International Academic Institute for Science and Technology

International Academic Journal of Humanities
Vol. 1, No. 2, 2014, pp. 33-41.

ISSN 2454-2768

International Academic Journal of Humanities

www.iaiest.com

The Role of Staff Commercialization of New Technologies in the Development of Nanotechnology in Iran

Saba Amiri [a], Saman Fathi [b]

[a] *Corresponding Author: M.A. Gradute of Entrepreneurship in Kermanshah, Razi University;Iran.*

[b] *M.Sc. Gradute of Industrial Engineering in Tehran, Iran University of Science and Technology; Iran.*

Abstract

In recent decades, as a key technology for developing new technologies recognized in the international community Fortunately, in our country, delays in understanding the issue and make a decision about it has not happened. Therefore, nanotechnology development staff to create a focus on decision-making and coordination between all relevant institutions active in the field was established. This view is the headquarters for the development of nanotechnology, innovative occupy the country's long-term framework for activities in the form of a strategic document has been prepared. The first period of this document, "Promoting technology" and "development study" were considered. The second period began in the year 1387 and continued for three years, The "infrastructure development" and "Start technology innovation" was the focus. Finally in the third period that started in 1390 and continues, The "commercialization of scientific and technological achievements" and "the formation of nano industry" has been a special concern. The other hand, despite rapid advances many new technologies in the idea and in vitro, Commercialization is faced with many problems. For this reason, and given the importance of accessibility to sustainable competitive advantage in the commercialization process in other countries, This paper explores the implications of nanotechnology commercialization and development of staff actions In order to accelerate and facilitate the commercialization process of innovative ideas and technologies we support owners.

Keywords: Staff Nanotechnology, Commercialization, Nanotechnology, Nanotechnology Initiative Strategic Plan.

Introduction:

Based on Nanoscience and Nanotechnology, not only for industrialized countries and advanced, But more of them in developing countries such as Iran, Should be regarded as a national priority. Now that the topic was opened promote nanotechnology in Iran, planning weighted and measured in this case could lead to the development of the field in the country and the social and economic fruits of your undoubtedly will bring. Our country during two scientific revolution, Which led to the emergence of macro and micro- scale science and technology was, There is no involvement at best consumer and industrial products of others. With the globalization of production, exchange and distribution of goods The importance of countries increasingly determined by their share in the market of new technologies. In this global market, nanotechnology pioneer of innovation and contribution to 1000 billion will have from one to 15 years. Sign our country in the field of science and technology in addition to our country with the third revolution of the global industrial buldings, national real possibility for the overall economy of a single production the product provides knowledge- based economy and transition countries will provide the ranks of advanced countries [1]. Due to widespread application areas of nanotechnology, Most of the existing and creation of media influence and empower the young people of the country, Technology is a priority and strategic for the country. Therefore, planning and activities for the development and commercialization of this technology must be placed on the agenda of macro-level policy-making in the country [2]. In our country, several organizations associated with nanotechnology among them are knowledge-based companies, Incubators and science and technology parks, universities, industries and research centers, institutes, etc., can be mentioned. But the main actor in the development of nano and new technologies in the country, Achievement of the strategic document for the development of nanotechnology, Staff nanotechnology is developed under the auspices of the Presidential Administration and other related departments plays a role. Meanwhile the commercialization process University sector in which ideas and research findings into products, Services and processes marketable turns Through which research findings are brought to market. In other words, the commercialization of research, Collection efforts they mean sales results and findings of academic activities profit and association with the aim of further education and research with economic and social objectives [3]. Commercialization or the process of commercialization of ideas into products requires different information infrastructure, management, law and finance. A subset of Nanotechnology, "Nanotechnology Development Services Lobby" is that taking into account all these requirements to deploy units active in the field of specialized IT services in a focused collection. By creating this network, technology development and proper management of research and technology activities, The desirable achievements in different sectors will be reduced. Services offered at the Lobby nanotechnology development services include:

1) Metrology (measurement scale),
2) Technology transfer to industry,
3) Technical documentation,
4) Consulting and feasibility of projects and industrial projects and services,
5) Legal and intellectual property services,
6) Support for obtaining permits and standards,
7) Investment and financing services,
8) Development and Cooperation guidance technology companies,
9) Marketing services and internal and external trade [4].

