iran's scientific output with a set of regional countries. The study revealed that Iran's investment in science to

inspire technology (the linear model) has been able to nourish scientific performance in the form of rising publication, whereas the neighboring countries followed a more diversified pathway and inspired science from technological advances. Thus, the number of countries in the region capable of competing with and even outstripping Iran in terms of technological and hence scientific performance has increased.

General Policies Relating to Science and Technology:

The General Policies of Iran in relation to Science and Technology is a Legal Act that has been approved and announced by Iran's highest official order and works as a guideline for operationalizing science and technology related programs. The 6th section of the Act for macroeconomic policies in relation to Science and Technology focuses on internationalization of Science and Technology:

"The development of constructive scientific and technological collaborations and active relations with other countries and regional and international Science and Technology Centers, whilst maintaining the country's independence is to be attained with emphasis upon:

- The development of services and industries based upon new science and technologies, supporting the manufacturing and export of knowledge-based products rooted in indigenous technologies from sectors of the economy with preponderance and balancing the trade deficit.
- The transfer of technology and technical knowledge and knowhow for the design and manufacturing of products domestically with special attention to the capacity of internal markets for consumption of imported merchandise.
- Use of the scientific and technological potential and capacity of Iranian experts residing outside of Iran and attracting foreign researchers and specialists from the international community especially from Islamic countries."

Comprehensive Scientific Map

This map is the most complete act of the Islamic Republic of Iran in the field of Science and Technology that showcases Iran's vision for 2025. In its fourth chapter 13 macroeconomic instruments are introduced in which the 9th instrument discusses "active and influential cooperation with other countries especially those of the Islamic World in fields related to Science and Technology". Under the title of this Macro-economic Plan two national plans have been defined which are:

- The Development and Strengthening of National and International Networks of Scientists and Researchers and also International Cooperation with a priority given to Islamic and Farsi Speaking Countries.
- Preparation for attaining first place in Science and Technology in the region and Islamic World.

To achieve these objectives several national initiatives have been organized that consist of:

- The Creation and development of Scientific and Technological Representation Offices at the Embassies of the Islamic Republic of Iran in prioritized region to facilitate the transfer of worldwide experiences and achievements in advanced technologies and the export of Iranian accomplishments in Science and Technology abroad.
- The development of International cooperation with priority given to Islamic Countries and with focus upon comparative advantages and resources.
- The establishment of research networks both domestically and internationally to distribute and transfer knowledge and Technical knowhow in proportion to national priorities in benefiting from international opportunities.
- The establishment of International Research Centers to facilitate and develop international cooperation with priority given to Islamic Countries.
- The hosting of regional and international seminars and conferences and the translation and distribution of Iranian-Islamic works to different languages of the region and world.
- The organization and systemization of international cooperation and relations in science and technology for institutes, communities, scientists and specialists and increasing the number of joint scientific sessions amongst them.
- Offer support to international technology R&D projects by providing joint investment and facilitation of reach to foreign technological institutes and create an increase the technological cooperation with countries that possess advanced technologies by participation in consortiums.
- Creation of a platform for cooperation of Iranian scientists in international communities and advanced centers for science and taking benefit from internationally renowned experts in Iran for opinion sharing and introduction of new scientific phenomena with priority given to Islamic countries.
- Amend the laws and regulations in place for the transfer of technology to the country and expand and develop institutions responsible for the transferring and localization of technology from abroad and vice versa.
- Active participation in the standardization and regulation of criterions in the validation processes and Ranking of Higher Education Centers in the region and Islamic World.
- Attract the effective participation of Iranian and Non-Iranian specialists and researchers.

- Support the provision of Scientific Articles to international publications and platforms and in the international registration of inventions and innovations.

The Sixth Five Year Developmental Plan

Iran's 20-year Vision Plan which showcases the nation's situation in 2025 is a twenty year vision plan that consists of four different 5year programs. Iran's Fourth and Fifth developmental plans that focused on the quantitative and qualitative addition of Science and Research Institutes and Science and Technology Parks drew to an end in 2016. The sixth developmental plan has been approved and announced for the period of 2017-2021. In this developmental plan Science and Technology has also been considered a vital part and the internationalization of Science and Technology recognized and discussed. Some of the clauses that pertain to this matter are as follows:

- Governmental organizations should procure the necessary measures for increasing knowledge-based productivity and the technological level of Iranian companies in order to facilitate the participation of knowledge-based and technological companies and also economic agents in the international production supply chain.

