

The Factors Hindering Innovation at Iranian Smes

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Abstract: Innovation is the key to the economic development in today's knowledge driven economy. World markets increasingly demand knowledge-intensive production and innovation-based competition. Iran still remains largely a natural-resource-based economy. To become competitive in today's market it needs urgent shift towards a more knowledge-based economy which requires strong innovation system. This study aims to investigate the factors hindering innovation process at Iranian SMEs by examining the systems responsible for innovation management and surveying 235 manufacturing SMEs in Iran. The goal of the study is to develop an innovation management framework for Iranian SMEs based on the survey results.

Key words: Innovation • SMEs • Policy • Entrepreneurship • Education • Reform

INTRODUCTION

Today the economic environment changes have increased global competition. The competitiveness of an enterprise is based on its availability of knowledge and its application in successful innovations [1]. Firms can obtain a competitive advantage over other firms, when they possess firm specific knowledge and manage it in a way that is difficult to imitate¹. An improvement of existing innovation processes, knowledge creation, its sharing and integration are primary elements of a company's success in the market. Innovation management correlation to a company's competitiveness and marketplace success are proven by several empirical studies.

Slaughter and Shimizu define innovation as the actual use of nontrivial improvements in products, processes or system that are novel to the organization developing [2]. Innovation management is a specialized area of research management that aims to create strategies to introduce new technologies within the organisation, processes and innovative products [3]. Innovation can deliver four types of benefits beside cash: knowledge, brand, ecosystem and culture. But the most important reason for innovation in organisation is to make profit. Firms make profits by offering products or services at a lower cost than its

competitors or by offering differentiated product at premium prices that more than compensate for the extra cost of differentiation. Firms should be supported by its strategy, structure, system and staff. Competences and asset are the function of technological and market knowledge as innovation is the use of new technological and market knowledge to offer to a new product or service [4].

Innovation process is an adoption of new ways of making products or services [5]. The significant role in an innovation process plays the flow of knowledge, its usage and handling. Thus, knowledge is the fuel for innovations [6]. The ability to transfer knowledge in the innovation process makes added value for the company, increases levels of its performance and is a challenge for any organisation. Knowledge innovation is strongly affected by two main drivers: education and science. If these are effectively managed, knowledge can be acquired and implemented into knowledge innovation² (Figure 1).

In the knowledge-driven economy, innovation is the key to the economic development. Its management plays major role in economics of the developing countries. Therefore, the goal of this paper is the identification of the factors hindering innovation at Iranian SMEs (Small and Medium Enterprises) and development of the framework for them.

¹Earl, M., 2001. Knowledge management strategies: Towards taxonomy. <http://staffweb.ncnu.edu.tw/hyshih/download/KM/Paper/KM%20strategy%20taxonomy.pdf> (accessed on 05 October, 2010)

²UNCTAD. Science, Technology and Innovation Policy Review. The Islamic Republic of Iran, 2005. http://www.unctad.org/en/docs/iteipc_20057_en.pdf (accessed on 09 November, 2010)

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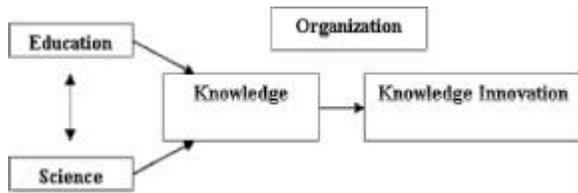


Fig. 1: Basic Elements of Knowledge Innovation

Table 1: Average Contribution of Economic Sectors to GDP (%)

Sector	2009
Agriculture	10.9
Industry	45.2
Services	43.9

Current Situation of Smes and Innovation Management in Iran:

The Islamic Republic of Iran has pursued a development strategy of self-reliance with some degree of success. Endowed with abundance of oil and natural gas resources, Iran did not face import constraints. Yet, it adopted an import substitution policy that allowed it to use its oil revenues to acquire foreign technologies to industrialise. Iran is a middle-income developing country, with a broad industrial base, a relatively well developed science and technology infrastructure and skilled manpower.

