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The Importance of Identifying and Evaluating Science and Technology Parks' Resident Companies in STPs Success and the Development of Companies

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STPs and AOIs: valorisation of investments

Authors:

Mohammad Jafar Sadigh Damghanizadeh (mjsadigh@ut.ac.ir)
Hossein Shabanali Fami (hfami@ut.ac.ir)
Amir Ziaei Mehrjerdi (ziaei@ut.ac.ir)
Amir Fatah Ziyaei (ziyaei@ut.ac.ir)
Solmaz Attar Ashrafi (solmaz.ashrafi@ut.ac.ir)

University of Tehran Science and Technology Park, Iran

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Mohammad Jafar Sadigh, Hossein Shabanali Fami
Amir Ziaei Mehrjerdi, Amir Fatah Ziyaei, Solmaz Attar Ashrafi

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Executive Summary

Science and Technology Parks are considered as important tools in order to develop entrepreneurship and technological innovations and also to accelerate the commercialization of technology and producing wealth from knowledge in developed or developing countries. The expansion of financial supports of Science and Technology Parks' resident companies by governments has been creating new challenges for STPs. The main challenge is the probability of increasing fictitious companies which are only established to attract government support and spend it on non-technological activities.

The problem will be more serious particularly in developing countries which have state economies and fictitious companies are not removing automatically. The lack of consistent and accurate evaluation system of STPs in these countries may increase the number of inactive companies and eventually leads to failure in achieving the Parks' goals and transforming them into a ghost town with just few active companies. The mentioned condition causes a waste in Parks' resources on the one hand, and in the other faces the technological synergistic space with serious hazard. Therefore University of Tehran Science and Technology Park has designed a new system for evaluation of resident companies relying on a decade of experience.

In this paper, first we will review the experience of some other STPs then as a case study the evaluation system, methodology, the method of calculating indicators and evaluating the companies based on indicators of University of Tehran STP will be studied. Also the main results and side achievements, such as providing annual activity report for companies and a detailed understanding of their products and services which can be an important factor for companies to plan their future development will be discussed and necessary suggestions will be provided. The mentioned evaluation system is predicted to conduct annually and in a way that can prevent the settlement of inactive and fictitious companies which are only create to attract state facilities and use them in no technological affairs.

The current evaluation system is retrieved from 10 years of pathology and experience of University of Tehran Science and Technology Park in the field of interactions and evaluation of the resident companies performance, and also identifying the most important and decisive key indicators in measuring the companies' success and offering them solutions. This evaluation system is consisted of the performance evaluation of companies in public and proprietary indicators. The most important public indicators are the level of activity and presence of the company shareholders in Park, their interaction with the Park headquarter and other resident companies. The most important proprietary indicators are the technology, human resource, and financial criteria which will be discussed in continue.

The company technology is calculated on the basis of indicators such as level of technology, method of access, the use of knowledge to create added value, the technical complexity and the innovation of individual products or services. The calculation method is based on evaluating the company technical documents, holding Q&A meetings, visiting the company product line by faculty members and experts as technical referees and their comments.

The financial criteria are calculated in the basis of total revenues and expenditures of the company, based on their official statements according to official declaration. It consequently leads to recognition of those who lack the financial transparency which leads to stop their activities and co operations in University of Tehran Science and Technology Park.

The company human resource is evaluated on the basis of educational degree, acquiring specialization and empowerment of the staff and the duration of their participation in the company based on the insurance lists or their cooperation contracts, holding Q&A meetings with key staff engaged in R&D sector. The result would be extraction the number of full-time personnel in the company, the percentage of knowledge workers, and the percentage of active personnel in the R&D sector. Finally a model and relating suggestions are proposed for ranking resident companies based on their functions. The mentioned model can be used as an appropriate tool and guide for managers of STPs to evaluate the performance of companies and also the mangers of companies to identify and improve their weaknesses and strengths.

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Introduction:

The rapid growth of technology and the increasing emergence of new technologies, have transformed the world economic fundamentals. So the role of knowledge in producing institutions become more and more prominent and dominant, and a production-based development model or the pattern of industrial development has been replaced by knowledge-based development model. Accordingly, large companies and industries are replaced by small and medium-scale industries or companies that their intellectual property has made a large part of their assets, conventional technologies are replaced by superior technologies, and government investments are replaced by venture capitals. The consequence of this paradigm shift is knowledge based economy which the largest and most modern economic studies are dedicated to. [1]

In the era of knowledge-based economy, Value-creating activities of organizations are not only on their tangible assets, but also knowledge and staffs' ability, appropriate relations with customers, and suppliers, quality of products and services, information technology and organizational culture that are much more valuable assets which R & D sector forms their central core. Comparison in the table (1) is a clear example to support this approach.

Table (1) - Comparison of Turkish Airlines and WhatsApp

Company	Turkish Airlines	Whatsapp
Founded in	1933	1999
No. of employees	23,160	55
Market cap	$4.3B	$19B
Assets	Planes	Servers
Function	Sends people	Sends messages

In new development model, knowledge-based SMEs have specific role in economic development of the countries. Two or three-digit growth, a multitude of innovative ideas developed by these companies, and their ultra-rapid mobility have made them the engine of economic development. Creating more than 65 percent of job opportunities in Europe, more than 80 percent in United States, creating 55 percent of innovations, and 5 percent of outstanding and very influential innovations by these companies indicate their effective role. And this is why the national and regional directors and officials pay special attention to science and technology parks as a platform to create, support, and develop knowledge-based companies, and empower them as the cells of sustainable development, and considering their role in the realization of the knowledge-based economy. [2]

Consequently, the expansion of government financial support of resident companies in science and technology parks face the STPs with new challenge and that is the possibility of increasing fictitious companies which are just established to attract government support and spend it on non-technological activities. The problem will be more serious particularly in developing countries which have state economies and fictitious companies are not removing automatically. The lack of consistent and accurate evaluation system of STPs in these countries may increase the number of inactive companies and eventually leads to failure in achieving the Parks' goals and transforming them into a ghost town with just few active companies. This fact indicates the necessity of STPs' consistent, accurate and clear assessment system for proper functioning in achieving their mission and goals.

Proper function of science and technology parks is far more important since, Launching and developing business, especially knowledge-based business, is very hard and difficult. According to the report of World Bank in 2016, Iran was rated 118 in The Ease of Doing Business in the world (Doing Business 2016). This rating means that the lack of constant,

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accurate, and consistent evaluation of resident companies in STPs can cause a serious disaster and led to dissolution of the many knowledge-based companies.[3]

It can be said that the main and the most important purposes of creating science and technology parks are supporting the formation, survival and development of knowledge-based companies and also commercializing their ideas and products, since maintaining and expanding the business, is the main core of any economic development plan. Maintaining and expanding the business plans prevent shifting businesses in various other places and help them to survive in upcoming economic problems and challenges, and assist them in expanding and increasing employment, and finally lead to increase their competitiveness in a larger business environment. (Baker2007)

Considering that one of the key indicators of measuring the success of science and technology parks is evaluating the status of knowledge-based companies' performance, therefore, the implementation of performance evaluation system for these companies is clearly essential. The purpose of this paper is the introduction of evaluation system of resident companies in STPs and its specific role in STPs and incubations success by case study (using the results of the evaluation system in University of Tehran Science and Technology Park).

In this paper, first the previous literature, experiences and researches on STPs evaluation and existing evaluation systems will be reviewed, then by introducing University of Tehran Science and Technology Park resident companies evaluation system, methodology, identifying factors, key indicators and evaluation process based on indicators and presenting results will be discussed (presenting results includes main results and their side achievements such as providing Annual Activity Report, and exact recognition of their products and services, which can be an important factor for companies to plan for their future development) . Finally the required suggestions and results will be offered.

This evaluation is done annually and is derived from more than a decade of UTSTP experience and pathology and also the pinions of the related experts. It is expected to stop inactive companies and can be used by the heads of STPs as an appropriate guide to make decisions and offer appropriate alternatives and also help to identify and improve weak-points and reinforce strong-points.

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2- Literature Review:

Prior to the introduction of resident companies' evaluation system in STPs and its specific role in improving the parks performance and success, initially in this part the related literature, researches, and previous papers will be reviewed:

2-1 What is Evaluation?

There are various definitions for evaluation and its concept which each of them has been defined and discussed it from a specific perspective. Among these various definitions we have selected the general definition of the evaluation concept from the STPs point of view.

General Definition of Evaluation: (Wikipedia**)**

Evaluation is a systematic determination of a subject's merit, worth and significance, using criteria governed by a set of standards. It can assist an organization, program, project or any other intervention or initiative to assess any aim, realizable concept/proposal, or any alternative, to help in decision-making; or to ascertain the degree of achievement or value in regard to the aim and objectives and results of any such action that has been completed.[1] The primary purpose of evaluation, in addition to gaining insight into prior or existing initiatives, is to enable reflection and assist in the identification of future change.[2]

Evaluation is often used to characterize and appraise subjects of interest in a wide range of human enterprises, including the arts, criminal justice, foundations, non-profit organizations, government, health care, and other human services. It is long term and done at the end of a period of time [4]

Specific Definition of Evaluation: (Europe Union report on the subject of setting up, managing and evaluating science and technology parks in 2013)

Evaluations explore the impact of an initiative on its local, regional or national economy. Evaluations revisit the reasons why the initiative was developed in the first instance and explore whether it had the desire effects.

