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Organizational Diagnosis of Commercialization in Sheikh Bahaei Science & Technology Park

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ABSTRACT: This article intends to assess organizational factors that affected in commercialization by use of Weisbord's Organizational Diagnosis Model in the Sheikh Bahaei Science and Technology Park. Model's factors include: goals, leadership, compensation, mechanisms of coordination, communication and organizational structure were assessed by a survey in groups of the managers of the park, the commercialization experts in the park and the director or executive chief of companies established in the park. The result indicates the highest scores in goals and leadership factors, compared with other factors of the model. The results also denote the lowest score in the mechanisms of coordination and communication for the studied park.

KEYWORDS: Commercialization, Science and Technology Park, Weisbord's Organizational Diagnosis Model.

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1. INTRODUCTION

According to 1404 Iran's visions, economics of Iran should become knowledge based economy foundations. That will be the first in the region for upgrading the level of per capita income and full employment. Affordable supports for knowledge based companies provides in the incubators to convert their ideas to actual products. Many of the ideas of innovators will be converted to prototype, but a very small percentage of the samples find the possibility of commercialization. Commercialization is not an indicator of success or failure in the science parks. But the science and technology parks aspire to commercialize the products of companies. in addition to the spirit of individuals, financial motivation will be more when commercialization is successful, also they will provide new ideas.
The science and technology parks and incubators provide enough supports to grow new companies.In IRAN, it seems that the science and technology parks and incubators just absorb ever greater numbers of newborn companies and accommodation and training.
Therefore, the question is that how the commercialization of products is excluded that is important and difficult purposes of companies? The science and technology parks have established for more than four decades in the world and over a decade in Iran. But it seems that it is not going to be the best of this potential (solymani, 2012).
According to the Reamer et al. (2003) Commercialization is the process of transforming new technologies into commercially successful products. The commercialization process includes such efforts as market assessment, product design, manufacturing engineering, management of intellectual property rights, marketing strategy development, raising capital, and worker training. Typically, commercialization is a costly, lengthy process with a highly uncertain outcome. The costs of commercialization can run from 10 to 100 times the costs of development and demonstration of a new technology. In the world, less than five per cent of new technologies are successfully commercialized. Even when they are successful, technology commercialization does not happen quickly. According to the Chen (2009) role of technology commercialization is as a mediator between organizational resources, innovative capabilities, and new venture capital. This article has tried to identify organizational strengths and weaknesses of the sheikh Bahaei park in the commercialization of knowledge based companies' products.

2. LITERATURE REVIEW

The evaluations of science and technology parks in the past show success factors; According to Motameni et al. (2012) the success ratio is not the same in different parks and units total manpower employed successfully linked units and establishment period of the company in the park also has a significant relationship with success rate. He explores the seven key factors for success of parks such as: Physical infrastructure, human resources, management, marketing, universities and industries, technology, Venture Capital.
Herbig and Golden (1993)'s research show the parks should be close enough to an urban center to allow easy access to the center but far enough away to avoid the congestion. Their accessibility to the center Improved by the national highway system, having a major airport, and by working to strengthen their attraction to all kinds of business services. Availability of infra instruction is a necessary but not sufficient itself for innovation to occur. Availability of low-cost facilities is a necessity for new venture capital. Koh et al. (2005) investigated that neighbourhood of the private sector with the park has an important role in advancement of progress of the park. According to Phan et al. (2005) there is no systematic framework to understand the purpose of science parks and incubators and the parks should note the dynamic nature of knowledge based company. There is a lack of clarity of science parks and incubators purposes. Salami (2010) explains that the manager's performances are important success factors in the parks. Available studies (Ferguson and lofsten, 2004, salami, 2010) provide the management and business training to the residents of the park as the main factor of success

