

LIBERTY TECHNOLOGY PARK CLUJ A CASE STUDY OF SUCCESSFUL ENTREPRENEURSHIP

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Abstract. *Science parks are a true foundation of entrepreneurship that promote innovation, by providing a setting in which public entities, research centres, universities and private companies cooperate, in order to accomplish scientific discoveries, transfer, and commercialization of technology. They encourage economic growth and competitiveness of regions that finance themselves from fees from rental of space (land, infrastructure, and building) grants, investments, or payments by big companies for R&D contracts, especially if the techno parks associated with universities. The scientific and technological parks promote the economic development of regions and cities by: creating new business opportunities and adding value to existing companies, entrepreneurial supervision and incubation for newly established companies, creating jobs in the scientific field, increasing collaboration between universities and companies. The aim of this paper is to examine if Liberty Center Science Park located in Cluj Napoca, a city located in Romania, can be considered as a benchmark for technological developers. The methodology used is data collection, by examining the existing data in the form of databases (notably, public financial data), reports, newsletters, press releases, etc. regarding the science park Liberty Center Cluj. The purpose of this study is to examine what are the strengths and weaknesses of the project and proffer possible solutions for management of the future science park. Another purpose of this study is to investigate what are the strengths and weaknesses of the project and offer possible solutions for the management to improve their performance. The conclusion of the study is that Liberty Technology Park Cluj is a case study of successful entrepreneurship. Almost or financial indicators support this assertion-profits and turnovers have continuously increased in the following three years after the inauguration. Similar trends have had the current assets and the number of employees. A weak point is that the local university cannot cope with the pace of demand for young IT specialists, especially for the reason that the number of undergraduates is still too small and that the lecturers are not enough financially motivated.*

Keywords: *Science Park; Liberty Center; Cluj; entrepreneurship; information technology.*

Introduction

The Science and Technology Parks are groups of legal entities established on the basis of association agreements, which includes organizations in the field of science, innovation, and technology transfer, economic agents that use scientific results and innovations in their economic activities. These entities act as links between scientific researchers, industry, and entrepreneurs, for their mutual benefits, turning innovative ideas into added value for communities. One of the main objectives of this form of organization is the promotion of high-tech entrepreneurial knowledge. Businesses developing within these platforms benefit from technical facilities, services and a dynamic environment for research.

Science parks habitually finance themselves from fees for rental of space (land, infrastructure, building) and grants, investments, or payments by big companies for R&D contracts with universities and/or research institutes (Oxford, Cambridge, Stanford, etc). After Stanford University started a research park in the early 1950s (the oldest in the world), Silicon Valley community boomed. Nowadays, there are over 400 science parks worldwide. There are various typologies of science parks, such as: technological parks, research parks, science and technology parks, innovation centers, technological incubators, business incubators, etc.

The objectives of scientific parks are the following:

- the technological transfer of research results from innovative entities to companies interested in manufacturing products or packages of competitive products and services;
- market capitalization of scientific research results;
- creating new jobs in advanced technologies and stimulating the innovative and technical-scientific potential of academic, university, researchers and students;
- attracting new financial sources for higher education institutions and R & D organizations, development of the scientific, technological and economic potential at regional level.

According to UNESCO, the number of Science Parks in Europe is 230, as follows:

Table 1. The number of Science Parks in Europe

Western Europe		Eastern Europe	
Belgium	6	Austria	1
Denmark	5	Czech Republic	2
Finland	24	Estonia	1
France	60	Latvia	1
Germany	13	Poland	4
Greece	4	Russia	3
Ireland	2		
Italy	6		
Luxembourg	1		
Norway	2		
Portugal	1		
Spain	5		

Sweden	12		
Switzerland	7		
The Netherlands	6		
Turkey	1		
United Kingdom	63		
Total Western Europe	218	Total Eastern Europe	12

Own calculations after the data provided by UNESCO in the "Science Policy and Capacity-Building" report

There is certainly an imbalance in the number of science parks in Western Europe in comparison to those located in Eastern Europe, due to the historical gap in terms of economy and management, after the II-nd World War. After the fall of the iron curtain, Eastern European states entered have applied a hyper-centralised research system, run by the state, without any private scientific parks.