Evaluations trend to ask two key questions: "what did you want to change?" and "how would you know if you have change it". "These evaluation questions are not just bureaucratic tools to follow up on these questions." [5]

2-2 Performance Evaluation:

In this part the preceding researches and articles on the subject of evaluation and its importance in the success of the organization, and exclusively the researches about the necessity and importance of evaluating the performance of science and technology parks will be discussed.

2-2-1 Performance evaluation of an organization and its importance:

As Neely states: "performance evaluation system is a set of parameters used to calculate the efficiency and effectiveness of past operations" and "This system helps to make smart decisions and carrying out fact based activities. Since the effectiveness and efficiency of the actions would be evaluated. This evaluation is done by collecting, comparing, classifying, analyzing and interpreting related data. [6]

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Performance evaluation of an organization leads to motivation of staffs, support decision-making process, improve organizational learning, continuous improvement and enhance communication and coordination. That's why this issue is increasingly considered in recent decades. [7,8]. Today providing services and producing numerous products, has created enough sensitivity to review the goals, improve beneficiaries satisfaction and organizational performance. Performance evaluation is a process during which the performance would be measured, evaluated, judged and valorized, in a certain period of time, and if the evaluation is done with process standpoint correctly and consistently, thereby the performance of organizations would be improved. [9]

High-performance is a goal that any organization follows. Logical and scientific evaluation methods not only can evaluate the past performance of the organization effectively, but also cause to make decisions which will improve and achieve a favorable position of performance in the future [10]. The performance evaluation of an organization leads to identify strengths and weaknesses and also find out which phenomenon is illogical and unreasonable. [11]

According to Guerra-Lopez (2007) some common reasons for performance evaluation are: evaluating the value and benefits resulting remedies the problem, getting feedback as part of a process of continuous monitoring, controlling the resources, and meet legal requirements and comply with the decisions which are taken recently. [12]

Decision-making is the most important concern of every manager in professional activities. According to many scientists in the field of management, decision-making is a criteria for evaluation of a manager, even some scientist like Herbert Simon has considered decision-making equal to management. [13] Managers require different information in their decisions, and one of the fundamentals which can help them is the performance evaluation. So if the evaluation is done scientifically, it can be used as an effective guide. [14]

Emphasizing on the concept of assessing and evaluating the performance can be observed from long ago, and with the development of the first human societies. Managers and owners provide resourced for organizational activities, and on the other hand institutional clients have their expectations and demands. An organization will be successful when it meets the demands of the beneficiaries and covers its goals by the correct utilization of resources.   That is why the primary mission of any performance evaluation system to measure the success of the organization in achieving its goals. [15]

Performance is one of the principal concepts in management. Since the majority of administrative tasks are based on this concept, so the achievement of any organization would depend on its conducted activities.   In fact, the performance covers all the organizational requirements for achieving the objectives. [16]

In order to understand any phenomenon it is necessary to define it in order to reach a common understanding, and the performance evaluation is not also an exception. Other definitions of performance evaluation are presented in the following:

According to Rafiei and Abbasabadi (2012), the performance evaluation is defined as a systematic description of the strengths and weaknesses of individuals or groups. [17] It determines the efficiency and productivity of the methods that are used to achieve goals as well as the indicators which are used to evaluate the efficiency and productivity of the companies' activities. [18] According to Zhang and Tan (2012) the performance evaluation is a systematic review process which

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assists organizations in achieving the targets set. [19] (In fact, performance evaluation improves the responsiveness and integrity procedures of the individual and organization objectives) [20]

2-2-2 Performance evaluation of STPs and their success factors

After more than half a century from establishing the first science and technology park in Stanford, several studies has been done especially in recent years, about the evaluation of the performance of STPs' and their factors of success. Among the published articles, here we will review the literatures in order to collect materials related to science and technology parks evaluation and success factors from the perspective of different authors. Research in this field can be divided into two categories. The first group is the subjects which have directly targeted the determination of vital success factors of parks, and the second are the researches which have noted the effective factors while discussed other related issues.

The first research which has examined and determined the vital factors of parks was the research of Mani that in the form of his doctoral thesis in department of executive management in University of Utah, has classified the vital success factors of Untied States STPs as follows: Logical relationship between park residents activities and programs of faculty members and university graduate students of the area can lead to a synergy which will increase the parks efficiency and on the other hand facilitate the flow of knowledge and technology between universities and companies in the park. Also the provided services by parks can attract important companies which their interactions with each other can facilitate the technical innovations, management policies such as meeting the physical lay out with the residents equipment development, or the controls and restrictions that must established to maintain the high quality of parks, finally the costs of residency should be less than the alternatives and also environmental factors such as residential area near the city, enough reasonably priced building, good public schools, appropriate colleges or universities in the area with identified research program, skilled technicians in the area, regional airport are vital factors for STPs from his viewpoint. [21]

In 1982 Levalle point out appropriate physical equipment, affordable incubator space, adequate financial resources, and good regional universities Technical faculty post graduate education in management as vital success factors for STPs.[22] During the same year Williams classified the effective factors to four groups of very important, important, relevant, and irrelevant. He, who had done his research about the UK's park, put convenient access to international airport, good roads network, and good residential and working environment in the first group, and placed access to market and capital markets, skilled workforce, supportive regional railroad and university in the second group [23].   Have access to convenient transportation facilities, and appropriate residential and working environment are considered as infrastructures which would increase the possibility of existence and development of resident companies.

MinShall in 1983, offered transparent criteria and official controlling of activities, strong ties to universities, and full-time professional management as vital success factors for STPs [24]. Two years later, Cox outlined pleasant working environment, a technical university and research equipment, and skilled workforce in the area as the key success factors of STPs [25]. In 1989 Carter in a research on UK technology parks considered proximity and connection to research institutions and universities, existence of qualified workforce in the area, access to markets, suppliers, professional services, suitable residential and a working environment and national and international network as vital success of parks [26]. In 1990, Hilbert introduced Entrepreneurial spirit, management skills, parks' residency policies, and political climate as success factors [26]. In his research he pointed out

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that the entrepreneurial spirit also makes the incubators activities more prosperous and the support of regional and national policymakers is a very important factor to offer better services.

lagrogoldstein in 1991 suggested R&D activities, high technologies in area, research centers, medical and technical faculties ion the area, access to airport and business infrastructures, as achievement factors. [26] In the research he bolded the role of regional R&D and high-tech activities in parks' success, since basically STPs are create to support and facilitate the development of tech-based companies and tech-startups and if there is not an enough capabilities in an area so principally establishing a STP in that area is not meaningful.

During 1992-1994, each of Lee and Felsen steins stated one factor as vital success factor. Lee believed to the access to the technology and information resource, and Felsen to proximity and relations with the universities. [26]

In an appropriate study on evaluating key factors in 1998, Kabral and Dehab, have performed a study on South Africa STPs. The research is suitable since unlike most of the studies it was not done in a developed country, and the evaluation vital factors are stated as follow:

1- Qualified R&D staff in knowledge area related to Park identity
2- Marketing skills for products and valuable services
3- The capability to offer marketing and management skills to companies
4- Considering the intellectual property of the services in the society
5- Homogeneity of the projects with the science identity of Park
6- Clear identity
7- A management team with financial skills and familiar to long-term economic development plan
8- Powerful economic actors, such as financial institutions, political institutions or local universities
9- Powerful individuals with long-term strategies and plans
10- Consulting and technical services companies like labs and quality control companies[28]

In 2001, Lindalof and lofsten in their study which aims to evaluate the success of the Swedish tech park, as well as providing criteria for evaluating tech parks, stated the relations with local universities, proximity to customers and suppliers, access to researchers and business specialists and communication between residents in the park as success factors [29]. In 2002, Backours in a research on the success of technology parks in Greece knew the formal or informal tie with universities, long-term interactions with other resident companies as the common characteristics of successful parks [30]. In 2003, Siegel and Westhead introduced management skills as success factor in their research on tech SMEs in UK STPs [31]. Ferguson and Olofsson in their research on SMEs pointed out to providing management and business trainings for residents as main factors [32]. Byung Joo Kung in 2004 offered two categories of success factors, while providing a model to develop different types of technology parks. There were two groups in the first category, hardware and software factors. Geographic factors, factors related to services and facilities, and support mechanism factors were identified to place in the second category [33]. And finally in 2005, he introduced the incubator space and proximity to suppliers, professionals and future potential partners as Critical Success Factors [34]. Lau Chan (2005), by using business development data of six

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Hong Kong STP Incubators presented a framework to evaluate the incubators effectiveness from the aspects of creating investment and development process. In this study, they concluded that in order to meet the needs of companies in their development stages incubators supports and services should be prioritized according to the development process of companies. Collecting data in this research was based on case study [35]. Bigliardi and colleagues (2006) have used Grounded Theory method to evaluate Italy science parks. Based on the analysis of four case studies in Italy, experimental findings support previous research outputs to some extent, and add new elements to the discussion. Real missions, commitment of major stakeholders, regional economic conditions, the nature of scientific merit of parks and parks' life cycle stages were considered as STPs evaluation criteria [36].

Sun (2009) in a study analyzed the efficiency and productivity of six industries development in Taiwan's science park during 2000-2006, and used Data Envelopment Analysis for this purpose. The results indicated that industrialists not only should improve their management skills but also enhance their innovation performance [37].