parks. Salami (2010) suggests the logical relationship between the activities of residents of the park and the faculty members and graduate students, the University is an area that can cause synergy of activities and increase the efficiency of parks. Topology of the park should respond to the development of equipment for the residents. Planning and management of parks are a specialized task and there is no doubt, lack of expert managers will be an obstacle for the success of the parks. The 28 factors arranged under four following viewpoints: Management, Support, Cultural and Social. Bahari et al. (2012) find four important key factors in the success of parks such as: supporting operating of knowledge based companies, human resource, related infrastructures, development factors and development of technology centers. Amir Ahmadi (1985) investigates in a case study of UK science and technology parks since 1985 up to the 1993; one of the key success factors is diversity in the form of parks. Moreover, Parks should collaborate very closly with universities and industries. Technologies should transform from the parks to industries and venture capital should facilitate financial supports.The last factor is the need to pay more attention to the purposes of the parks.
In accordance with what is stated in the introduction and review of evaluation in the science and technology parks, there is a lack of attention to commercialize the products of companies. In this research, choosing commercialization for indicators of the science park's success is our favorite.

2.1. Study of Commercialization in Knowledgebase Companies

According to Tohil (2009) the effective factors in the success of commercialization are having an innovation team, flexible team, having the proper interaction between the members and focus on the goal "being profitable in the commercialization". Also four key factors are important in commercialization of ideas such as: team working, planning, clarity and perseverance.
Giuri et al. (2008) finding the project leaders have an important role in arriving success. This research finds that project leaders possess diversified skills which are needed to provide participants, motivate contributors, and coordinate their efforts.
According to Löfsten and Lindelöf (2003) the self-financing is the dominant characteristic of funding in the small-firms sector. In terms of the Chou and Lee (2013) the main contribution is to identify the list of criteria and factors for assessing the commercialization opportunity for new technology product: market potential, customer needs, profitability, and market competition factors seem to have distinctively higher importance, indicating that they are the key factors for commercializing technology for new products. This result provides evidence that new technology-based product development should be targeted at the right market opportunity. Including Amir Ahmadi (1996) one of the successful development factors in the Parks exists a culture of innovation in the Park. Salami (2006) finds clear criteria, control of activities, the relationship between the parks and the University and the professional full-time management are as vital factors in parks. According to Koh et al. (2005) the main growth mechanisms are government-led infrastructure provision and be ever updating through the creation of new businesses.
How do we think the necessity of the commercialization of science and technology parks?
According to the patterns of development of 250 high technology firms in the San Francisco during 2 years showed that 36.8% of these firms had discontinued, 30.8%were surviving and independent and a remarkably high 32.4% had been acquired. This happened in between 4-7 years after the birth. The highest percentage of these companies in the commercialization level failed. Hence it is better to first turn on the concept of commercialization (Bruno and Cooper, 1982). Tabatabaeian (2007) "describes jolly's model" five of these constitute the key sub process involved in bringing new technologies to market:

1- Imagining a techno market insight
2- Incubating the technology to define its commercializability.
3- Demonstrating contextually in products and/or processes.

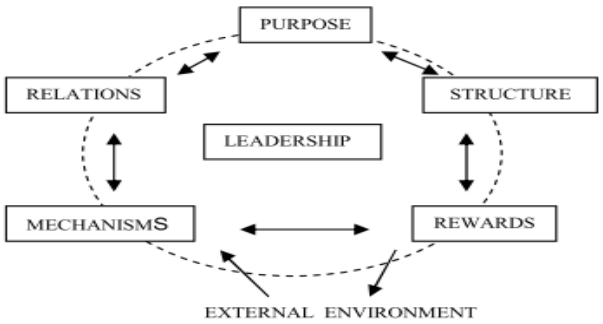
4-Promoting the latter's adoption
5- Sustaining commercialization

Fakour (2005) says the commercialization process includes components; the beginning is investment in research and development, practical implementation of research and development, the decision in intellectual asset management, making a prototype and finally the market leading to the successful introduction of a product or service. Azimi (2010) explores" The commercialization brings the idea to the market that is consuming money and taking long term and the output of that does have high incertitude". The average cost of product commercialization is 10 to 100 times more than the cost of the design and development (R&D) about new assistive and the possibility of success is very small too. The commercialization of university research takes over six years.
The incubators and parks play an important role in training and maintenance of newly established companies. But they don't enough support in commercialization fields. In this research, with a focus on one of science and technology parks in Iran and use the weisbords' diagnostic model. We want to evaluate effective organization factors in commercialization. Organizational diagnosis has two main purposes: one is the evaluation of organizational disfunctionalities and the other is the evaluation of the current state of the organization.