After 1990, the place of the former industrial platforms was taken by scientific and technological parks, where top companies are operating. In the European Union, the innovative clusters are an "engine" of economic development and innovation. They have grown enormously from the French Industrial Districts Club founded in 1998, or the Cambridge High-Tech Cluster, to industrial organizations such as: automotive, biotechnology, eco-innovation, optical technologies, computer and telecommunication technologies, space technologies, etc. In the last two decades, the trend is to develop the old industrial districts into industrial clusters or science parks.

Literature review

The new millennium started with the evident reality, that the industrial sector is absolutely reliant on science developing, so the universities are the heart of intersectoral research production, having as outcome the growth of the number of products developed and commercialized by companies (Zucker et al., 2002, pp.138–153) in research-intensive industries. In 2004, Shane and Venkataraman defined technological entrepreneurship as „the processes of assembling resources, technical systems and strategies by an entrepreneurial venture to pursue opportunities (Shane & Venkataraman, 2004, p.32).”

Previous studies have revealed that the success of science parks in the USA such as Silicon Valley, Route 128, Triangle in the US and Cambridge Science Park in the UK have been the global benchmarks that influenced other countries such as Kuwait, Brazil, Russia, Israel, India, Taiwan, and China to acknowledge the benefits resulting from a science park policy (Ratinho & Henriques, 2010, pp.278–290).

Starting from 2007, after the adhesion to the European Union, Romania became attractive for IT business for many reasons, including a generous resource of graduates from a university system strong in math and physics; rather low costs; a time zone and distance favourable to European companies; and an enthusiastic, polyglot work force. Much of the software activity is taking place in Cluj-Napoca,

which is quickly becoming Romania's technopolis. as one-third of Cluj's 300,000 inhabitants are students. More than that, people from Cluj are renowned for their seriousness. "You can find local talent with a higher work ethic than in Bucharest," said Roman Foeckl, managing director of CoSoSys, a Cluj-based developer of software for portable storage devices and endpoint security in an article published in 2008 by www.informationweek.com (Romania Proving Popular As Software Outsourcing Destination, on 1/30/2008).

In 2016, in Romania only, revenues from IT companies exceeded 2.4 billion Euros. Over 86,000 programmers work in IT, which means about half that of people working in Silicon Valley. Information and communication technology (ICT), which encompasses activities such as the manufacture of electronic components or of computers and consumer electronics, as well as telecommunication, information technology services, web portal activities, currently generates about 6% of Romania's GDP. More and more world-renowned IT companies are opening offices in Romania, both because of well-trained graduates and professionals who know foreign languages and because of low costs compared to Western Europe, the US or Asia. Brainspotting has published in 2016 its annual IT & C Talent Map, which identifies Romanian IT & C trends, the most sought after areas and specializations, candidates' expectations, average salaries, and the most attractive cities. According to the study, Romania has the best ratio for IT&C professionals per capita among Central and Eastern Europe countries, and cca 110,000 professionals, followed by Poland, with 100,000 IT specialists. There are 20,000 companies working in the IT&C field, and more than 100 companies have over 200 employees. There is a need for 12,000 new specialists/ year to meet the market requirements, while in fact there are approx. 8,500 IT graduates per year and approx. 1,800 telco graduates. Talent is spread among 12 cities, with 4 large hubs, 2 secondary and 6 small contenders for marginal talent which are targeted more and more for either small operations or secondary centers. The main centers are Bucharest, Cluj-Napoca, Iasi and Timisoara, followed by Sibiu and Brasov. Craiova, Pitești, Ploiești, Galati, Constanța and TârguMureș are becoming more and more attractive to companies. There are 1,500 IT graduates and 410 telecoms in Cluj, and the most sought after companies are Google, Emerson, Endava, Bosch, Microsoft. 20% of developers are here (Brainspotting-IT Talent Map Romania 2016).

Methodology

The aim of this paper is to examine if Liberty Center Science Park located in Cluj-Napoca, a city located in Romania, is a benchmark for technological developers. The methodology used is data collection, by examining the existing data in the form of databases (notably, public financial data), reports, newsletters, press releases, etc. regarding the science park Liberty Center Cluj. The purpose of this study is to investigate what are the strengths and weaknesses of the project and offer possible solutions for management of the future science park.

Findings

In Romania, the Business Incubators are financed from both private and public sources. The first Technological Business Incubators were established in the 90's, with financial support from PHARE Programme, The Ministry of Research and managed by the Romanian Centre for Small and Medium Enterprises.