"Working Group of industry and market" Nanotechnology is another subsidiary of home headquarters. Which aims at encouraging the industry to incorporate nanotechnology and support them in this direction has been created. The main approach of the Working Group, the industry familiarization with nanotechnology applications and facilitating the transfer of technology from universities and research centers and technology companies, domestic and or sources of foreign technology in industrial applications. The working group will target industries programs include:

1) Industries such as oil and energy, pharmaceuticals, automobile, steel and so on, which are often the government.

2) Private industry in all industrial areas, if the applicant is using nanotechnology [5].

Based on the content of speech and of the importance of new technologies and knowledge-based development in the country and Also note that when new technologies are valuable Which are applied outside and abstract mode, This paper examines the role of Nanotechnology and its actions, In the development process, we commercialization of new technologies. So, first, to introduce the Nano and the history of its formation, The commercialization process is followed. Finally, objectives and plans of the general staff in order to facilitate and accelerate the commercialization process of new technologies to consider.

Theoretical basis of research:

Nanotechnology Introduces the History and Actions

Around 1379, the first sparks of attention of state and government in the world is tied to nanotechnology. Prior to this, only in some research centers and universities, It sporadically, was doing research in nanotechnology . Slowly, with great recognition and importance of this technology, and the role of technical and economic future of the world, major countries to take advantage of opportunities to increase the technology gap with the world, They entered the arena . However, scientific and technical waves usually with an interval of Iran is decades old, but nanotechnology in Iran, the route takes in other technologies. In Feb. 1379, Dr. Ebtekar, adviser to the president, in a letter, raised a new issue of nanotechnology, and to inform them that the matter would be investigated. Letter to the President's Office referred technology cooperation and a team of experts in this office, are responsible for studying the quality and quantity of the subject. The research team as nanotechnology Policy Studies Committee continues its investigation. With the formation of this committee, Persian site Nanotechnologies and published a newsletter begins and promotional activities for different audiences begins The committee's first national conference on nanotechnology will take place on 14 and 15 persian date esfand 1380. This program is a context for understanding and communicating with researchers in nanotechnology and especially a number of Iranians abroad have good research experience in nanotechnology and later academic cooperation with Iranian universities continue [5].

In 1382/06/16 Committee on Nanotechnology Initiative, chaired by Vice President and member ministries of Economic Affairs and Finance, Health and Medical Education, Agriculture, Industries and Mines, Science, Research and Technology, President of Time Management and Planning, Technology cooperation presidential chief of staff and a number of managers and researchers is established.

Staff duties to be determined as follows:

1) Adoption of goals, strategies and policies and national programs in nanotechnology development.
2) The division of duties and determine the overall missions and coordinating their part in a ten-year long-term plan.
3) Supervision on achieving the goals and plans.

Bachelor's efforts to develop long-term development of nanotechnology in August 1384 document concludes. And the Cabinet at a meeting on 1384/05/02 this document is approved and issued it will 1384/05/10. According to the strategy document next ten years, Iran needs up to 1394, Ranked fifteenth in the world in nanotechnology to achieve, and the development of nanotechnology development should be in a way that would promote wealth creation and quality of life [5]. Now in our country is the main institution responsible for development of nanotechnology, Nanotechnology's headquarters .The main task of this committee, to determine the direction and priorities of the country ,Removing barriers to the implementation at runtime and serve for the development of nanotechnology .Upon review, the Committee suggests that Iran, The only country in the region and the only Muslim country that seriously wants to be leading in the field of Nano .Therefore, our country in the coming years will be a coherent and purposeful planning,

A leading role as a center of nanotechnology products export development And in fact lead this movement, among other countries in the region to develop .It is predicted that nanotechnology growth in 2015 and 2030, More broad market commercialization of products based on nanotechnology to create And severely affect the global economy [6]. The third strategic document on the development of nanotechnology, Iran until 1394 in all three indicators of science, technology and the market to achieve a position of fifteenth in the world in nanotechnology. On this basis, the following indicators for continuous monitoring of Iran's position is done:

1) Rank in the production of science: the index number and quality of scientific papers ISI. By the end of January 2013, our researchers have been able to article 3650 ISI, the world's eighth gain.
2) Rank in production technology: the index number of international patents. Iran has registered 25 patents in 2012, ranking 29th among the world countries achieved.
3) Rating on the economy Nano: Nanotechnology Index market share and production [7].