- The government is bound to support the establishment of knowledge-based companies inside of Iran with the participation of competent foreign companies with technology insights for the design, engineering, manufacturing and implementation and transferring of technology in the oil and gas industries and conversion of power plants. These measures are intended to increase the economy's inbreeding by implementing the law for encouraging and support of foreign investment and knowledge-based companies. Foreign companies investing in the transfer of technologies with an Iranian partner need to register a knowledge-based company within Iran used to have at least a minimum equity share of 51% to the Iranian counterpart, while recently this has been modified and foreign companies can register their companies in Iran with 100% of their equity share to themselves. This act hopes to stimulate technology inbreeding within time and create new technologies indigenous to Iran.

As mentioned before the subject of internationalization of Science and Technology on a Macro-economic level is much emphasized and to this end knowledge-based companies and institutes and also Science and Technology Parks and Incubators play a key role. In order to reach these set objectives in internationalization the governmental organizations in relation to science and Technology such as the Ministry of Science Research and Technology and the Vice Presidency of Science and Technology have implemented many programs and initiatives which will follow.

Executive Mechanisms for Internationalization in Iran

Iran's Vice Presidency Office for Science and Technology has established a mediator named "Technology Exchange and Exports Services Corridor" in 2014 to expand the exporting market for knowledge-based companies. This corridor provides services and facilities to k-based companies. The companies are assessed based on an Export Readiness Assessment model (ERA Model) and classified into 4 categories ready to receive services. The items assessed are:

- Assessment of organizational and Structural Readiness
- Assessment of International Business Potential
- Assessment of the Industrial design of Products
- Assessment of Product standard and Technical Knowhow

Services provided by the Corridor

The Export Service Corridor provides its support to the international activities of companies. Some of the activities that could be supported by the corridor include:

- Export consultation services
- Information and promotional activities
- International exhibitions
- Acquiring international certificates
- International market research and export business plan
- Business training and export
- Industrial designing of knowledge-based products
- Hosting business delegations and attending international events
- IP registration, etc

Science and Technology Parks in Iran

There are more than 40 science and technology parks and about 200 technology incubators in Iran.

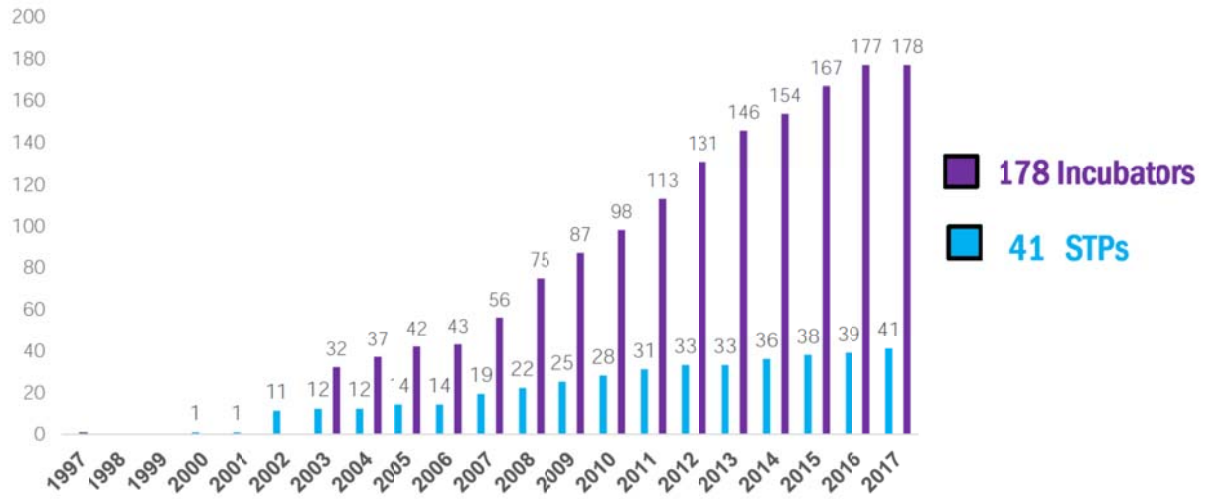


Figure 1-3: STPS and TBIs in Iran

Some 18 STPs are members of the International Association of Science Parks (IASP) and they are considered as the members of the great family of the STP network.