According to Law no. 50/2003 on Technology and scientific parks, in Romania, Science and technology parks are an area where developed activities as teaching, research, research are results dissemination, and where these are exploited by economic activities. This was the start for an ambitious project, which was the Multiannual Program of Establishment and Development of Technological and Business Incubators in Romania (2002-2012), coordinated by The Agency of Implementation of Projects and Programs for Small and Medium Enterprises (A.I.P.P.SME's), and implemented by The United Nations Development Program (P.N.U.D.), Romania.

In June 2016, the Law no. 102/2016 on business incubators entered into force. According to this act, founders of business incubators are entitled to a series of tax incentives to be granted under aid schemes: exemption from land tax, exemption from tax on buildings, exemption from payment of any taxes due for release any urban planning certificates, building permits and / or demolition of buildings for land and buildings related to the business incubator, with the approval of local authorities.

In July 2017, the President of Romania promulgated the Law approving the Government Emergency Ordinance no 3/2017 for amending and completing the Law no. 227/2015 regarding the Fiscal Code. Employees of IT companies benefit from tax exemption on wage and wage income as of 1 July. In order to benefit from these tax incentives, they must hold a post-graduate degree or a postgraduate diploma awarded by an accredited higher education institution after the completion of the first cycle of undergraduate studies, a computerized compartment, and the activity of each income tax-exempt programmer has generated revenue of at least 10,000 Euros per year. These provisions also benefit employees of newly established IT companies, companies that will not have to prove that they have earned € 10,000 / programmer. Also, if during a fiscal year a micro-enterprise earns more than 500,000 euros or the share of consultancy and management revenue in total revenues is more than 20% inclusive, it owes profit tax, starting with the quarter in which it was exceeded any of these limits.

In June 2017, a joint order of Ministers of Labour and Social Justice, Public Finance, National Education, and Communications and Information Society, was published. It provides facilities for IT employees (the Order no. 409/4020/737/703/2017 regarding the assignment in the activity of creation of computer programs).

This Order has corrected the previous published Ministerial Order no. 872/2016, which could prevent programmers in service centres from benefiting from the 16% income tax exemption. The main problem generated by Order 872/2016 was to restrict the application of the exemption only to companies that could demonstrate

that they directly marketed software or contributed to the realization of a product for sale. If the interpretative paragraph was not modified, it would have affected more than 30,000 people working in the IT service centres in Romania.

In order to benefit from these tax incentives, people working in the field of computer software development have to meet a number of minimum conditions specific to this economic branch, namely: to be employed in the IT industry, the job to be part of a specialized department which is distinctly recorded in the employer's organizational chart, the employee has a higher degree in computer science, the payroll for the employees benefiting from the tax exemption to be done separately, and the activity of each programmer must have generated at least income 10,000 euros per year. Also, IT employees of newly established firms also benefit from these provisions, companies that will not have to prove that they have earned EUR 10,000 for each programmer. In the previous form, the order created practical difficulties in applying tax exemptions to employees of IT companies that only provided software development services and to software developers who were in charge of software maintenance.

Cluj has the highest density of IT specialists compared to the active population in Romania and is internationally known as an IT HUB and constantly attracts new companies. In 2012 it ranked 96th in Tholons' top 100 outsourcing sites. Cluj is attractive by: critical mass of specialists, over 12,000, support universities: UBB, UTCN, infrastructure (airport, internet, etc.), the number of young people (25% of the city's population) field, culture of work, educated in the IT industry by external clients for whom they are working and that have high quality standards, standards that have been taken over and local, ecosystem of collaboration on universities - companies (through clusters, etc.). Unfortunately, the current demand for IT talent surpasses the candidate pool, even if the Faculty of Mathematics and Computer Science currently has 660 graduates, and the Faculty of Automation and Computer Science at the Technical University has more than 700 graduates annually.

Liberty Technology Park Cluj was launched on December 5, 2013 and means over 17,000 square feet of office space. The investment amounts to more than 15 million euros and is an initiative of Fribourg Capital under the patronage of businessman Ion Sturza, former Prime Minister of the Republic of Moldova. The technological park has now 33 companies and start-ups, both Romanian and foreign, with over 1,700 employees. Of these, almost 200 are expats, and by the end of the year 2017, a total of 2,000 employees are expected to work at Liberty Center. 70% of Liberty Technology Park residents are IT companies, and more than half have software development and R & D departments (R & D). At present, the technology park is 100% occupied, and most of the residents are IT companies such as Siemens, IBM, Halcyon Mobile, Altran, Iron Mountain Romania, Control Data Systems, Digital Ventures Development, Luminos Software, Voquz, SmartUp. The Technological Park also hosts the Spherik accelerator as well as start-ups, including Planable, SuppOffice. The technology park has a high-level of energy, efficiency and has received many distinctions for both design and functionality.