Also, we see a glimpse of the research areas of nanotechnology as one of the priority areas known among researchers. Definitely one of the most important factors in creating this space management, support ongoing implementation of the incentive program is Nanotechnology. This function Iran's stance has upgraded the fifteenth Rank Rank sixtieth world. If three basic steps for research in nanotechnology, including persuasion, focus and competitiveness know, It can be argued that the first step has been taken well . In this step, the scientific community with a mechanism to encourage, to urge the nano And the potential of nanotechnology researcher Force has been created in the country. Now is the right time to take the second step, the focus of the research potential in the priority areas of the country. Now a few general areas including medicine and health, energy, environment and construction As priorities in nanotechnology have been proposed [5].

Further development of nanotechnology applications based on third strategy document which covers the outlook to 1393, are as follows:

1) Promotion and public education to increase stakeholder participation in the development and application of Nano nanotechnology.
2) Facilitate and strengthen the necessary infrastructure for the development of comprehensive, timely, balanced and sustainable Nano.
3) Promote international cooperation and interaction.
4) Development of human capital and benefit from the Nano and promote problem-oriented research.
5) Leading nanotechnology research targeted to achieve key technologies.
6) Facilitate and accelerate commercialization by providing needed services technology development Technology and knowledge-based companies.
7) Promotion of industries Nanotechnologies and Nano-expanding market.
8) Policy and assessment objectives, strategies, policies, programs and agencies Nano [8].

Commercialization Concepts and Processes

Create contexts for knowledge, In addition to providing significant economic value for organizations, Leads to economic growth and technological society. Since delivering a product to market can guarantee the success of organizations is survival levels, Commercialization of technology as a vital factor has been proposed. The research organization also without product commercialization, research does not make sense. Without access to specific customers a product, production or testing, in the case of a useless idea seems. The importance of technology commercialization to the extent that we research institutes benefiting from counseling and research projects for joint collaboration to commercialize its technology have been recognized And the number of such centers in advanced industrial services is increasing day by day [9]. According to reimer, the commercialization of new process technologies become commercially successful products. In other words, the commercialization of various array of important processes, including technical, commercial and financial that makes new technology products or services are useful. This process includes activities such as market assessment, product design, engineering, manufacturing, intellectual property rights management, marketing strategy development, capital raising and training of workers [10]. Technology commercialization process is defined That the transfer of knowledge and technology from an individual or group to another person or group in order to use it in the system, process, product, or a work method [11]. The important point to mention that in connection with the commercialization of technology in research institutions should be considered, It is commercialized, expensive and long- term process. Several evidence from around the world suggests that although a large number of investigations have been successful from a technical perspective But only a small percentage (12%) of them have achieved success in commercialization This reflects the complexity of the commercialization process. Commercialization is an important part of the innovation process without which no technology and products will not be marketed successfully [12].

The Role of Nanotechnology in Commercializing new Technologies

Master key of today's world, to create value. The entry approach to the commercialization world today is technology and the key technology commercialization and value added by them. In other words, technology commercialization link between technology and the market and its focus on the value chain is the end rings [13]. In marketing literature and market research, many studies have been done on how the commercialization of products, However, in comparison with other products commercialization, commercialization of new ideas, especially ideas related to emerging technologies has been less attention [14]. Since private organizations delivering a product to market can guarantee the success and survival of the organization, In research organizations as well as non-commercialization of a product, research is meaningless, Because without access to certain clients of a product, manufacturing or testing, about a useless idea seems [15].

Nano develop a variety of programs such as the promotion and training of staff, published articles, reports and monthly, festivals and international conferences, Financial support, networking, provision of infrastructure, standardization, Empowerment courses and many other applications in order to achieve the strategic document developed nano, runs each year. One of the most important programs supporting commercialization of new technologies by applying different strategies. In general it can be said, the main activities to support the commercialization of Nano includes:

Supporting early-stage companies, Nanotechnologies in existing companies, and support for nanotech companies to achieve an appropriate share of the national and international markets. Nanotechnology policies, including new technologies can be mentioned the following:

promote nanotechnology education: intellectual infrastructure and to prepare the minds of individuals and institutions to embrace nanotechnology, it is necessary for sustainable development. Launch Site Nanotechnologies for students, organizing and supporting more than 250 conference promoting the education for students and teachers, publishing and educational bulletins, develop and publish educational books and CDs, Among the tasks that each is designed with a specific purpose and a specific audience.