Iran's economy is largely dependent on the primary sector. Since 1990, Iran's economic plans have emphasised a gradual move towards a market-oriented economy and development of the private sector. Recently, the reforms approved by the government are as follows [7].

- Approval of the Foreign Investment Promotion and Protection Act, aimed at simplifying the inflow of foreign capital and easing of technology transfer from abroad;
- Liberalisation of foreign trade through the elimination of non-tariff barriers and regulations for contract deposit;
- Equalisation and reforming the system of exchange rates, aimed at increasing transparency in the government budget and subsidies;
- Direct Tax Law reform, consisting in the reduction of corporate taxes from 54 to 25 % and personal income tax rates from 54 to 35 %;
- Banking System reform, through the establishment of non-banking credit institutions and private banks.

The average contribution of the economic sectors to GDP (Gross Domestic Product)³ is reflected in the Table 1.

Iran's manufacturing industry has been built up mainly through licensing of technology from abroad and in some cases through reverse engineering. State-owned enterprises which are mainly large enterprises continue to account for much of the industrial sector. Small and medium-sized enterprises make a relatively very small contribution to the national product. Large enterprises (which are mainly state-owned), by developing technologies relating to components and parts and diffusing these technologies to SMEs, can build up a strong supplier industry within the country. Several other developing countries such as India and China have followed such a strategy. SMEs create employment and are dynamic, adapting to economic changes relatively quickly. SMEs are also observed to be more innovative than large enterprises. The experience of many countries has shown that the Small and Medium-sized enterprises (SMEs) can make a substantial contribution to industrial and economic development.

Iran Small Industries and Industrial Parks Organisation (ISIPO) is a developmental organisation affiliated to the Ministry of Industries and Mines which established by amalgamating 'Iran Small Industries Org.' with 'Iran Industrial Estate Co.' in the second half of the year 2005, aimed at planning and developing industrial parks/areas as well as supporting small industries (less than 50 employees), promoting networks and industrial clusters and providing the consultancy services, in frame of Ministry of Industries and Mines general policies.

Considering the fact that 94% of Iran industries are SMEs and regarding the vital role of SMEs in the economic growth, ISIPO applies various supports and services through the provision of developmental programs to increase the competitiveness of SMEs and provides them with infrastructures and facilities. In this regard ISIPO expands its cooperation with industrial associations, public institutions, RandD centres, universities, engineering and consultancy services companies to create the fruitful environment for utilizing and applying new technologies and to make itself knowledge oriented organisation that is flexible toward international transformations⁴.

³Central Bank of the Islamic Republic of Iran: Annual Report 2009-2010. www.cbi.ir (accessed on 21 December, 2010)

⁴Iran Small Industries and Industrial Parks Organization (ISIPO). www.iraniec.ir; (accessed on 15 January, 2011)

ISIPO Offers the Following Services:

Entrepreneurship Supports:

- Supporting training courses for improving the scientific and professional skills of SMEs workforce
- Supporting training courses for promotion of business skills of entrepreneurs
- Organising and holding industrial tours
- Developing Engineering and Consultancy services to Entrepreneurs and SMEs
- Improving business environment

Technology Enhancement of SMEs:

- IT (Information Technology) development in SMEs
- Establishing IT and Software Services centers
- Creating Technology Parks adjacent to the Industrial Parks
- Establishing Business and Technology Service Centers
- Supporting RandD (Research and Development) activities in SMEs.

