

## **Iran Science Parks' Strengths, Weaknesses, Opportunities and Threats: Influences of New Technologies**

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### **Abstract**

Today, we are experiencing rapid changes in the information technologies and these new technologies have caused dramatic changes in the economic structure. Most of the businesses are attached to no territory and they can fly and move from one place to another almost without any constraints. Those huge bricks-and-mortar organizations are gradually replacing by clicks-and-mortar organizations which can fit their main assets in a small briefcase containing a laptop computer and a cell phone.

In this paper, we have investigated the influences of these new technologies on the Iranian parks and explained the strengths, weaknesses, opportunities and threats they are facing with in the new economy.

### **1. Introduction**

Today, we are experiencing rapid changes in information technologies and new information technologies have caused dramatic changes in the economic structure. Most of the businesses are attached to no territory and they can fly and move from one place to another almost without constraints. Those huge bricks-and-mortar organizations are gradually replacing by clicks-and-mortar organizations which can fit their main assets in a small briefcase containing a laptop computer and a mobile phone.

New technologies have both some advantages and disadvantages that should be considered by all the organizations which want to be successful in the new economy. As an example, consider Internet which is one of the most influential technologies have appeared in recent years. One of the advantages of the Internet is expanding the size of the market. This advantage can be an opportunity or a threat at the same time. If an organization can attract more customers from all over the world, it will be an opportunity; otherwise if the organization current customers are attracted by another organization, this opportunity will become a threat.

In this situation, science parks must carefully think about what their role will be from now on, what changes must be implemented and how they should perhaps be re-engineered.

Our aim in this research can be divided into two main parts. First, we are investigating the influences of new technologies on Iranian science parks. Among the all existing technologies, we will concentrate our efforts on Internet which has been the most influential technology in recent years. Second, we will identify the strengths, weaknesses, opportunities and threats which our science parks are facing with in today economy as a result of new technologies. We believe the information would be so helpful in planning the short- and long-term strategies of the country.

We organize the rest of the paper as follows. In section 2, we explain the influences of new technologies on the industry. In section 3, we concentrate our efforts to investigate the new technologies impacts on science parks. Strength, weaknesses, opportunities and threat of Iranian parks will be described in section 4. Finally, in section 5, we draw conclusions.

## **2. New technologies and their impacts on the industry**

Today, we are experiencing dramatic changes in the economic structure as a result of new technologies. Most of the businesses are attached to no territory and they can fly and move from one place to another almost without constraints. Those huge bricks-and-mortar organizations are gradually replacing

by clicks-and-mortar organizations which can be established by minuscule capital.

Among all the new technologies the Internet has had the highest impact on the industry. So in the rest of this section, we are going to concentrate on the effects of the Internet in the industries.

The Internet has created some new industries, such as on-line auctions and digital marketplace. However, its greatest impact has been to enable the reconfiguration of existing industries that had been constrained by high cost of communicating, gathering information, or accomplishing transactions. Distance learning, for example, has existed for decades with about one million students enrolling in correspondence courses every year. The Internet has the potential to greatly expand distance learning, but it did not create the industry. Similarly, the Internet provides an efficient means to order products, but catalog retailers with toll-free numbers and automated fulfillment centers have been around for decades. The Internet only changes the front end of the process.

Whether an industry is new or old, its structural attractiveness is determined by five underlying forces of competition: 1) The intensity of rivalry among existing competitors; 2) The barriers to entry for new competitors; 3) The threat of substitute products or services; 4) The bargaining power of suppliers and 5) The bargaining power of buyers.

Each of these forces has some advantages and disadvantages which are illustrated in Figure 1. It is also worth noting that the pros and cons, which are marked by positive and negative signs in the picture, are determined from view point of existing industries.

## **3. Influences of new technologies on Iran science parks**

The major effect of new technologies on science parks is the transition from industrial society to information society.