Development of human resources: from the beginning of the 1383 incentive program for human resource development as a supporting program begins, Among its objectives, motivate researchers to direct their research toward nanotechnology country. Promotional support programs, research activities in nanotechnology researchers who are doing. The amounts paid as incentive .With support program of incentives, research, data collection and the establishment of comprehensive databases of nanotechnology also begins, The current record of all individuals and institutions in the country and its institutions. Incentive Support Program, after five years, albeit with slight variations, is still running.

Laboratory network: with the start of nanotechnology research, the need for advanced equipment for precision manufacturing and measuring materials at the nanometer scale increasing it. By evaluating existing equipment and requirements of the country, nano lab is proposed networking solution and nanotechnology laboratory network is formed .Training of technicians, repair and calibration of instruments, providing financial support to upgrade and purchase new equipment ,Provide advice and assistance to purchase equipment to achieve international standards Network members provide services that laboratories

Iran's Participation in the International Effort to Standardize of Nano

The end of the 1383 international nanotechnology standardization begins. Proposed forming a committee for nanotechnology standardization in the International Organization for Standardization (ISO) is introduced and passed. The committee as ISO / TC229 is formed in the presence of 23 active members and 7 observers. Iran initially accepted as a member of the Committee, and team- working with the joint management of staff and the Standards and Industrial Research of Iran, For the corresponding International Committee of the country. Iran Nanotechnology Standardization Committee for continuous and active presence at meetings of the International Committee is six months [5]. In recent years, despite the rapid development of many technologies in the laboratory, Barriers to commercialization including expansion of these technologies is nanotechnology is also not an exception. The commercialization of a research project, different categories infrastructural, cultural, and economic management are involved which can do a challenge, commercialization process delay [15]. Undoubtedly, to facilitate the development and commercialization of nanotechnology in the country should set various obstacles in front of researchers, entrepreneurs and artisans harvest. However, it seems that some of these barriers are more restrictive than others. Some of these obstacles are mother and other problems can be dealt with on its own fix them many problems. According to studies conducted interviews, The most important challenges identified in the field of nanotechnology commercialization are as follows:

1) Lack of knowledge and lack of culture of consumerism consumers.
2) Lack of technical knowledge or formulation of the application of nanotechnology in industry.
3) Weak intellectual property rights.
4) Lack of familiarity Commercialization owners with Commercialization model.
5) Economic sanctions.
6) Lack of centralized management on projects and they are not being targeted.
7) High investment risks in the field of nanotechnology.
8) Lack of constructive interaction between the researcher and capital owners [15].

As described in the section "introduction of Nano, history and actions" stated, The sixth program sets third graduate programs technology strategy document, Facilitate and accelerate commercialization by providing needed services technology development Technology and knowledge-based companies are that the importance of the commercialization process of innovative ideas in the country.
Targets, indicators and program staff in order to promote the development of nanotechnology commercialization of new technologies can be expressed as follows:

Program aims to facilitate and accelerate commercialization by providing needed services technology development Technology and knowledge- based companies in the headquarters of the development of nanotechnology:

- Increase the success rate ideas and technologies to enter the market.
- Accelerate the transition to a market idea or technology
- Strengthening commercial brokerage services [8].

Staff indicators Nanotechnology:

- Average arrival time to market technologies
- The success rate of technology transfer to the industry or get them to market.

- Cover all stages of commercialization
- Absorption technology to the commercialization stage
- The market for commercial services in nanotechnology
- The economic value created by Commercialization technology [8].

Conclusion:

Nowedys technology as a factor for converting inputs to outputs that creates competitive advantage, is known. Due to the fact that today the difference between developed countries and developing countries due to technological thinking and its impact on development and economic growth, and according to some experts who believe that research and education, new technologies and orientation effective and appropriate use of technology or commercialization of creating wealth, The use of research results or commercialization of technology resulting from research and development centers and research knowledge is critical, These centers will be as dynamic as the result of their work properly transferred to the external environment, Otherwise, they will be depressed. As stated, costly and long-term commercial processes, According to global statistics so that only a small percentage (12%) of commercialization of research have achieved success and of every 3,000 raw ideas, just an idea to be successful in the commercial market.