Market Development and International Cooperation:

- Improving international cooperation for creating new market in the framework of bilateral and multilateral cooperation
- Supporting access to international markets
- Supporting SMEs participation in the national and international fairs and exhibitions
- Facilitating international relations for SMEs
- Cooperating with international organizations for partnership between Iran and foreign SMEs
- Organising and facilitating business trips for SMEs
- Holding and taking part in international seminars for exchanging experiences among SMEs

Consultancy Support: Creating a network of more than 140 highly experienced and professional consultants in different fields such as:

- Management
- Market Development
- Innovation
- RandD technology development
- Productivity and Quality Improvement
- Human Resource

Financial Support:

- Providing soft loan for investment and renovation
- Guarantee Fund of SMEs
- Subsidizing some part of SMEs consultancy expenses
- Training
- Productivity and Quality Promotion (Granting Small Industries Productivity Award)
- Sub-contracting Development
- Industrial Clusters Development

Yet, Iranian small businesses still suffer from obstacles such as a poor macroeconomic environment of high inflation (about 20 %, with a fluctuation of 9-10 %), high interest rates, burdensome regulations, adverse labour and tax laws, lengthy and arbitrary procedures for securing bank loans, foreign currency shortages, lack of competent business development services and an overall sense of discrimination against small enterprises. The main barriers to SME development in Iran is the lack of access to various kinds of information, such as:

- Marketing information (on domestic and foreign markets, price structures, packaging requirements, etc.)
- Information on the financial and technological standing of SMEs to enable investors to select healthy businesses for their investment
- Technical and scientific information
- Information on raw material suppliers and buyers

This situation is exacerbated by the dominance of the oil sector in the overall economy and of large state enterprises in industrial production. Thus, the potential for subcontracting to SMEs by the large automotive, transport, home appliances and oil industries is yet to be realized.

Iran still remains largely a natural-resource-based economy. Diversification is imperative, not only because natural resources become more accessible but also because export success in world markets increasingly demands knowledge-intensive production and innovation-based competition.

The shift towards a more knowledge-based economy will require creating a national innovation system based on science and technology that would not only merely transfer ready-made technologies, but also engage in re-

invention, developing new technologies and diffusing them economy-wide. There is need to better link the science and technology infrastructure to the needs of the productive sector generally and in particular building up capabilities in high technology areas.

Today, the main actors in the Iranian national innovation system are government, research institutes/universities and large enterprises. Almost all of the research institutes/universities and an overwhelming majority of the large enterprises are also state-owned. Therefore, due to this government ownership, there are close links between the research institutes/universities, large enterprises and government. Other actors such as SMEs, business corporations, business supporting organizations and consumer groups are very weak and play almost no role in the system. As a result, user-producer relation is weak and innovation activities in Iran are not very much demand-driven. The absence of private enterprises that base their innovation strategies on conditions of demand and competition makes it difficult to derive larger economic benefits from innovation. Such larger benefits that Iran is not, presently, realizing would include opportunities for commercializing new products, emergence of spin-off enterprises and new entrepreneurs, etc.

The key driving force for innovation and technological change is competition. Whereas, Iran's industrial sector lacks effective competition. The system of licenses and resource allocation (subsidies) ensures that there is only limited competition (and mainly based on price) in the vast majority of industries. This lack of or limited competition does not motivate companies to develop new products or product features. Recognizing this, the Government is gradually opening up the economy to competition, but the process is very slow.

A unique feature of Iran's innovation system is the marginal role played by foreign companies. Foreign companies bring in new technologies in the form of new products, processes and management techniques. The local operations of foreign companies lead to spill over effects and diffusion of new technologies into the wider economy. They also spur competition and motivate

domestic companies to upgrade their technologies and innovate in order to compete. The Government has established free zones where foreign companies can locate operations, which can create a new opportunities for FDI (Foreign Direct Investment).

Although Iran has a fairly well developed manufacturing capacity in the automotive industry, telecommunications and pharmaceuticals, enterprises only undertake production and do not perform innovation activities. Such a strategy is sufficient to cater to an import-substitution economy yet it does not result in a dynamic capability for sustainable development. Moreover, even large manufacturing enterprises rely on imports for inputs. This is mainly because of the absence of strong support industries (supplier networks in the form of small and medium-sized enterprises) in Iran.