Lewis and Holod (2011) have presented the analytical framework to evaluate the development, sustainability, and strategies of Singapore Science Park. The framework covers three aspects of the development of science parks including development strategy, the level of technological capabilities and the nature of its integration with the national and international markets [38].

Moreover, the International Association of Science Parks (IASP) knows the executive communications with universities or other higher education institutes and research centers, a strong management team, and creating a platform for transferring technology and business skills to resident companies, as STPs success factors [39].

According European Union report entitled "SETTING UP, MANAGING, AND EVALUATING EU SCIENCE AND TECHNOLOGY PARKS" in 2013, has mentioned the following seven crucial factor in evaluating the performance of science and technology parks based on Theory of Change, which in Table 2, explanations and examples of each factor is expressed. Also as shown in figure 1, a method for STP evaluation cycle is offered which is based on five main stages [5].

1- Market failure
2- Baseline
3- Activities
4- Inputs
5- Outputs
6- Outcomes
7- Impacts

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Table 2: Theory of change underlying science park evaluations		
Issue	Explanation	Examples
Market failure and rationale	What is the problem the Initiative is trying to address	• Knowledge-based start-up companies face adverse conditions • There is no risk capital to be invested in innovative ideas • Knowledge-based employment is growing less rapidly than in competing locations • Innovation is inhibited because there is competing locations • Innovation is inhibited because there is insufficient awareness of the beneficial effects stemming from it • Knowledge base institutions are reluctant to work with third parties • IP is not commercialized.

Baseline	How can the problem be measured on the basis of verifiable indicators	• Knowledge economy performance worse than elsewhere
		• Measured for example by:
		  - Numbers of company start-ups
		  - Venture capital investments
		  - Patenting and licensing activities
		  - Employment in well paid high tech sector jobs

activities	How is the problem to be addressed-what exactly is to be done	• Undertake concept and feasibility study of new science park and implement it • Develop a placement scheme for university students • Stimulate small business development through an incubator
Input	What are the costs? What are the resources (money and in kind) to be devoted to addressing the problem	• Capital expenditure on a science park • Operational spending on the science park management team
Outputs	What will be the initial result	This list can be very long, reflecting the specific nature of the initiative. For example: • Site prepared • First building erected and occupied • Managing team employed • A range of animation measure undertaken • Specialist business advice provided
Outcomes	What are the long lasting effects	• Knowledge-based companies created and supported • Job opportunities in knowledge-based jobs created and supported • Innovation opportunities realized in companies
Impacts	How has the knowledge economy	• A richer and successful knowledge economy that can compete internationally

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5.Tracking impact assessment and learning

Contextual conditions and problems in relevant domain
An analysis of the problems the intervention seeks to
solve

impacts

Aims and objectives of the interventions
The intended purpose over the life of the
interventions

**1.Strategy
and
program
appraisal**

**Theory of
change**
Why and how
will the
interventions
Address the
market
failures and
other
problems?
Assumptions
What factors
must exist for
success?

Inputs
Resources
people, time,
materials,
funds
dedicated to
the design
and delivery
of the
interventions

**Activities &
Processes**
The support
And Services
provided By
Partners
jointly or
severally to
deliver the
interventions

Gross outputs
Direct effects
from the
interventions
that can be
targeted and
monitored
Net Outputs
Adjusted for
deadweight,
Displacement
and
multipliers

Outcomes
Changes induced
By the
Interventions in
The behavior,
Performance and
Well-being of the
People,
Communities,
Businesses and
Organizations
Associated with
The intervention
Directly and
Indirectly

4.
Evaluation

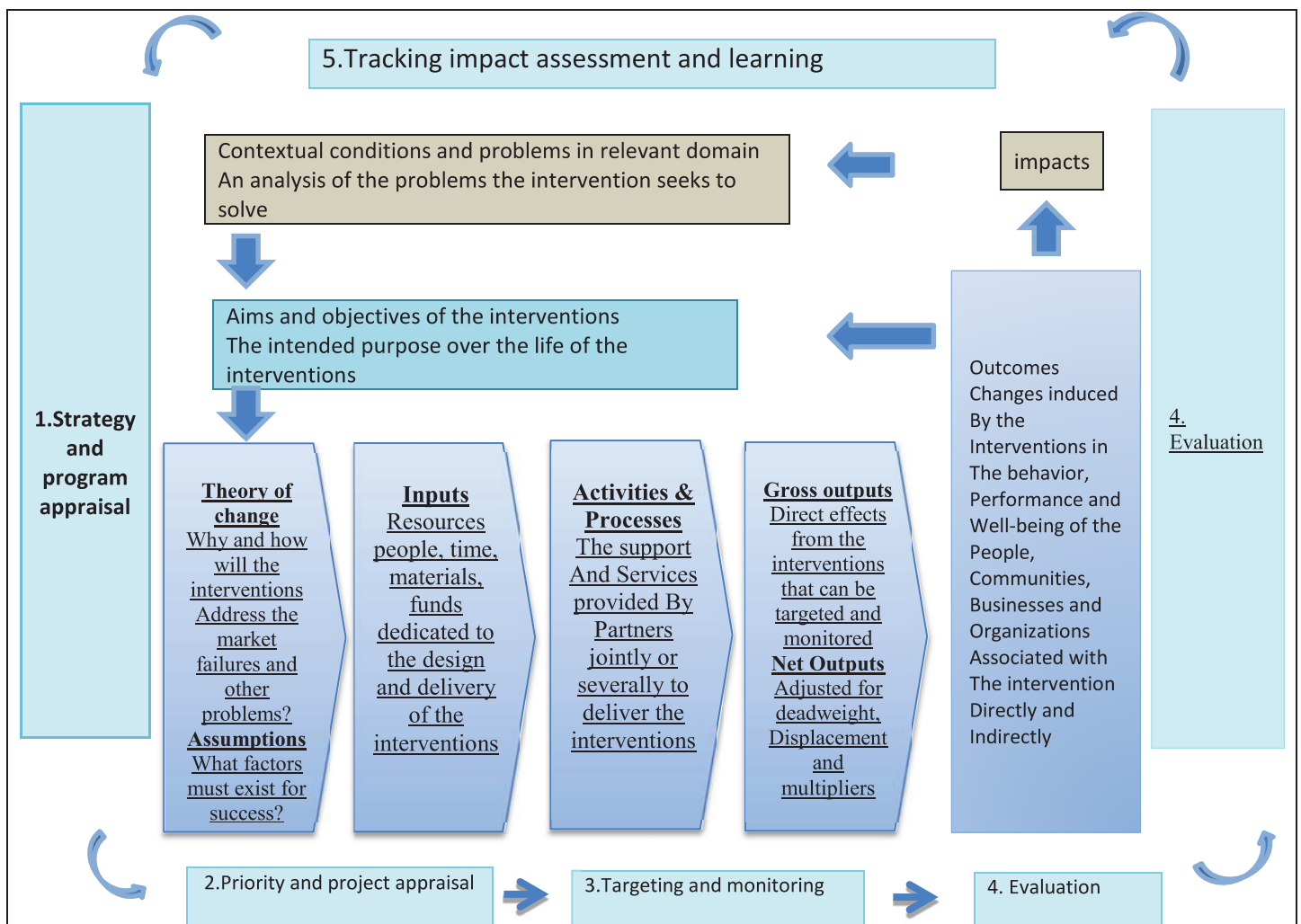2.Priority and project appraisal   3.Targeting and monitoring   4. Evaluation

Figure 1 : The evaluation Cycle

3-2 Systems of Evaluation and Admission of Companies in STPs

Most researches which were conducted on performance evaluation of STPs offered a framework for
evaluation, did not evaluate the resident companies particularly. Here the researches and studies
about evaluation systems and companies admissions in STPs and needed key indicators will be
reviewed.

Rustam Lalkaka (2001), in 35 countries on 150 projects related to launching, operating, and
evaluating STPs showed that they can be important components to promote the national
entrepreneurship program. But they require initial public support, community satisfaction on the
targets, strong tech entrepreneur leadership, realistic expectations with tough follow-up and
evaluation. Based on the issue, some basic criteria for incubators are formed not only for survival
but also to develop themselves and their resident companies. In this regard, ten subjects has been
introduced to support knowledge-based companies in science and technology parks has been
introduced, in among evaluating the performance and help resident companies to improve their
weaknesses and reinforcing their strengths is defined as one of the most important criteria which
again pay attention to the necessity and importance of performance evaluation system.

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An article entitled "STPs and Incubation Performance Evaluation through Technology Level Index" was conducted by Ghasem Moslehi and colleagues (2007), in which introduces a new method to evaluate the performance of companies in an incubation stage according to the index of technology promotion. In this method, incubator performance evaluation is done by indicators is an efficient way to calculate the performance [40].

In another study by Hamid Mahdavi and colleagues in 2011, titled "Analysis of the science and technology parks effectiveness by the results of resident companies' evaluation process", a model from the standpoint of management responsibility was considered with four main aspects to evaluate research and technology management performance. The aspects are: technology achievement, economic activities based on technology and commercialization of research achievements, planning and management with a view to monetization from research and technology activities, interactions and communications with parks and knowledge-based companies [41].