The facilities of Liberty Technology Park Cluj are the following:

- 8 buildings with 565 parking units and, in addition, bicycle parking racks, facilities for people with disabilities;
- Green areas with interior gardens and a lake, retail area, leisure & relaxation area: gym and multifunctional ground, coffee Shop, restaurant with terrace facing a lake;
- Event area with conference rooms, a business Accelerator and Server spaces.

We have analysed the evolution of the main economic indicators of IT companies located on Liberty Technology Park Cluj in the period 2013-2015. For this purpose, we have used the public data base of the Romanian Ministry of Finance (Economic agents and public institutions - identification data, tax information, and balance sheets, retrieved on the official website <http://www.mfinante.gov.ro/pjuridice.html?pagina=domenii>). This database contains information from the Romanian Ministry of Finance on the registration of taxpayers, legal entities and public institutions, tax returns (VAT, excise duties, etc.), the balance sheets of the last six years of commercial companies and operative records of overdue liabilities to the state budget.

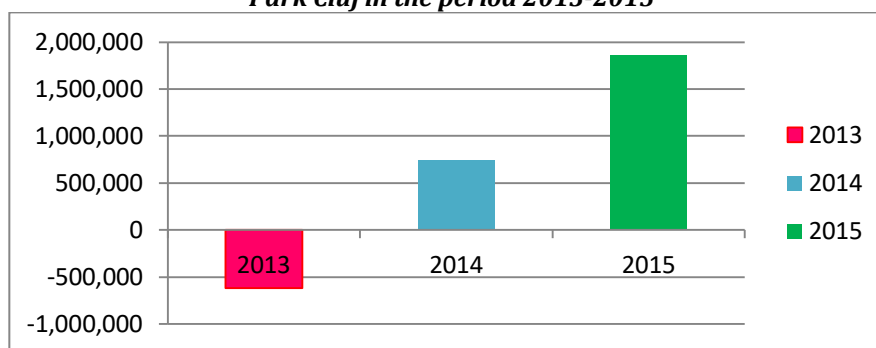
Table 2. The evolution of the main economic indicators of IT companies located on Liberty Technology Park Cluj in the period 2013-2015

Company	Year	Profit	Turnover	Debts	Fixed Assets	Current Assets	Employees
Halcyon Md	2015	1.280.615	5.558.225	758.752	408.711	1.604.991	36
	2014	921.146	3.603.712	565.949	159.065	1.187.116	30
	2013	159.305	1.982.644	380.274	99.682	447.049	23
Control Data Systems SRL	2015	790.024	4.976.990	542.694	182.904	2.365.950	9
	2014	701.997	5.087.102	315.527	198.231	1.269.526	6
	2013	575.161	3.837.693	365.320	89.024	908.159	4
Regal Beloit SRL	2015	35.083	552.251	964.793	403.334	672.549	11
GTS Telecom	2015	-1.566.307	80.371.448	60.592.215	39.449.612	43.742.475	121
	2014	-1.921.262	79.137.887	63.790.903	50.245.338	37.560.378	126
	2013	-1.910.413	85.036.652	65.854.395	62.469.034	28.957.384	128
Makronetz Development SRL	2015	399.403	938.154	112.723	14.695	675.062	8
	2014	250.202	253.344	16.203	0	258.886	0
Luminos Software SRL	2015	72.595	764.072	76.071	287	130.766	4
Voquz IT Solutions SRL	2015	-63.449	113.113	357.778	41.553	245.149	1
Altran Romania SRL	2015	910.396	5.319.898	166.045	119.624	1.883.874	0
	2014	787.772	4.516.212	158.743	80.579	1.133.418	0
	2013	559.529	3.509.552	154.574	72.797	491.089	0

Source: own calculations after the data provided by the Romanian Ministry of Finance on the registration of taxpayers

The evolution of profits for the IT companies located on Liberty Technology Park Cluj was positive in the period 2013-2017; profits rose from a loss of lei -616.418, to lei 739.855 in 2014 and lei 1.858.360 in 2015. Such evolution can be explained by the increasing ratio between capital allocation and sales. IT companies that use a high performance IT system need fewer human resources to manage and run the company. Also, IT companies benefit from profit tax exemptions and, occasionally, from increased borrowing power, cheaper lending methods.