3. A DIAGNOSTIC MODEL: WEISBORD'S SIX BOX MODEL

We decided to concentrate our empirical study on the Weisbord's model because it is the most widely used model, especially in practice, but also in empirical studies mostly because its lack of complexity. This model was developed in 1976, by the American analyst Marvin Weisbord to assess the functioning of an organization. This model is based on six different variables (purpose, structure, relationships, leadership, rewards and mechanisms) which have a relation of interdependence; the central position of the model (Figure1) is occupied by the leadership variable. The goals of the organization are represented by their mission and objectives. Weisbord (1976) considers the structure as the way a firm is organized. The way people and units interact are called by the author "relationships". Also included in the category of relations is the way people interact with technology at work. The rewards, according to Weisbord, are those intrinsic and extrinsic rewards that people associate with their work. The variable leadership refers to the leadership tasks, including the balance between the other variables. The mechanisms refer to those procedures such as planning, control, information systems used to achieve organizational objectives. In Weisbord's model the external environment is present, but it is not considered a separate variable in organizational diagnosis. The variable leadership which purpose is to coordinate the remaining five variables occupies a central place in this model. For the purpose dimension, the two important elements are goal clarity (the extent to which organization members are clear about the organization's purpose and mission) and goal agreement (whether people support the organization's purpose) for the structural dimension, the primary question is whether there is an adequate fit between purpose and the internal structure that is supposed to serve that purpose. The relationship dimension investigates relation between individuals or departments that perform different tasks, and between people and the nature and requirements of their jobs. The reward dimension measures the employees' level of satisfaction with the rewards (the compensation package, incentive systems and the like) offered by the organization. The helpful mechanism dimension refers to all processes that every organization should attend in order to survive: planning, control, budgeting and other information systems that meet organizational objectives. Leadership, the core of this model, is essential for organizational success and is used to maintain and support other components in the model. According to internal variables of the Weisboards's model, some questions were prepared such as how is the organization is and how it should be . These questions were based on organizational development plan (Lok and Crawford, 1999; Gavrea, 2011).

Figure 1. Six Box Model



Source: Weisbord, 1976: 441

3.1. Case Study

A case study of this research is a successful science park in IRAN that chose by visiting the site and phone call to the owner of the Park and the familiar people with the incubators, parks and science town. Sheikh Bahaei Science & Technology Park was established in a 36.5 hectare land, located in the west of Isfahan University of Technology. The enough field work and the necessary infrastructures are preparing In Sheikh Bahaei Park; The Park supports the new companies' activities and their development and promoting. This Park absorbs new technologies. The Park attracts foreign investment and technical man, strengthening supportive structures for knowledge-based companies, establishing relations with other research, industrial and economic sectors, Cooperation for increasing the competition among companies in the national and international levels. Sheikh Bahaei science and technology parkland has capacity for 150 different companies. Science and Technology Park with the legal benefits of enjoying free zones have special facilities for the establishment of new born companies[3].

4. INSTRUMENT AND DATA COLLECTION

The organizational diagnosis instrument used in this study was preziosi's (1980). Organization Diagnostic Questionnaire (ODQ) is the extension of an earlier used by Weisbord (1976). Our instrument has 24 items measuring the six dimensions contained in the model. This questionnaire rated on a likret scale ranging from agreeing strongly (5) to disagree strongly (1). The questionnaire used in this study has included items to gather information from manager of technology parks and staff of the commercialization department of technology parks and manager of the new born company established in the Sheikh Bahaei park. All staff in the park was invited to participate in the questionnaire survey and was chosen companies that started the commercialization process in their company. In total 34 of 36 collected questionnaires were used.