Mirfakhredini and colleagues (2012) in a study with resident companies' performance monitoring framework with DEALGP combined approach introduced total assets, expenses for R & D, number of employees, number of patents, annual sales, sales revenue, exports, the initial investment, operating costs and the amount of contracts, as ten effective indicators in resident or applicant companies' performance [42].

Finally, Ed.Kenguy and colleagues in the "Science Park Evaluation Handbook" knows the consistent, accurate and transparent system of companies' evaluation and admission mandatory, as one of the most important measures in evaluating the performance of science and technology parks. He knows the following six factors as main components of tenant evaluation and selection system and is explained according to Figure2 [43].

1. Tenant Inflow Creation

2. Screening Criteria

3. Evaluation and Selection Criteria

4. Decision making Methods

5. Organization of the Tenant Evaluation and Selection Process

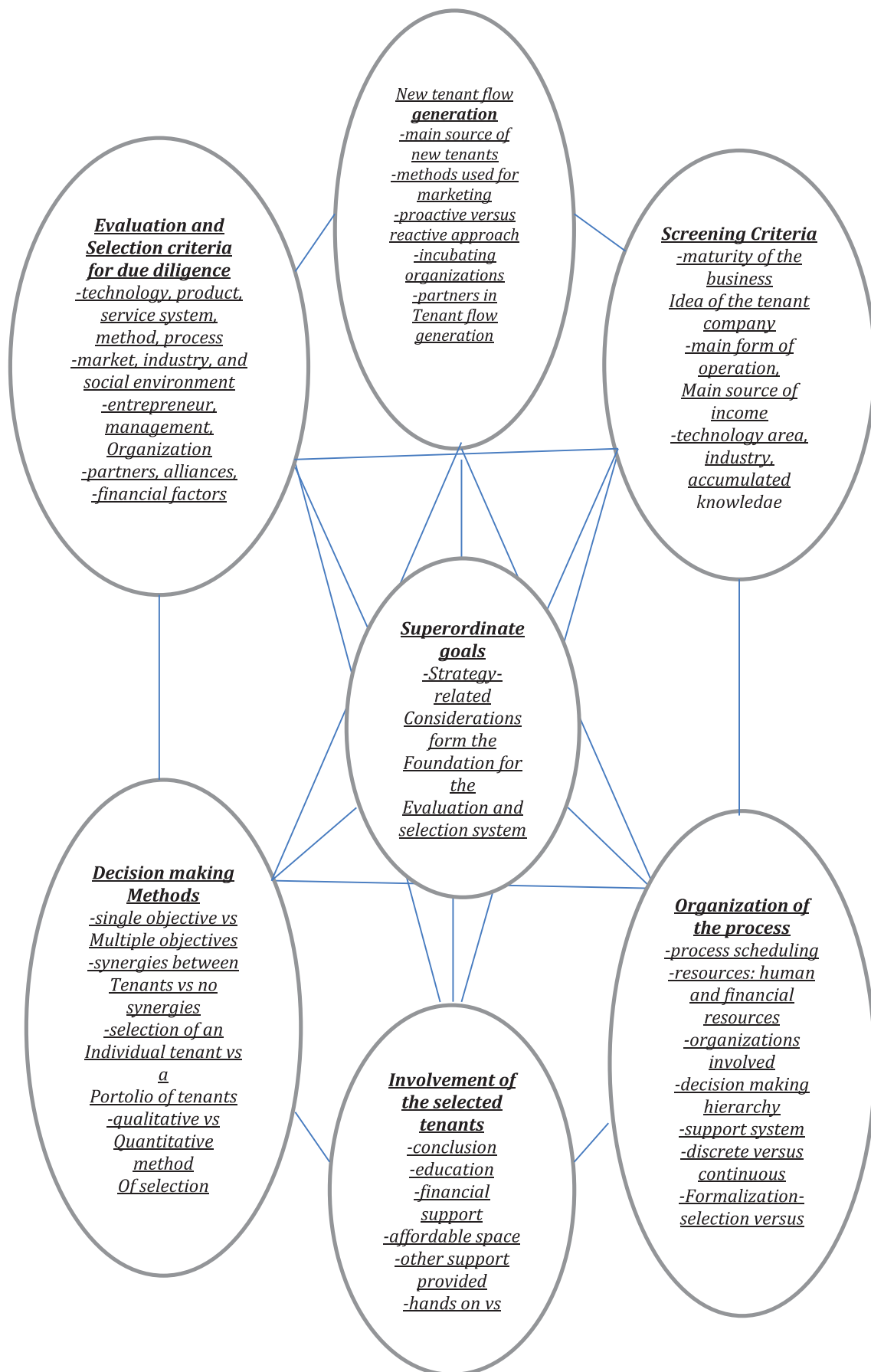6. Involvement in the Businesses of Tenants after Selection

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New tenant flow generation
-main source of new tenants
-methods used for marketing
-proactive versus reactive approach
-incubating organizations
-partners in Tenant flow generation

Evaluation and Selection criteria for due diligence
-technology, product, service system, method, process
-market, industry, and social environment
-entrepreneur, management, Organization
-partners, alliances,
-financial factors

Screening Criteria
-maturity of the business
Idea of the tenant company
-main form of operation,
Main source of income
-technology area, industry, accumulated knowledae

Superordinate goals
-Strategy-related Considerations form the Foundation for the Evaluation and selection system

Decision making Methods
-single objective vs Multiple objectives
-synergies between Tenants vs no synergies
-selection of an Individual tenant vs a Portolio of tenants
-qualitative vs Quantitative method Of selection

Involvement of the selected tenants
-conclusion
-education
-financial support
-affordable space
-other support provided
-hands on vs

Organization of the process
-process scheduling
-resources: human and financial resources
-organizations involved
-decision making hierarchy
-support system
-discrete versus continuous
-Formalization-selection versus

Figure 2: Main Components of Tenant Evaluation and Selection System

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3. Introduction of admission and evaluation system of University of Tehran Science and Technology Park, and Methodology

Extensive and comprehensive researches have been done regarding the criteria and indicators of knowledge-based companies' performance evaluation in science and technology parks. Most of the proposed methods are based on scientific management principles and theoretical and mathematical complicated calculations, which cause the systems cannot actually be practical to be used in parks and incubators. Hence the need to introduce an evaluation system that, despite the simplicity, could be practical and evaluate the STPs and incubators' resident companies' performance by indicators and simple methods is strongly felt.

Although our presenting evaluation system has benefited the general global but it has not been directly adapted from any existed pattern and has evolved gradually on the basis of local facts and circumstances in more than a decade of experience, and its originality is resulted by its aboriginality.

In this part we briefly present University of Tehran Science and Technology Park and its latest status, and then by setting the targets of evaluation system, the process, indicators and methodology and the method of calculating, the way of ranking companies and finally providing general and specific results will be discussed.

3.1 Introducing University of Tehran Science and Technology Park

The idea of establishing University of Tehran Science and Technology Park was proposed in 2001. The incubator has started its operation in 2002, and the entrepreneurship center was joined by the board of directors' approval. The principal agreement of establishment was issued by the Ministry of Science, Research and Technology in 2005 and UTSTP has started the operation with incubator, Entrepreneurship, and Future studies centers. As a University STP, the Park missions and programs were reviewed towards the goal of Entrepreneur University in 2014.

Planning and supporting the process of creating and developing University of Tehran spin offs, and also Playing the role of the gateway for industry towards the university are considered as the main missions. All scientific interests in University of Tehran are included UTSTP technology fields, and clusters are formed to increase working opportunities, and exchange knowledge which leads to the synergy between companies, increasing the professional level, and strengthening social relations. The existing clusters are divided as follows:

- Geosciences, and petroleum industries
- Information technology, and Communication Sciences
- Biotechnology, and Biomedical Engineering
- Mechanic, Optic, Electronic, and Mechatronics
- Civil Engineering, and Building Science and Technology
- Nanotechnology, and Advanced Materials
- Energy, and Environment
- Agricultural Sciences, and Natural Resources
- Food, and Pharmaceutical Industries
- Aerospace

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UTSTP in 2015:

The number of resident companies is also divided by their level of maturity as follows:

Table (3): The number of resident companies

Pre-Incubation	Incubation	Post Incubation	Anchor Companies
85	43	77	3

472 products/services have come to fruition by the resident companies and their turnover was 185 Million USD.
1184 employees are engaged in the companies which 75% were knowledge workers.

3.2 The Evaluation System Targets
The present evaluation system is done annually and is designed in a way that it can pursue the following objectives:

1. Estimating the outcomes and results of previous investments on resident companies and help to determining the valorization of Park.
2. Help to convince partners and other investors, to attract investments and providing required resources.
3. Access to reliable information of companies in a way that have the needed accuracy for analysis.
4. Evaluating the company's performance in line with the Park objectives and missions.
5. Proper control and monitoring on the activities of the companies.
6. Appropriate tool to assist managers in identifying successful and unsuccessful companies and make required decisions (preventing the admission or continuing the activities of the companies, etc.)
7. Identifying the companies' strengths and weaknesses, empower them and pave their way by eliminating obstacles
8. Identifying inactive and fictitious companies with non-transparent operations and prevent admission or residency.
9. Appropriate tool to assist managers in identifying the final status and obtaining strategic decisions based on the overall results. (Companies average index of technology, total turnover of all companies, total employment created by the company, etc.)
10. Motivating companies for more activity and enjoying more facilities and services of Park.
11. Identifying top companies in each field of technology
12. Determine the admission / continuation of the companies residency
13. improvement of Park's supportive policies and programs

The results of evaluation can be used in other cases such as tax breaks, determining the level of Park's supports, transitional contracts, guarantee companies' contracts, and selecting the space, which of course each of the conditions requires a full definition.