The industrial society and economy were marked not only by solid products (manufactured by powerful heavy industries), but also by solid concepts, categories and even systems. The economy was mostly labor-intensive, a company's main assets were its hardware, its massive production plants, filled with machine-tools and imposing equipment where hundreds or thousands of workers would go every day. This hardware-based character had, among other things, a very important consequence: industries were deeply attached to a territory (a city, a region, etc.), in other words, they were rooted; their fate was linked to that of their city or region and most of their workers were from the same region too; industrial companies paid their taxes to their local or regional administrations (or to the national government as the furthest possible institution). This tangible fabric of the economy was also evident in its outputs. Companies of the industrial society manufactured solid products, products that could be counted, packed and shipped. But all this has suddenly changed. Today's leading businesses (those with greater value-added and power) are attached to no territory in particular, and they can fly and move from one place to another almost without constraints. Up to a certain extent, those huge brick-and-mortar plants of the past have been miniaturized: the main assets of a company in the KE fit now in a small briefcase containing a laptop computer and a tiny cell phone.

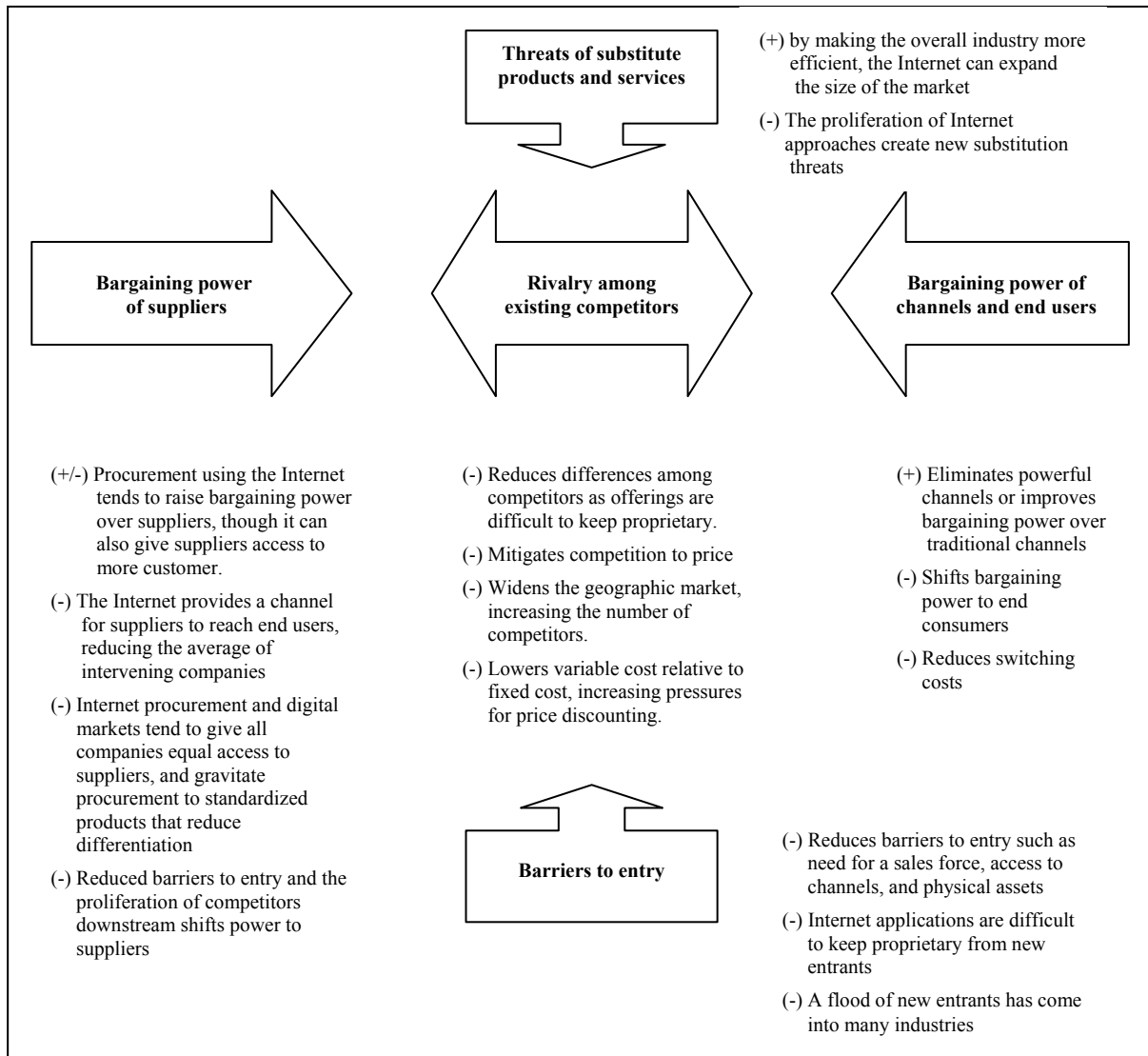


Figure 1. The influences of Internet on industry structure (Source: Porter, 2001)

In addition to these dramatic changes in the structure of the economy and their high impacts on the science parks, in the following we are explaining the influences of Internet on these organizations. Having the five-fold Porter forces in mind, we are examining the influences of each of these forces on Iranian science parks.

#### a) The Intensity of rivalry among existing competitors

As a result of globalization the importance of park's location and their other physical structures, which are so expensive, are gradually decreasing and the IT facilities that they provide for their tenants becoming more significant. These changes cause the competitive advantages of science parks (IT facilities) to be copied by the others with little expenditure. Furthermore, as the globalization blurring the borders between countries, the numbers of competitors are increasing and the firms would have the opportunity to reside in other countries STPs. All of these happenings would result in raising the intensity of rivalry among existing science parks.

#### b) The barriers to entry for new competitors

As mentioned, one of the impacts of new economy is the ability to establish new organizations, e.g. science parks, with only a few amount of initial capital. The reason of this event is the general trend