These parks have already hosted big international events in the country including:

- IASP WA Division-ASPA Annual Conference by Isfahan Science & Technology Town (ISTT), 2006
- IASP WA Division-ASPA Annual Conference by Isfahan Science & Technology Town (ISTT), 2011
- ASPA Annual Conference by Fars Science and Technology Park (FSTP), 2014
- ASPA Leaders meeting by Tehran University STP, 2017
- Annual conference of Inter Islamic Network on STPs by Guilan STP
- And some other national and international events

There are currently around 4000 companies settled in Iranian STPs. The following diagram shows the increasing number tenant settlement at Iranian STPs' through the years.

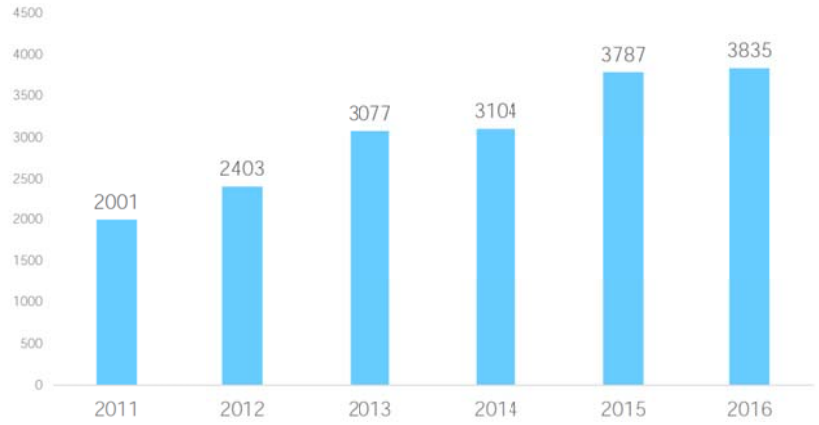


Figure 1-4: The number of companies settled in Iranian STPs

Some 30000 entrepreneurs and young university graduates have been and are still working for these companies. The following diagram indicates the number of people working in Iranian STPs during the past 5 years. (Figure 1-5: number of staff working in Iranian STPs)

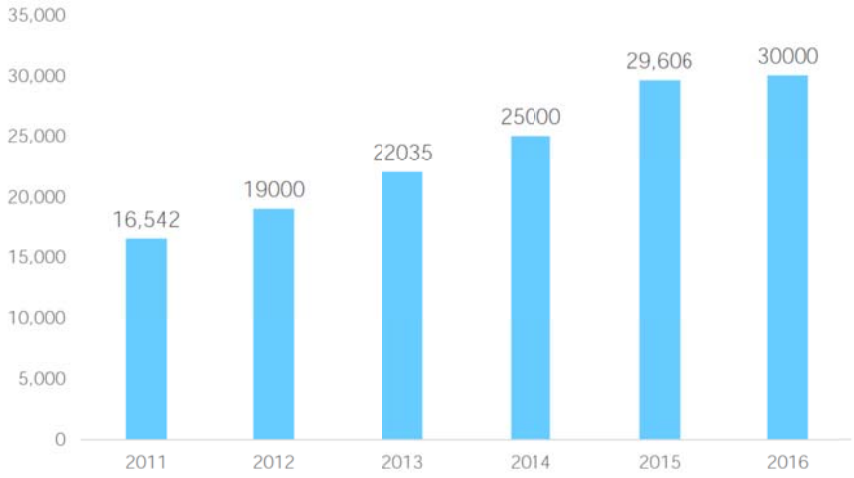


Figure 1-5: The number of staff working in Iranian STPs

Isfahan Science and Technology Town (ISTT)

ISTT is the first and pioneering science and technology town in Iran. It was established in 1995 and currently hosts more than 470 companies active in different technological fields such as ICT, Petrochemical, Nano-Technology, environment, medical equipment, etc.