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3.3 The Evaluation Process

In general, the success of STPs is depending on the use of convenient tool for accurate recognition of companies activities. The best tool to realize this important, is the implementation of assessment process. The evaluation is performed annually by seven main steps as follows:

1- Informing evaluation period to companies and sending worksheets
2- The completion and submission of forms by companies with the necessary documentation
3- The primary review of submitted form and documents, and completion of defects by evaluation experts if required.
4- Selecting technical and business referees, considering companies field of activity.
5- Holding technical and business consultations sessions and Q & A with the company representative and technical and business referees.
6- Preparing results and providing evaluation report on the basis of acquired points by the company.
7- Providing final report to park management team, for more information and take the necessary decisions as needed.

From the companies' point of view, evaluation process is not just a bureaucratic cycle. Working interactions, several sessions and holding technical and business consultation meetings by experts provides the opportunity that evaluation process acts like training courses. Qualified rreferees, experienced consultants and their knowledge and information create a trust that even the companies which do not receive the permit of admission or continuation of settlement practically gain trainings and experiences and based on the questions and consultations they will be guided in their ways.

Implementation Process

Phase I: Collecting Data

In phase one the required data about company would be collected, based on evaluation indicators. There are two ways for collecting data: self-report method, in which the companies would complete the relevant worksheets and submit them with related documents to admission and evaluation office. The other way to collect data about general indicators and verification of the items which are declared by self-reporting are the meetings with companies' officials during evaluation period through companies monitoring system, which is done monthly by supervisors and experts of incubator and development center, and the results will report to the admission and evaluation office in order to inform and compliance with company's self-report information and other issues.

Phase II: Analysis of Data, Index Calculation and Scoring

In phase 2, the collected data of phase 1, would be categorized, reviewed and scored by evaluation office experts and business and technical referees in question and answer sessions.

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Phase III: Analysis the Scores and Preparing the evaluation results

In phase 3, the report of results would be prepared and presented to companies considering the scores of each indicator based on phase 2.

The admission process, during the whole process, is training and corrective not selective and competitive. Cohesion, realism, comprehensive approach, uniformity and stability are considered during the process of evaluation and two professional referees, one familiar with technology (Science) and one with business, are present to measure the technical capability and the appropriateness of the company's business.

3.4 The Evaluation Indicators and their Calculation Methodology

One important tool to achieve the goal in STPs is the efficiency in evaluating resident companies' capabilities. The ability and capability of a knowledge-based company, is a function of quantitative and qualitative variables that number of indicators should defined to evaluate and analyze the performance, since awareness of the condition and performance of an organization and become familiar with the process requires consistent information of organization functioning in the form of indicators. Indicators are summaries of the system characteristics, its occurred events occurred and the results in short and simple messages for policy-makers, decision-makers and public, they are considered as a strong linkage between these two groups of society. Indicators makes complex and multi-dimensional issues simple in order to be used by policy-makers, decision-makers and the general public. They are useful instruments to evaluate the performance of the decisions which have been made and performed actions by providing and displaying the details of the progress towards the goals. Usually the main purpose of compiling the indicators is ranking a series of evaluation references compared to a feature. The increase of interest in using the indicators is related to the complicity of policy issues and the large amounts of data.

Briefly, correct formulation of the indicators from within the system aspect, contains information on past performance, the Reforms process, recoveries and tools to evaluate and measure progress over the time and predict the future state of the system in detail. The other usage of indicators is considering the system from the outside. Formulating the indicators from the outside of the system aspect, is a tool to evaluate the states of a system in a region, comparing them with each other, and ranking. [44]

Reducing the volume of data, facilitating the communication and increasing the responsiveness ability are the characteristics of the indicators. The important factor about composite indicators is their correct formulation. Since the lack of expertise and sufficient experience of the planning stages can lead to formulate them with incomplete and misleading information. Determining the type of indicators also should be stated. Usually the key indicators are more interesting for directors, in order to be familiar with the organization trend. Performance key indicators are almost result oriented while some others are process oriented. Also it should be considered that some indicators are retrospect and often interpret events, while some by looking at future used to forecast its future.

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3.4.1 General Indicators

General indicators are factors which can be extracted regarding the official reports and documents provided monthly by different headquarters of park based on general evaluation through resident companies' monitoring system. The factors are as follows:

1. The compliance with laws and regulations of the park

2. The presence and activities of their stakeholders and staff in their office in park

3. Interaction with the park headquarters

4. Creating synergy and interaction with other resident companies

5. Providing correct information and transparency in their activities

6. Professional ethics adherence

Although general indicators and interactions are not directly affected the success of a business, but obviously appropriate interactions with park and other resident companies can increase the probability of company's success.

3.4.2 Human Resource Indicator

One of the key factors that will be emphasized and in terms of quantitative and qualitative is considered in evaluations and scoring, is the team work and capabilities of the human resources of the company.

The number of full-time personnel, the number of insured staff, the percentage of knowledge worker staff (with the bachelor degree and above), the percentage of R & D personnel and the human resource score, are the factors which are considered on the basis of company's self-report and also studying the documents, comparing with insurance list, interview and Q & A with members of the company and finally visit the company's product line. The factors are calculated by Evaluation office experts according to figure3 formula.

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Company's Human Resource Information Table					
Row (k)	Full Name	Type of Activity (Based on major activities on working hours)	Number Of Insurance Months	Person working hours	Latest Degree
1		Design, research, develop and experiment prototype, testing and quality control	a	b	d

Number of human resource (full time) $N = \sum_{k=1}^{n} a /12$ or $\sum_{k=1}^{n} b /2000$ $\qquad$ B = a/12 or b/2000

Human resource normal score $X = \sum_{k=1}^{n} (B * D) / 2.5$ $\qquad$ If d = PhD => D = 3.2

R&D human resource indicator $Y =($ Full-time equivalent R & D personnel)/N $\qquad$ If d = MS => D = 3

Academic rank indicator $Z =$ (full-time equivalent bachelor personnel and higher degrees) /N $\qquad$ If d = BS => D = 2.7

$\qquad$ If d = PB => D = 2

$\qquad$ If d < PB => D = 1

*PhD=doctoral, MS = master degree, BS=Bachelor, PB=Associate's degree

Figure 3: Method of Calculating Indicators Related to Human Resources

3.4.3 Technology indicator

Undoubtedly, it can be stated that since one of the most important missions of STPs is supporting tech-based businesses, so an indicator that can evaluate the technological abilities and capacities of companies is definitely needed. During the process of evaluating, each of the products/services would be technically studied by a relevant technical referee according to self-report forms and related financial and technical documents during consulting, technical and Q & A sessions. Based on referees viewpoints and formulas mentioned in 4 and 5 figures, the products/services would be evaluated by evaluation office experts.

Regarding the important role of technical referee in determining company's technology indicator, selecting referees with high competence and expertise in a relevant technology field is very essential. Regarding this important, University of Tehran STP, with access to networks of expertise and technical referees at University of Tehran as the country's top university with more than 2100 top level faculty member, try the best to select the most capable and expert referees.

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Company's Product/Service Information Table				
Row (k)	Product / Service (Mentioned All Products/ Services at least at the laboratory samples level)	Number or version name	Date of publication / entering the market	Amount of sales in the year of evaluation
1	P/S			d

$B = b1*b2*b3*b4$: The level of knowledge on
(the level of technology, technical complexity,
share of knowledge from added value
and the rate innovation)

If P/S is Hi-Tec/Medium Hi-Tec/Medium/Low => b_1 = (0-1)
If P/S have Technical Complexity => b_2 = (0-1)
If P/S have Innovation => $b3$ = (0-1)
b_4 = Knowledge Contribution from the added value

$C = c1*c2*c3*c4$: The means of achieving

If P/S is made by R&D => $c1$ = 1
If P/S is made by Reverse Engineering => $c2$ = 0.9
If P/S is made by Technology Transfer => $c3$ = 0.8
If P/S is made by none of the above (Assembling, Copying …) => $c4$ = 0.2

Technology indicators of product / service (0-1): $P_k = B*C$

Company's technology indicator= $\left(\sum_{k=1}^{n} P_k * d_k \right) \; / \; \sum_{k=1}^{n} d_k$

A technology indicator of each individual product/service is calculated according to the above formula and each product technology indicator is multiplied in its sales amount. The sum of multiplication is summed together and the result is divided by the total amount of product / services sales. The final number represents the Technology indicators of the company.