5. RESULTS

Cronbach alphas implemented in the SPSS factor analysis procedure reliability estimate software and Cronbach alphas were calculated for each of the Weisbord' model's factors then the mean rating for each item were reported. Cronbach Alphas must be near to 1. ($0<r_{\alpha}<1$)

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Table 1. Cronbach Alph.

Factor	**Alpha**
Purpose	0.691
Structure	0.764
Relationships	0.753
Rewards	0.602
Mechanisms	0.768
Leadership	0.862

That shows the reliability of the questionnaire.
Table 2 shows the result of evaluation of organization factor in Sheikh Bahaei Technology park. Managers and Commercialization Department's Staff of park and Managers of established companies in park, expressed the opinion. Results show managers of established companies in park answered in low rate to all factors.

Table 2. The result of evaluation categorizes with the responsibility of attending

Factor	**Std. Deviation**	**SH.B.T.P. Manager**	**SH.B.T.P. Commercialization D. Staff**	**SH.B.T.p Manager of Established Co.**
Purpose	**N**	8	11	14
	Mean	0.92	0.78	0.73
	Std. Deviation	0.08	0.78	0.73
Structure	**N**	8	11	14
	Mean	0.74	0.67	0.6
	Std. Deviation	0.16	0.22	0.18
Relationships	**N**	8	11	14
	Mean	0.77	0.78	0.61
	Std. Deviation	0.15	0.15	0.17
Rewards	**N**	8	11	14
	Mean	0.84	0.7	0.59
	Std. Deviation	0.1	0.16	0.16
Mechanisms	**N**	8	11	14
	Mean	0.61	0.59	0.51
	Std. Deviation	0.14	0.59	0.51
Leadership	**N**	8	11	14
	Mean	0.83	0.84	0.67
	Std. Deviation	0.11	0.13	0.19

Radar diagram (figure2) shows the results of table 2. we can see Manager of park expressed the opinion in high rank each 3 factors (Purpose, Structure, Reward) more than another factor. For three factors; Mechanism, Relationship and Leadership, the answers of Park Managers was the same as Commercialization Department's staff.

Figure 2. Mean Dia.