toward virtualization. Consequently, these changes have led to the reduction of hindrances for new established parks.

**c) The threat of substitute products and services**

One of the essential changes of the Internet is the market size expansion. Although this feature has little influence on bricks-and-mortar science parks, as we gradually move toward the advent of cyberspace and virtual parks and the numbers of clicks-and-mortar organizations increase, the likelihood of Iranian firms being attracted by foreign parks would intensify. Of course this threat at the same time could be an opportunity for Iranian parks if they can improve their facilities, such that they can absorb the foreign firms.

**d) The bargaining power of suppliers**

We can divide the suppliers of Iranian parks into three groups:

- Universities
- Ministries and governmental organizations
- Research institutes

Since universities, ministries and governmental organization are included as the stakeholders and even share holders of the parks in the case of Iranian STPs, new technologies have not any serious impacts on the relation of these institutes and the parks.

But in the case of research institutes they can easily terminate their collaboration with one park and continue it with another one. Of course, this event is mutual and Internet has also given the opportunity to science parks to change between different research institutes so easily.

**e) The bargaining power of buyers**

The customers of science parks are firms (both new established and old ones) and graduated people. The new technologies have also had some effects on the customers of science parks, and today firms can easily change the park which they reside in as the reduction of switching costs.

**4. Strengths, weaknesses, opportunities and threats of Iranian parks**

One of the most important steps in planning the strategies of an organization is the analysis of strength, weaknesses, opportunities and threat (SWOT analysis) of that organization. Strengths and weaknesses are internal factors over which the organization has some control or influence. In contrast, the opportunities and threats are external issues that the organization can not control.

Usually SWOT analysis is conducted for a special organization in order to design its strategic plan. But in this paper we have conducted an SWOT analysis for the collection of all Iranian parks. This kind of analysis would be so helpful for those organizations which are involved in designing the strategic plan of the country such as different ministries.

It is worth noting that, since we have conducted our SWOT analysis for the whole country we are not considering different Iranian parks as competitors. Furthermore, in our study we have just investigated strengths, weaknesses, opportunities and threats which are related to new technologies.