Figure 4: Method of calculating company's technology indicator

Product Technology Indicator								
(b3) Innovation Rate		(c) Means of Achieving		(b4) share of knowledge		(b2) technical complexity		(b1) Level of Technology

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Innovation Rate					Means of Achieving				share of knowledge from added value			technical complexity			Level of Technology			
Lack Of innovation	Major changes in existing product	New at Company Level	New At National level	New at inter-National level	import	Technology transfer	Reverse Engineering	R&D	low	average	high	low	average	high	Low	Medium/Low	Medium/High	High-Tech
0.5	0.7	1	1.1	1.2	0.2	0.8	0.9	1	0.5	0.7	1	0.5	0.7	1	0.2	0.7	1	1.2

Service Technology Indicator																		
(b3) Innovation Rate					(c) Means of Achieving				(b4) share of knowledge from added value			(b2) technical complexity			(b1) Level of Technology			
Lack of innovation	Major changes in existing products	New at Company Level	New At National level	New at inter-National level	import	Technology transfer	Reverse Engineering	R&D	low	average	high	low	average	high	Low	Medium/Low	Medium/High	High-Tech
0.5	0.7	1	1.1	1.2	0.2	0.8	0.9	1	0.5	0.7	1	0.5	0.7	1	0.2	0.7	1	1.2

Figure5: Method of calculating product/service technology indicator

Definitions and explanations related to technology indicator

a. Level of Technology:

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Note: according to the OECD, classifications of industries in terms of the level of technology are as follows:

- High technology Industries: Such as biotechnology, materials, ICT, nanotechnology, renewable energy / renewable recycling, Social Network, semantics, aerial and space vehicle, pharmaceuticals, office machinery, computing, radio, television and communication equipment and medical and optical instruments and measurement instrumentation engineering.

- Medium to high technology industries: such as electrical devices and machinery, motor vehicles, chemicals excluding pharmaceuticals, transport and railway equipment, devices and machines

- Medium to low technology industries: such as construction and repair of ships and boats, rubber and plastic products, coke, refined petroleum products and nuclear fuel, other non-metallic mineral products, basic metals and fabricated metal products

- Low technology industries: such as manufacturing and recycling, wood industries, pulp, paper and paper products, printing and publishing, food, beverages and tobacco, textiles, textile products, leather and footwear

b. Technical Complexity:

Note: based on Oslo Manual the definition and examples of technical complexity include the following:

- High technical complexity: a system consisting of components, large parts and parts that are usually different technology fields such as aircraft, satellites, weather

- Medium technical complexity: a unit consists of small parts such as laser printers, textile machines

- Low technical complexity: a component or piece such as bicycle brake

c. Share of knowledge from added value

- High: The share of knowledge from the total added value in higher than 60 percent.

- Medium: The share of knowledge from the total added value is between 20-60 percent.

- The share of total added value is less than 20 percent.

d. The means of achieving:

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- Internal research and development: The product is obtained based on the company's internal efforts and activities in sectors like laboratories, R & D, new product development, necessary capability for designing, modeling, prototyping, examining, testing, manufacturing, and so on..

- Reverse engineering: The product is obtained according to various experiments and tests on components and one or more product samples from outside the company, enough capability for designing, modeling, prototyping, examining, testing, and manufacturing.

- Technology transfer: The product is obtained with technical assistance, transfer of documents and technical plans, transport equipment, participate in training sessions for designing, modeling, prototyping, examining, testing, and manufacturing.

- Import: Most of the parts and components are imported, therefore there is not enough capability for designing, modeling, prototyping, examining, testing, and manufacturing the product.

e. The status of innovation:

- New at the international level: it is the first product to be released worldwide.

- New at the national level: The product is presented for the first time in Iran.

- New at the Company: The product is offered by the company for the first time.

- Innovation in existing products: The product is the upgraded and developed model of the former products.

- Lack of innovation: The product was previously produced at the company and lacks innovation.

3.4.4 Financial Indicator:

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Another key factor which can be helpful and should be considered in some decisions, such as how to provide services and facilities for companies and suchlike, is identifying the company's financial capability. Total assets, total cost, total income and the company's turnover are important and decisive factors, which based on tax returns, are calculated in financial indicator, according to Tables 4 and 5 and below methods. (All the factors related to financial indicator are extracted from tax returns by the evaluation office experts and would be confirmed by financial evaluation expert.)

- Company's assets: It' extracted pursuant to the Total Assets article in balance sheet of tax return.

Table (4): The method of calculating the total income according to tax returns

Row number of tax return income table	Row Issue
1	Net sales
4	Gross income of contracting / providing services
19	Net other income and operating expenses
31	Net other income and non-operational
The total company's revenue is calculated by the sum of top rows	

Table (5): The method of calculating the total cost according to tax returns

Row number of tax return income table	Row Issue
2	The original cost of sold product
5	The original cost of contracting / providing services
15	Total selling, general and administrative costs
32	Financial costs
The total company's cost is calculated by the sum of top rows	

- Turnover: It is extracted from total revenue and total cost with their calculation method was explained in Tables 4 and 5.
- Financial growth percentage: It is calculated by the proportion of current year total income increase to the company's last year total income, according to the following formula

Company's financial growth percentage= [(current year total income - last year total income)/ (last year total income)] ×100

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During the evaluation process sometimes it's observed that some companies do not mention their financial activities completely in tax returns, in order to tax evasion and not paying the income tax to the government. In this case the company will receive very low and weak points in financial indicator, according to the present evaluation methodology, and practically has been deprived from many credit facilities of Park and will be forced to mention all the financial activities in the next evaluation period, to receive higher points. Actually, according to calculating financial indicator a side effect of the present evaluation methodology is the financial transparency in companies.

The factors of evaluation indicators and their extraction and confirmation process

All the factors of evaluation indicators and their extraction and confirmation process are specified in table-6.

Table (6): The factors of evaluation indicators and their extraction and confirmation process

Indicator	Factors	Method of Extraction	Confirmation by
Human Resource	Number of full time human resource	Human resource self-report Insurance list Personnel & advisors contracts Educational degree	Evaluation Expert
	Normal human resource point		
	Academic degree (full time)		
	Full time R&D human resource		
Financial	company's assets	Official tax return	Evaluation & Financial Expert
	Company's turn over		
	Financial growth		
Technology	Product/service technology	Products/services self-report forms With all the related technical and financial documents	Technical Referee

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3.5 Methods of Classification and ranking based on the evaluation indicators

The other main operational mission of evaluation is identifying the ranking and classification of each company according to its performance. After completing the evaluation process the point in each indicator would be calculated and regarding the maturity level of the company (incubation/post incubation) would place in one of the A, B, or C level.

Table (7): Method of Classification (based on the points obtained by each company)

Indicator	Row	Maturity Level	Status	Level
Financial	1	Post Incubation	Turnover more than 20 billion rials	A
	2	Post Incubation	Turnover between 4000 million to 20 billion rials	B
	3	Post Incubation	Turnover less than 4000 million rials	C
	4	Incubation	Turnover more than 2000 million rials	A
	5	Incubation	Turnover between 1000 and 2000 million rials	B
	6	Incubation	Turnover less than 1000 million rials	C
Human Resource	7	Post Incubation	Human resource points more or equal to 30	A
	8	Post Incubation	Human resource points between 30 to 7	B
	9	Post Incubation	Human resource points less than 7	C
	10	Incubation	Human resource points more or equal to 6	A
	11	Incubation	Human resource points between 6 to 4	B
	12	Incubation	Human resource points less than 4	C
Technology	13	Post Incubation	More or equal to 80%	A
	14	Post Incubation	Between 40% to 80%	B
	15	Post Incubation	Less than 40%	C
	16	Incubation	More or equal to 80%	A
	17	Incubation	Between 40% to 80%	B
	18	Incubation	Less than 40%	C

1 US Dollar = 3,033 Iranian Rial

Finally, the companies will be ranked based on points and achieved grades. For instance those who achieved "A" level in three indicators would be AAA and hold the first grade, the company which achieved A level in two indicators and B level in the other would be AAB that hold the second grade, and so on, all companies status and rank would be determined.

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3.6 Results (Case study of University of Tehran STP)

 In this section, the outcomes and results of the evaluation of resident companies in University of Tehran Science and technology Park will be reviewed in the overall and detail scale (specific of each company).

3.6.1 General results

 By completing the evaluation process and calculating companies' points in three indicators, an overall outcome of all companies' status is acquired. These general results are an appropriate tool for directors, policy makers and decision makers in the Park to identify the status of resident companies and play an important role in making their future policies and decisions.
 Regarding to the evaluation results some factors like resident companies total turnover, sum of total and tech-based income, total full time human resource, total knowledge workers and R&D personnel, and finally resident companies technology indicator average could be calculated as general or divided by their maturity level including incubation or post-incubation. In figure 6-9 the sample of general results obtained from UTSTP residents evaluation in 2015.is mentioned.