Innovation Process at Iranian Smes: The key industries in Iran are petroleum, gas, petrochemical, steel, weaving, food processing, car, electrical and electronics industries. Due to out-dated machinery and insufficient innovation management except petroleum and gas, not many other Iranian industries have been able to play a significant role in international commerce and their production barely satisfies domestic demand. The handicrafts and traditional industries, such as carpets and ceramic industries, are also considered to be the key local manufacturers, but even the Persian carpet, which used to be widely welcomed in western countries, has lost its share of the market to the new rivals from Turkey, India and Pakistan⁵. The productivity figures of industrial SMEs in Iran are much lower than the corresponding figures for other developing countries. Recent figures spanning a five-year period indicate only a small improvement of 1.2% per annum in labour productivity⁶. The fact that most of the local products, especially in the garment industry, use foreign labels attests to the fact that the public image of the quality of the local products is not positive. The abundance of foreign goods in the Iranian market and the booming businesses of the shopping centres in the Free Economic Zones are other indicators of the low level of public trust in domestic products. In spite of the fact that 80 % of Iran geographical area is made of natural range

⁵Tony Zohari, 2008. Iranian Government Globalization Policy Impacts on SMEs and the Corresponding Effect on Iranian-Swedish Trade, Universitet Stockholms. http://www.digitpro.co.uk/paper/iran_sweden.pdf (accessed on 23 October, 2010)

⁶UNIDO, 2003. Strategy Document to Enhance the Contribution of an Efficient and Competitive Small and Medium-Sized Enterprise to Industrial and Economic Development in the Islamic Republic of Iran. http://www.unido.org/fileadmin/user_media/Publications/Pub_free/Strategy_document_to_enhance_contribution_of_efficient_and_competitive_SME_sector%20_in_Iran.pdf (accessed on 09 November, 2010)

land, forest and arable land, Iran is one of the world's largest net importers of agricultural products, importing 20-40 % of its annual food requirements. The deficiency in the production is not caused by the unavailability of land, but the shortage of water, out-dated machinery, raw material and insufficient farming techniques.

Education plays significant role in innovation management. As knowledge is becoming increasingly important, the university is becoming a crucial part of innovation that produces and disseminates scientific and technological knowledge. It is getting much more important to industrial innovation. Faster technological development, shorter product life-cycles and more intense global competition have transformed the current environment competitive for most firms. This new competitive landscape forces the organizations to actively acquire knowledge since a firm's advantage is now more dependent on continuous knowledge development and enhancement. Innovation is increasingly related with the firm's ability to absorb information, knowledge and technology. Many of the new products can be traced to the interactions and partnerships between the firms and various institutional actors (such as universities and RandD institutions) which are becoming the engines of innovation [8].

In spite of the fact that education plays major role in innovation, higher education in Iran suffers from an overall lack of quality. Much of this can be traced back to ineffective management of human as well as natural resources, increased enrolments, a shortage of technology, outmoded and traditional instructional methods largely based on memorization and improper incentives for teachers and students. Today, with the increased speed of information and telecommunication technology, many changes have occurred in society. However, Iran's old higher educational system doesn't have the capacity to meet current social needs. It faces numerous challenges and obstacles and needs urgent reform and transformation. From 2001 to 2006, Iran allocated the average of % 0.6 of its GDP to RandD⁷, which ranks it far behind the industrialized countries.

According to UNESCO (United Nations Educational, Science and Cultural Organisation), higher education has three functions: knowledge production (research),

knowledge transfer (education) and knowledge distribution (service). Iran's educational system is based on knowledge transfer, with little concern for research and services. One of the most important challenges in this respect is the lack of demand from industry. About 70 % of industry is state-run, with the private sector so undeveloped and weak that cannot afford to invest on research. The state-run sector fulfils its needs by purchasing technical information from developed countries with its oil profits. In such a situation, there is no need for RandD as all needs can be met from outside sources⁸.