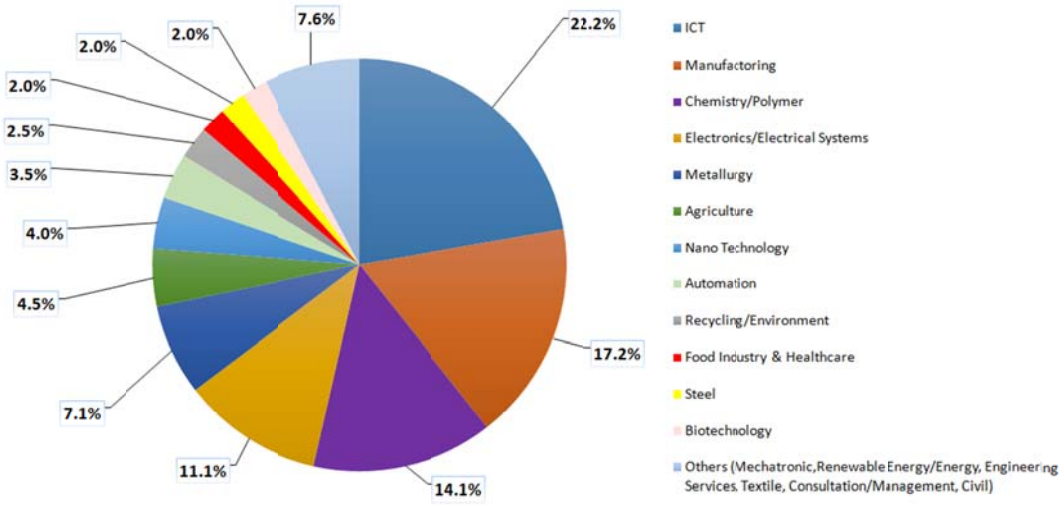


Figure 1-6: The fields of activities at ISTT

There are currently 6500 people working in ISTT companies. They are mostly university graduates and young entrepreneurs. Some of these companies have already developed very good international relations and export their products and technologies, have joint partnership for project execution, have offices in other countries, have MOUs with their counterparts in other countries, etc.
Internationalization of the companies is also of the utmost importance for ISTT, to such an extent that ISTT has defined "Internationalization of K-based companies" as its main objective and motto for the following three years.
ISTT provides international services to companies in the forms of arranging technical tours to other countries, e.g. to Germany and Oman; facilitating their presence at international exhibitions; signing cooperation MOUs; and organizing international events with other international organizations such as joint workshops with COMSTECH, ISTIC, ECOSF, etc.

Conclusion:

It is necessary to widen the assistive programs at S&T parks to reflect a diversified mix of internationalization possibilities to such an extent that SMEs which wish to establish joint-venture operations overseas or engage in strategic alliances or even acquire a production plant abroad would find support and encouragement. Today, companies and SMEs should be supported with appropriate training and consultancy to optimize the benefits

of internationalization. In the internationalization process, the focus should be on different factors depending on their readiness level for internationalization. In some SMEs which are not internationalized, the focus should be on improving the entrepreneurial and international orientation of their key decision-makers through seminars and workshops, export information provision, and sponsorship to trade fairs. In those companies which have entered the international market but lack enough motivation to do so, the focus should be on ensuring that these companies receive positive reinforcement from their international market experience and this could be done through providing necessary information, training, counselling, easing operational problems, etc. For those companies and SMEs that are internationalized it is important to renew their vision and focus making them innovate in their products, processes, organization, market and technology and ensuring their sustainability in international markets.

Therefore, we can classify two types of internationalization in STPs: internationalization of STP and helping the Park's branding; and second is the internationalization of the companies elaborated above.

In Iran there is great emphasis on internationalization of companies and SMEs in the country's Development Plan. To this end, some science and technology organizations offer effective programs. The Ministry of Science, Research and Technology and the Office of Vice-Presidency for Science and Technology are two important examples in this regard. ISTT take advantage of these programs and it also defines its own internationalization programs through helping and strengthening the companies; and through the UNESCO Category II Center (IRIS) that is hosted by ISTT. IRIS is the first UNESCO category II center that focuses on development of science parks and incubators in the world through the services that this center provides to other countries, aiming at information exchange, training, networking, capacity building and technology transfers.

ISTT has continuously followed international programs such as business matching, international training workshops, attending international exhibitions and technology tours and organizing international conferences. Its upcoming international program will be IASP 2018 World Conference that will be held in Isfahan hosted by ISTT. This great event will not only help ISTT's branding but also helps the international networking of companies and the strengthening of their relations and cooperation with their counterparts among IASP members.

References:

Bengtsson, M. and Kocks, S. (1999) 'Cooperation and Competition in relationships between competitors in business networks' *The Journal of Business and Industrial Marketing,* 14(3): 178-193.

Carter, S. and Jones-Evans, D. (2000) *Enterprise and Small Business Principles, Practice and Policy.*1st ed. Essex: Pearson Education Limited.

Chetty, S. and Blankenburg-Holm, D. (2000) 'Internationisation of Small to medium-sized manufacturing firms: a network approach, '*International Business Review,* 9(1): 77-93.

Nummela, N. (2011) *International Growth of Small and Medium Enterprises.*1st ed. Madison Avenue, NY: Routledge Publications.

Thurow, L. (2003) *Fortune Favors the Bold: What We Must Do to Build a New and Lasting Global Prosperity.*NY: Harper Collins.