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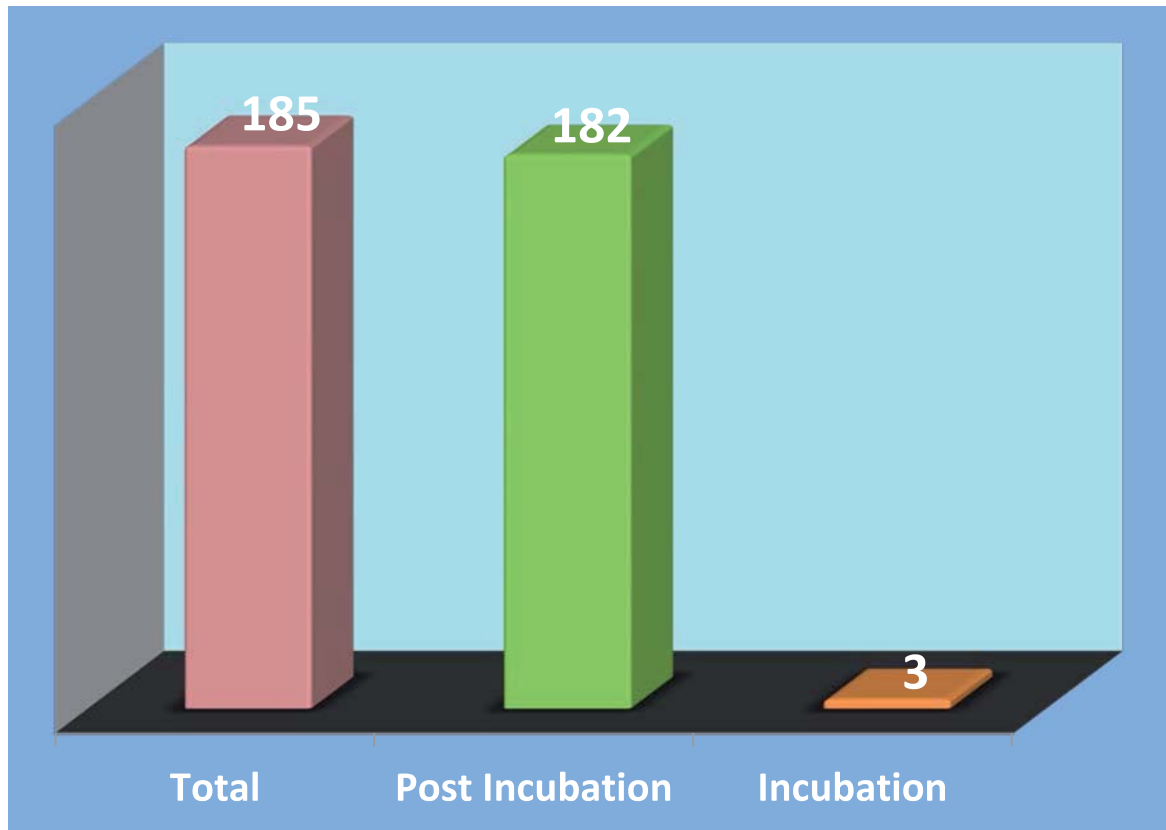Solmaz Attar Ashrafi

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Figure (6): Resident Companies turnover in Million USD
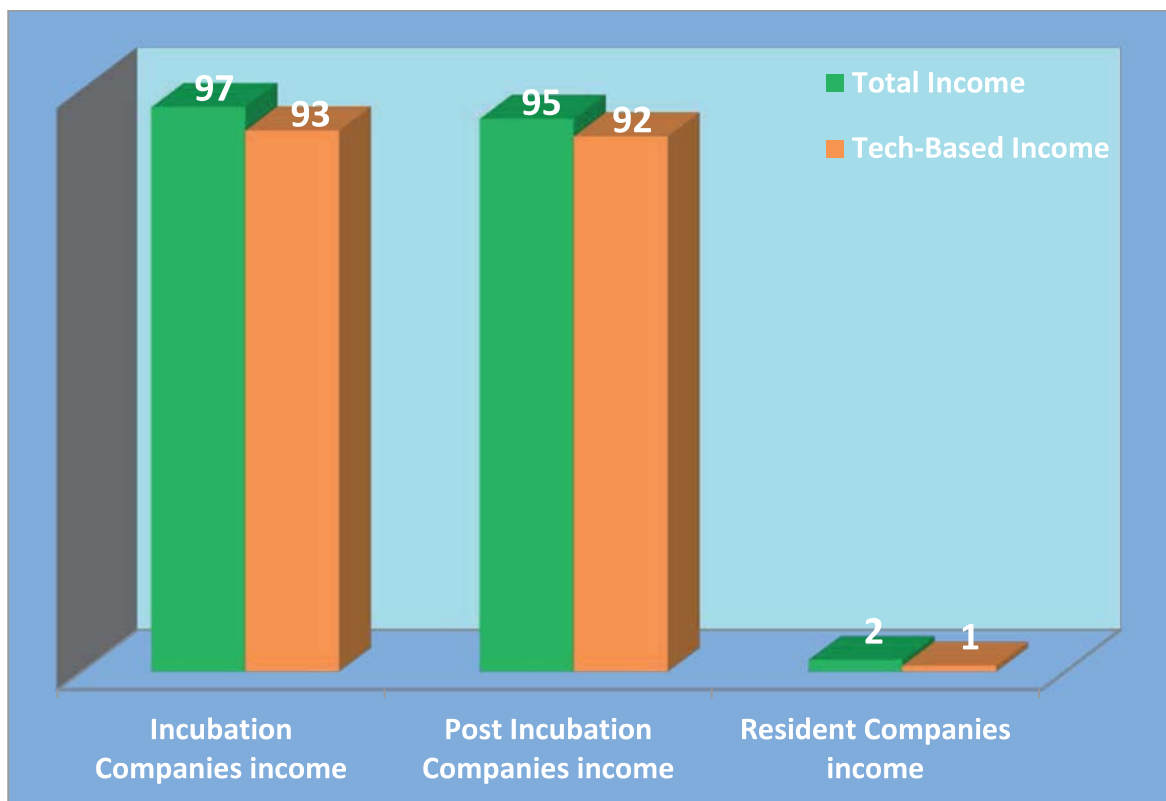
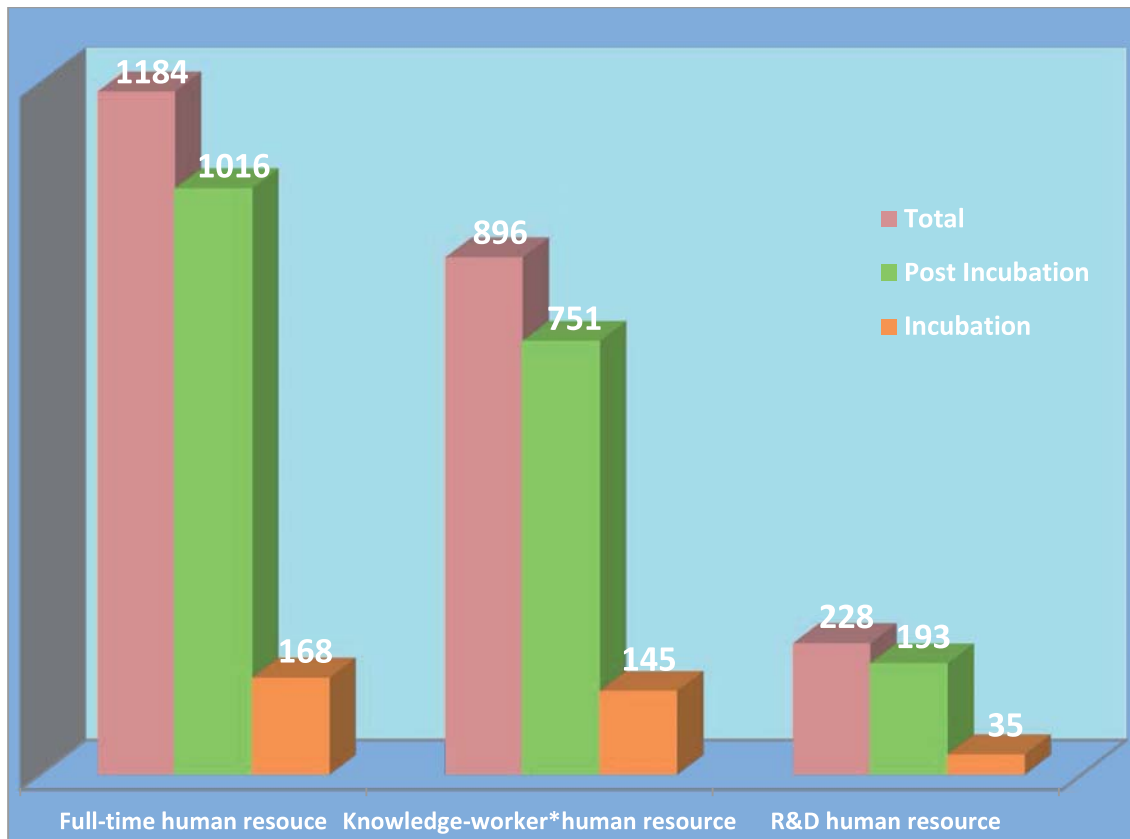Figure (7): Resident Companies (post incubation or incubation) total/tech-based income in Million USD