The cooperation between the business world and universities is poorly developed. As a matter of fact, such practices are not really encouraged. Part of the problem is keeping down the ailing state of industry, unable to act as a viable partner, while cooperation with SMEs is extremely weak. Universities and businesses operate in different worlds: one concerned with the short-term, day-to-day business survival (SMEs); the other more concerned with the longer-term, the development and delivery of education (the university community)⁹. In addition, because of the lack of the mutual links between university and industries, the higher education is not coordinated with the needs of changing marketplace and people; this is an important element of unemployment as well as prosperities rate among higher education graduates.

Currently, 106 public universities have established Innovation and Entrepreneurship Development Centres in Iran. These Centres offer various courses for people who want to start up an entrepreneurial business or company. Several universities and institutions are established to offer courses in entrepreneurship education. Yet, only few elective courses are designed and offered on a regular basis such as 'Introduction to entrepreneurship' and 'Fundamentals of Entrepreneurship Management'. The purpose of these two courses is to introduce students to issues related to principles and skills required for preparing a business plan, starting up and managing a business. Most of these courses suffer from a number of shortages among which can be mentioned:

The lack of experienced professionals as faculty members in teaching entrepreneurship education subjects. Teachers lack awareness about their lesson plans,

⁷World Bank, IRN Country Meta Data 2009. <http://data.worldbank.org/country/iran-islamic-republic> (accessed on 21 December, 2010)

⁸Rasian, Z., 2009. Higher Education Governance in Developing Countries, Challenges and Recommendations: Iran as a case study. Nonpartisan Education Review/Essays. www.npe.ednews.org/Review/Essays/v5n3.htm (accessed on 21 December, 2010)

⁹Gribben, A.A., Entrepreneurship Learning: Challenges and Opportunities, 2006. [www.etf.europa.eu/pubmgmt.nsf/\(getAttachment\)/2F034A6BC7FCB94BC125723400373D47/\\$File/NOTE6VYDT3.pdf](http://www.etf.europa.eu/pubmgmt.nsf/(getAttachment)/2F034A6BC7FCB94BC125723400373D47/$File/NOTE6VYDT3.pdf); (accessed on 12 October, 2010)

objectives, contents and teaching methods in teaching entrepreneurship education. In addition, Iranian instructors at the higher education are not paid high salaries. The teachers are often hired through personal connections and networking ability rather than their competency. As a result, many faculty members are under-qualified and of out-dated knowledge and skills.

Technological Shortages Such as:

- A poor infrastructure of equipment, facilities and services, such as high-speed internet, advanced computer systems
- Few curriculum designers or faculty members experienced in e-learning
- Unreliable telecommunication services
- Students' poor ability of English language
- Limited access to information and information technologies

To assess better the current innovation status and to reveal the factors hindering innovation at Iranian SMEs, I have conducted a phone survey. 400 companies and their contact details were selected from www.sme.ir. Structured questionnaires were used during the phone interview with the managers/owners of the selected firms. The questionnaires included the following questions:

- Did your firm launch any new product or/and services during the period of 2008-2010?
- Did you upgrade technologies during 2008-2010?
- Did your employees take any training courses during 2008-2010?
- Did you use e-commerce during 2008-2010?

From 400 companies only 235 were finally selected because some of the firms did not provide complete information and some just refused to participate in the survey.

According to the survey results, twenty five of the firms launched only new products and services, seventeen of them only upgraded technologies, sixteen only paid attention to the human resources training, seven firms adopted only e-commerce and more than one innovation process took place at nineteen firms. The results of the survey are presented in the diagram 1.