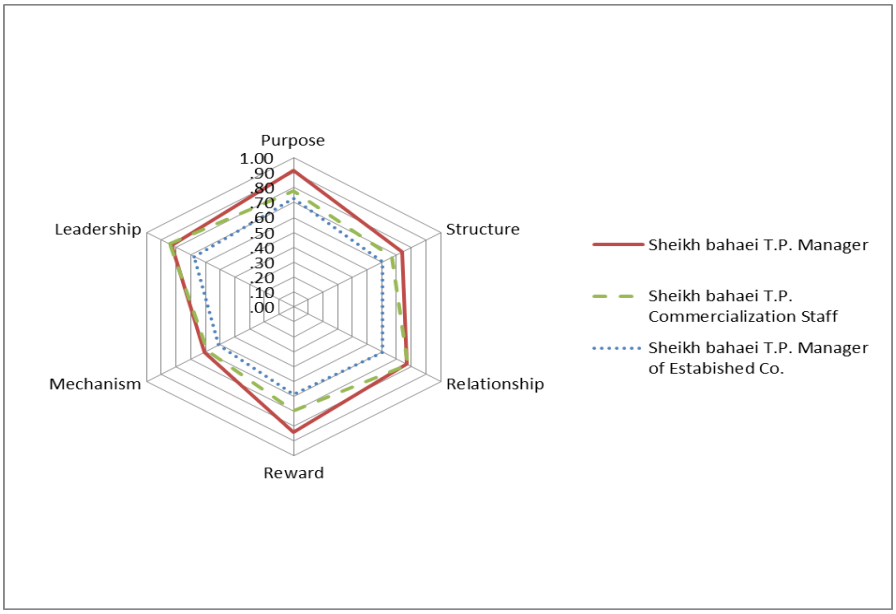


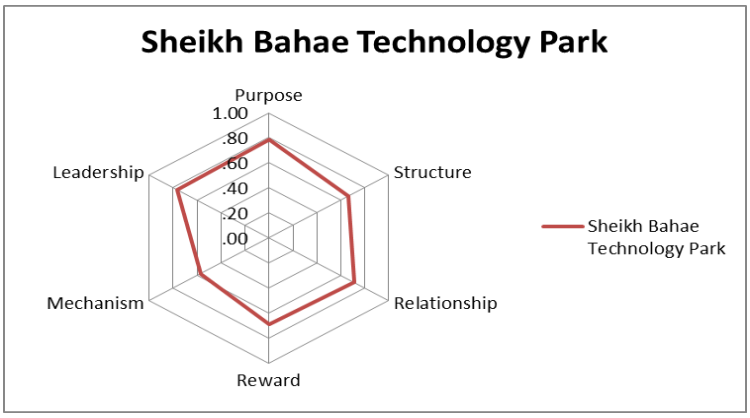
Table 3 show the ranking of weisbord 's model factors that we can see purpose is the first and Mechanism is the last factor.

Table 3. Ranking 6 factors

Factor	N	Mean	Std. Deviation	rank
Purpose	34	0.79	0.14	**1**
Structure	34	0.67	0.2	5
Relationships	34	0.71	0.18	3
Rewards	34	0.69	0.18	4
Mechanisms	34	0.57	0.2	**6**
Leadership	34	0.77	0.17	2

And we show the result of table 3 in the radar diagram (figure 3); the results are from 0.6 up to 0.8 and less than 1.

Figure 3. Mean Dia



The Organization's factors are categorized in table 4 .we can find that the Purpose and the Leadership are the top rankings.

Table 4. Categorise factors.

Factor	Std. Deviation	rank
Purpose	Unsuitable	0
	Acceptable	5
	Suitable	**29**
Structure	Unsuitable	4
	Acceptable	12
	Suitable	18
Relationships	Unsuitable	1
	Acceptable	13
	Suitable	20
Rewards	Unsuitable	1
	Acceptable	14
	Suitable	19
Mechanisms	Unsuitable	7
	Acceptable	14
	Suitable	13
Leadership	Unsuitable	2
	Acceptable	5
	Suitable	**27**

Unsuitable 0 till 0.33 acceptable 0.33 till 0.66 suitable 0.66 till 1

6. CONCLUSIONS

This paper using weisbords diagnostic model to evaluate organizations factors that affect commercialization in the Sheikh Bahaei Park. The model is based on six different variables; Purpose, Structure, Relationship, Leadership, Rewards and Mechanisms. The organizational diagnosis instrument used in this study was preziosi's (1980) ODQ which is the extension of an earlier used by Weisbord (1976). The questionnaire used in this study has included items to gather information from manager of technology parks and Commercialization Department's staff of Technology Park and manager of new born company establishes in the Sheikh Bahaei Park. All staff in the park was invited to participate in the questionnaire survey and companies that started commercialization process in their company, were chosen. The purpose and the leadership have the highest rankings between above six factors which denote to importance of

these factors in commercialization in the attendee's opinion. On the other hand the Mechanism factor has the lowest ranking which shows unclear effect on commercialization process. To upgrade the Mechanism in the commercialization process, it is better to make database and using IT and ICT systems and to facilitate sharing information network. Technical persons will be recruited for the commercialization department of the science park. Using the decentralized structure in the park, moreover the marketing and selling department and servicing department establish in the park. Reward and Motivation factor help to absorb venture capital and intelligently in the park. It will help more to dynamic and success of the park.

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ETHICAL CONSIDERATION

Authenticity of the texts, honesty and fidelity has been observed.

AUTHOR CONTRIBUTIONS

Planning and writing of the manuscript was done by the authors.

CONFLICT OF INTEREST

Author/s confirmed no conflict of interest.

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