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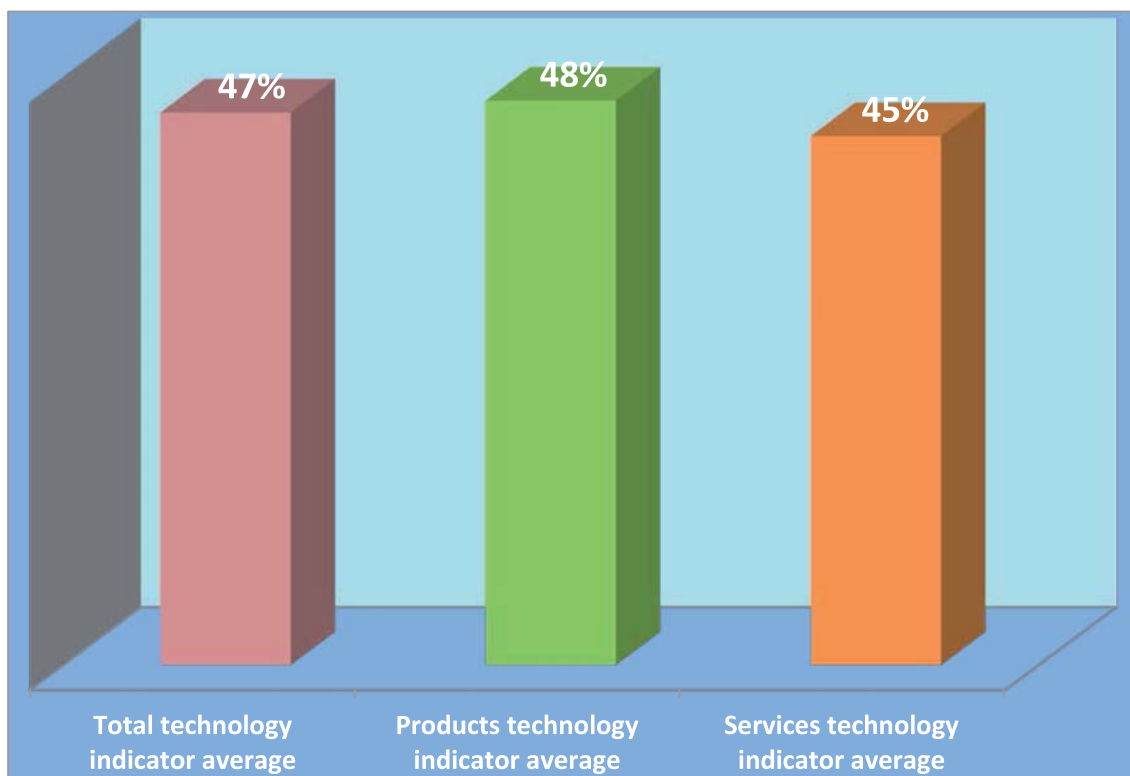
Figure (8): Number of resident Companies (post incubation or incubation) human resources

Figure (9): Resident Companies technology indicator average status

*: Knowledge-workers are the personnel with bachelor degree or higher academic level

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3.6.2 Specific results

After doing the evaluation process, the points in three indicators would be calculated and presented to companies in the form of specific results report. In the report the status of each company in each indicator is defined and the company can identify its strengths and weaknesses, and by using consulting services eliminate the weak-points and empower the strongpoints.

Using radar charts in specific report of companies

The final status of each company would be presented in the form of radar chart. Radar charts are used to let the companies know their weaknesses and strengths and also identify the types of support that would be needed.

Critical area is marked on the chart with red lines. The critical area of each chart is place which if the evaluation results placed on it would be considered as a weak performance level (level C), and favorable area in each chart which is marked with green lines means that from the evaluation viewpoint the performance of the company was evaluated favorable (level A), and if the evaluation result place in between of red and green lines it would be considered as intermediate level of performance (level B).

The specific results report of a company would be exampled in figure 10, according to the UTSTP resident companies' evaluation in 2015.

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Residents Evaluation Report, 2015

Company title	example	ID	90086	Year of Establishment	2005	Year of Admission	2011	Level of Maturity	Post Incubation

Human Resource Status

Year of Evaluation	#Insurance List(month per year)	#Insured Staff	#Full-time	R&D%	Academic Level%	Human Resource Points	Quality of Combination	Final Human Resource Level
2015	12	20	18	12%	85%	19	Good	B

Technology Status

Year of Evaluation	Row	Product/Service Name	Annual Total Income($)	Technology Indicator	Final Technology Indicator	Final Technology Level
2015	1	Product A	150,000	55%	70%	B
2015	2	Service B	400,000	75%		

Financial Status

Year of Evaluation	Total Assets($)	Total Costs($)	Total Income($)	Turnover($)	Annual Economic Growth%	Final Financial Level
2015	100,000	70,000	200,000	270,000	40%	A

Evaluation Chart

Out of Green - Favorable — Ряд1
Between Red to Green - Intermidiate, In Red - Weak — Ряд2
Company`s Point — Ряд3
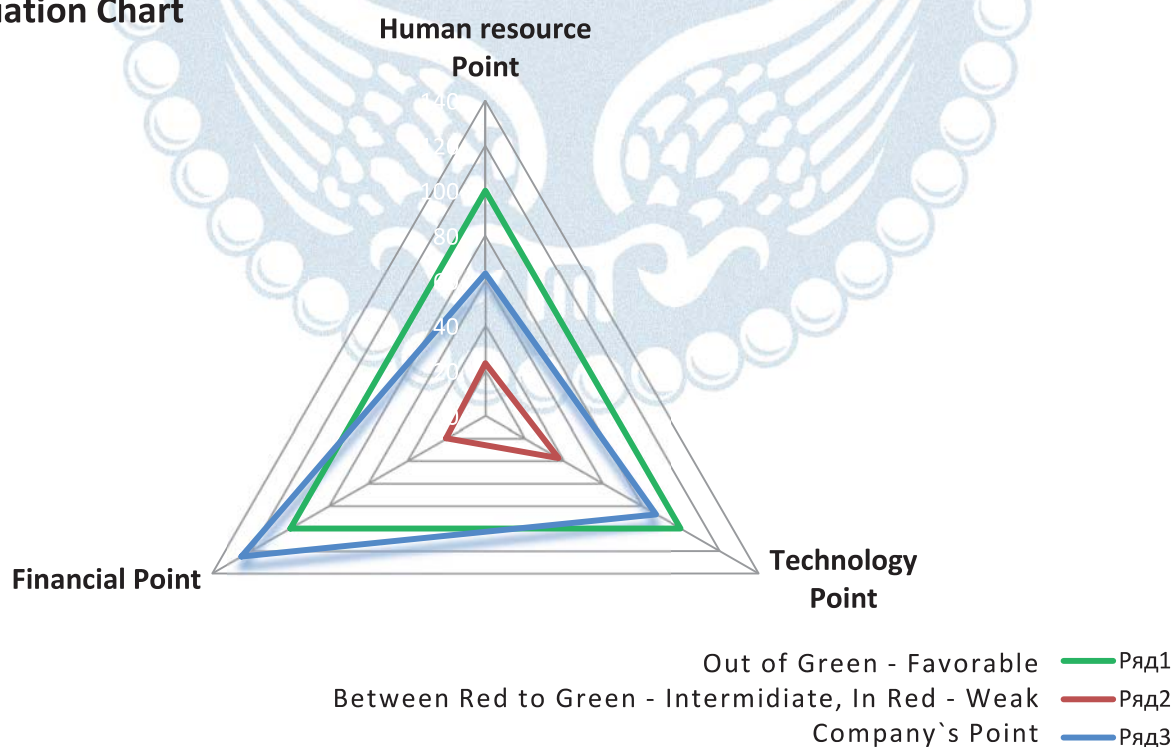
Figure 10: Specific results report related to a resident company, 2015

4. Conclusion

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A total value which is created by resident companies, is a key and important factor in science and technology parks for valorization of investments, achieved results, created values, and achieved outputs from previous investments (that how successful the previous investments are, based on the executive's goals and missions of park), so regarding this important issue the correct and exact understanding from the companies' latest status on the basis of valid information is considered as an obvious affair in crucial decision-makings in STPs.

By using the general results which is obtained from the evaluation process output a correct and effective analysis from the latest status of the park could be achieved, and based on the analysis the amount of outputs, and created values from previous investments, amount of needed investment, and value of the park for investing and accordingly the amount of investment should be acquired from investors, and could convince them to invest, are gained. As an instance when STPs' policy and decision makers be aware of the export of products/services, the total revenue, costs, turnover, human resource and knowledge workers in R&D section the average of technology indicator, and technology level of all resident companies precisely and in detail, subsequently do more realistic analysis and by using the information, and based on correct data can valorize the park realistically and on that basis attract the required investment from investors and other partners.

Thus, according to the above, as supportive organizations of creating, stabilizing, growing and developing knowledge-based companies the performance of STPs and their resident companies need to be evaluated and observed constantly and the distance of existing status of parks' supportive and facilitating performances to the favorable status in each section should be identified. Since without regular evaluation, finding inefficient parts and discovering the inabilities would be impossible. Neglecting this issue in addition to leading the park to the failure and losing investment values and assets, will cause the dissatisfaction of resident companies and could lead to the failure of many of them either.

The concept of Science and Technology Parks is like Symphony Orchestra. Just as to perform a great symphony qualified music instruments and a high quality concert hall is essential, the role of talented musician and world-class conductor for the orchestra performance success is crucial. To achieve this success and increase the value and credit of science and technology parks, establishing an evaluation system is evident.

The introduced evaluation system in this paper is designed in a way that could be coherent and meet required applications in simple and functional form. Using this system can prevent fictitious and non-technological companies' admission/residency which significantly have lowered or even eliminated the parks' level of value and assets. Also by admitting/continuing the residency and supporting successful companies would cause the empowerment, survival, growing and development chances and raised the level of investment, assets and value creation in park. This important could become a major contributor to attract the required investment to promote the activities and efficiency.

The introduced evaluation system with favorable characteristics, have the needed agility and the results of its implementation cab be used in making many important decisions by parks' directors and managers, such as estimating the park valorization, outputs and results of previous investments and also to convince partners and other investors, to attract and provide the resources and required investment for the park.

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