**4.1. Strengths**

**a) The large amount of educated persons in the field of I.T. and related majors**

Comparing Iran with its neighbors, it is obvious that we have more educated persons in the field of I.T. in our country.

**b) To require few amount of facilities in order to establish new I.T. firms**

The few amounts of facilities and initial capital that is required to establish a new I.T. firm would provide us a good situation for our economy to blossom through investment on high-tech companies.

**c) Long-term strategies of the ICT ministry to improve the communication infrastructures**

Recently, many attempts are made by the persons who are in charge in the ICT ministry to improve the infrastructures which are required for Iranian STPs in order to compete with other parks in the world.

**4.2. Weaknesses**

**a) Low Internet speeds**

Unfortunately, the speeds of Internet lines in our country are so low compare to developed countries. This essential deficiency would lead to more problems such as not to be able to support multimedia or real-time application.

**b) To not obey the intellectual property rights**

As we are moving towards the new economy the importance of high-tech product and the number of high-tech firms are highly increasing. Since the high-tech products can be easily copied by the others, it is so vital for the high-tech firms to be supported by the intellectual property rights. Unluckily, not obeying the IP rights in our country has led to bad consequences in establishing new high-tech firms which form the majority of tenants in all STPs.

**c) The lack of enough security in I.T. infrastructures of the country**

Today we are in the information age and the dominant assets of each firm is its information. In this situation providing the security mechanisms for these information are so vital for the firms, but unhappily in our country security issues have not been paid enough attention.

**d) The lack of e-commerce infrastructures**

In today economy that lots of the trades are being done on-line, not to be able to buy a service or product on the Internet is a disaster and also have bad effects on the efficiency of science parks.

**e) The lack of designing an IT master plan before the beginning of the park construction**

One of the important factors in the success of the science parks is to consider the entire requirements of the park at first and then start to construct the building; but since most of the Iranian parks are now residing in old buildings, their infrastructures are not adequate for a science park. Fortunately, this problem has been recently considered by Iranian parks and Pardis Technology Park is the evidence of this attention.

**4.3. Opportunities**

**a) Assisting Iranian elites who are living outside the country**

There are lots of successful expatriates who are at the edge of technology and are so eager to help their countries. Connecting these people with our parks' tenants would have good effects in the improvement rate of our high-tech firms.

**b) Collaborating with the Iranian instructors in foreign countries**

Today, we are able to communicate and collaborate to Iranian instructors in foreign countries through multimedia applications and use their latest knowledge in different fields via e-learning classes.

**c) A global trend to virtual parks and incubators**

This event could be an opportunity and a weakness at the same time. If we can improve the quality of our science parks and incubators we will have the chance to attract the firms from different part of the world. Otherwise we would lose even our current tenants and also our educated people.

#### **4.4. Threats**

##### **a) The existence of high quality parks in the other countries**

The existence of high-quality firms in other countries such as India is a big threat for our country; since they can easily attract our educated people.

##### **b) A global trend to virtual parks and incubators**

As mentioned in the opportunities section, if we can not compete with other parks in the world, it is very probable to even lose our current tenants and educated people.

#### **5. Conclusion**

In this paper, we investigated the influences of new technologies on our science parks. Among these technologies, we concentrate our efforts on Internet which has been the most influential technology in recent years. At last we explained different strength, weaknesses, opportunities and weakness in the Iranian science parks.

It is important to note that globalization which might lead to virtual tenants and virtual science parks, is probably a very good opportunity for Iranian science parks. Since this phenomenon can bring about a world without strict boundary between countries, firms would be able to reside in every park all over the world. This opportunity is at the same time a big and severe threat due to increasing the domain of competitors for each park.

We believe that without a quick action, Iranian parks could even loose their current tenants. Therefore we strongly recommend parks' managers to care about the upcoming technologies in order to align their short- and long-term strategies.

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