Due to the commercial importance of technology in modern times has been more and more evident and many countries, particularly developed countries have invested a lot in this area and have achieved remarkable success, It is time that our country has taken important steps in this area. Research centers, universities and parks, science and technology can play an important role in the commercialization of new technologies, played and to foster young people's ideas and using research findings provide researchers develop and the development of the country. In addition to the aforementioned institutions, main responsible development of new technologies in the country and responsible for implementing the policies and programs of strategic documents developed Nanotechnology Nanotechnology is the headquarters. The campaign, a variety of activities in various fields ranging from education and promotion, financial support, seminars and festivals, publishing and commercialization of innovative ideas and technology and so on. One of the most important activities, programs and develop indicators and strategies to facilitate and accelerate the commercialization process. In general, the main activities to support the commercialization of Nano as follows:

1) Support early-stage companies,
2) Nano-technologies in existing companies,
3) Support for nanotech companies to achieve an appropriate share of the national and international markets.

The main goals of staff development in order to facilitate the commercialization of nanotechnology, increase the success rate ideas and technologies to market, accelerate the transition to a market idea or technology, and strengthen commercial brokerage services building. Accordingly, the present article examines the role of Nanotechnology in the commercialization process and supporting new technologies activists theory. It is hoped that, with the support of the headquarters, effective steps to achieve the goals

and visions of the country's development programs have been taken And this campaign as trustee advance new technologies to accelerate the country's growth and prosperity act. It should be noted successful in this way, attention and support relevant authorities and detailed planning is in this arena.

References:.

[1] Rafiee Tabar, H. (2005). Nanotechnology and its applications in medicine and pharmacy. Shahid Beheshti University of Medical Sciences and Health Services. Vol. 29. No. 2: 111-115.
[2] Hoseinzadeh, E., and , Afshari, H. (2005). Solution for commercial development of technology in Iran (Case Study: Staff of Nanotechnology in the short-term. Second Conference on Technology Management.
[3] Fakour, B. (2007). An overview of the theoretical concepts commercialization of research results. Approach. No. 37: 24-32.
[4] http://corridor.nano.ir/index.php?ctrl=paper&actn=paper_view&lang=1&id=945
[5] www.nano.ir
[6] Khosropour, H., et al., (2013). Analyze strengths, weaknesses, threats and opportunities, and prioritize strategic nanotechnology industry in Iran. No. 254: 27-32.
[7] Journal of Nanotechnology (2014). Evaluate the development of nanotechnology in Iran, Iran rank. Vol. 7.
[8] The third supplementary document ten-year strategy for the development of nanotechnology in the Islamic Republic of Iran Nanotechnology Initiative Council (2012). Future Strategy 1390- 1393. Tehran supplementary document.
[9] Kaylson, M. (2004). Commercialization ofresearch results in United States. Anoverview of federal and academictechnology transfer.
[10] Reamer, A., and et al., (2003). Technology Transfer and Commercialization: Their Role in Economic Development Georgia Institute of Technology, online available at:http://www.eda.gov/Image Cache /EDAPublic/documents/Pdfdoc/eda_5fttc_2epdf/v1/eda_5fttc.pdf.
[11] Andrew, O., Martyniuk, R. K., Meredith, J., and Haft, N., (2002). Market opportunityanalyses and technology transfer ",International Journal of TechnologyTransfer and Commercialisation ,Vol. 1. No.4: 385-404.
[12] Bandarian, R., and Astringent, R. (2009). Benefits and challenges of commercialization of research results research centers in existing industries. Journal of Technology. Vol. 6, No. 4.
[13] Allen, R., (2003). Bringing New Technology to Market. Prentice Hall, NEWJERSY.
[14] Jolly, V. J. (1997). Commercializing new technologies: getting from mind to market. Boston, Massachusetts, Harvard Commercialization School Press.
[15] Tabatabaian, H., et al., (2010). Determine the current challenges facing the commercialization of emerging technologies in Iran (Case Study Nanotechnology). Journal of technology development. Vol.5, No.4: 51-78.