The results show that innovation process took place only in 84 firms from total 235, which comprises 35.74%. Obviously innovation process is underdeveloped at Iranian SMEs. The main causes of the innovation lack, according to the answers of the interviewees, can be summarized as follows:

The Lack of Financial Resources: Some of the firms' owners mentioned that they had difficulties even to pay salaries. The main financial obstacles are high taxes and interest rates, long and difficult process of obtaining loans, absence of financial support by the government and banks.

The Lack of Skilled Human Resources: The lack of skilled labour is accounted for by the fact that Iranian Higher Education in business management and entrepreneurship is based rather on theoretical aspects and memorisation than on development of analytical and creative skills. It does not prepare specialists for competitive challenges of the global marketplace, technological and communication paradigm shifts and the flexibility to adapt to rapid and abrupt changes in the business environment. Higher education does not meet the needs of the industry; at the meantime the SMEs do not have financial resources to send such employees to training courses.

The Lack of Technical and Scientific Information: SMEs do not have free access to technical and scientific information whereas information about new technological innovation and products can assist their development through innovation.

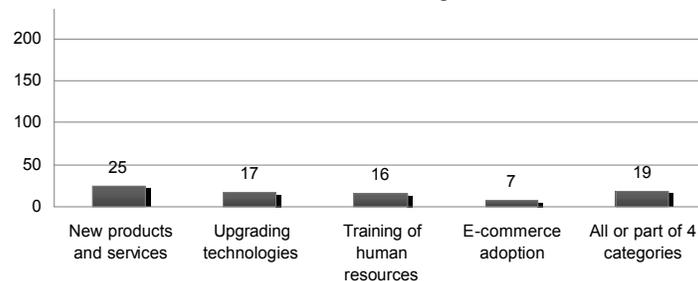


Diagram 1: Innovation Process among 235 Iranian SMEs 2008-2010

Conclusions and Sugestions: Although Iran is richly endowed with both natural resources and well educated scientists and engineers, this potential advantage has not yet been capitalised for achieving the transition from an oil-driven to innovation-driven growth because of the weaknesses in the national innovation system. The contribution of the enterprise sector to innovation activities is weak and should be strengthened. Enterprises are mainly production units rather than technology developers. All innovation activities are concentrated in the research institutes and universities. SME development should not be confined only to high tech sectors. It is important to create the linkage between all kinds of SMEs and Universities/RandD Centres. Innovation must take place also through new business models, new ways of organizing work and innovation in design or marketing. Managing and applying all these different kinds of innovation is a major challenge to businesses today which requires corresponding education and training. Today in Iran, there is no organisation developing methods and tools to support innovation management in all kinds of SMEs and though there are organisations providing training, consulting, technical and other services (The Technical Vocational Training Organisation, 5110 private training institutes, ISIPO, etc.), most of the SMEs do not have enough financial resources to use them.

Development of innovative SMEs requires dynamic entrepreneurs. Presently, entrepreneurship is weak in Iran. This is partly explained by the lack of opportunities, financial and technical support services and clarity with respect to ownership of private property as well as a weak intellectual property rights regime. Government should address these problems, promote and encourage entrepreneurship. It should form specialized agencies to provide seed capital and encourage banks to develop 'venture capital' activities. Such financing mechanisms will promote entrepreneurship by reducing the risks to individuals and thus, resulting in greater commercialization of innovations.

The access to the technical and scientific information plays significant role in the growth of the SMEs. Such information must be available not only to the Universities and RandD centres free of charge but also to SMEs.

Education plays the major role in creating innovation-driven economy. It should prepare specialists with the knowledge and skills required in today's labour market. The education system of Iran lacks up to date teaching methods and technics.

By promoting the creation of local enterprises, which are flexible in responding to demands from potential users and by adopting incentives for them to innovate, Iran could develop a competitive productive capacity in both capital and consumer goods for its large domestic market and become an export base for manufactured goods to the Middle East and Western Asia. Movement in this direction would help reduce unemployment and in general contribute to poverty alleviation and the development of local communities in the most remote areas of the country.

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