Table 3. Evolution of Profits of IT companies located on Liberty Technology Park Cluj in the period 2013-2015

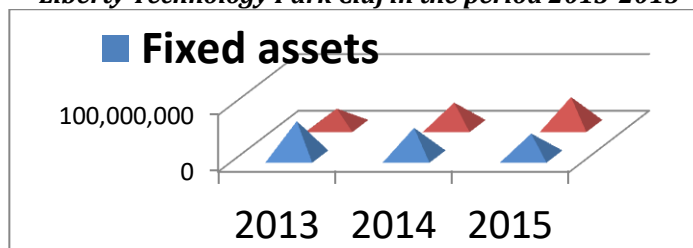


Source: own calculations after the data provided by the Romanian Ministry of Finance on the registration of taxpayers

A similar trend had the turnovers, which increased from lei 94.366.541 in 2013 to lei 98.041.900 in 2015. Although current assets had a growing trend (from lei 30.803.681 to lei 51.320.81651.320), fixed assets decreased from lei 62.730.537 in 2014 to lei 40.620.720 in 2015. The causes can be the sell or abandon of assets, loss of value caused by re-evaluation of obsolete or outdated assets.

Debts have decreased, from lei 66.754.563 in 2013 to lei 63.571.071 in 2016. This situation is typical for start-ups or for companies in their first years of activity—they usually start business with borrowed money and gradually they pay their debts from their incomes.

Table 4. Evolution of fixed assets and current assets of IT companies located on Liberty Technology Park Cluj in the period 2013-2015



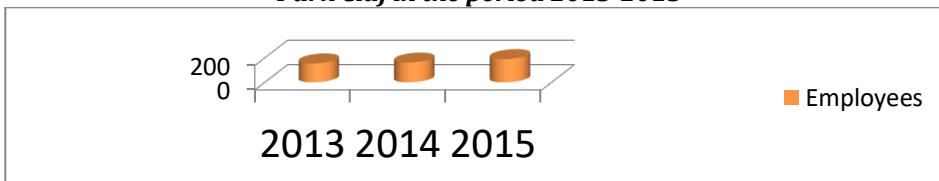
Source: own calculations after the data provided by the Romanian Ministry of Finance on the registration of taxpayers

One encouraging thing is that the number of employees has steadily increased, of course, not in a quick way, because the field is work-intensive. Additionally, some

of the IT experts work as freelancers, usually from home. Remote work is a loyalty and motivation tool for IT people; therefore youngsters require a flexible program and the opportunity to develop their career, while seniors are looking for stable firms, big salaries and benefits.

Regrettably, the retention rate of IT specialists has fallen over the last years. The reason for the labour force crisis in information technology in Cluj, lies in the problems of the public funded university that prepares the specialists (Babeş-Bolyai University). This institution of higher education has unoccupied organizational charts. Besides, the basic salaries for university assistants are very small, completely unattractive for young specialists, who can easily find a private job, much better paid. Even if for lecturers and professors, salaries are bigger than those of young assistants, they are still undersized in comparison to wages for senior IT specialists. For instance, a junior programmer may have a salary of 1,000 Euros, while senior developers, can have 3,000 Euros per month if not more; they are much higher than wages of people working for the academia. In Cluj, companies crave to hire programmers specialised in desktop applications or android applications.

Table 5. Evolution of employees of IT companies located on Liberty Technology Park Cluj in the period 2013-2015



Source: own calculations after the data provided by the Romanian Ministry of Finance on the registration of taxpayers

Thanks to the encouraging trends of Liberty Centre, IBM opened in Cluj in July 2017, the fourth business services centre in the country, after Bucharest, Brasov and Timisoara in Liberty Technology Park in Cluj.

Conclusions

Liberty Technology Park Cluj is a case study of successful entrepreneurship. Almost all financial indicators support this assertion—profits and turnovers have continuously increased in the following three years after the inauguration. Similar trends have had the current assets and the number of employees. The good location of this technology park in the heart of Transylvania and the relative cheap and qualified workforce that works in IT domain have turned Cluj-Napoca in a true attractor for both IT companies and specialists, for the quality of life and health services in the city, university education, jobs, the dynamic cultural and artistic environment, the economically active environment, especially on high added value services such as IT, pharmaceutical industry, and consultancy. Most probably, IT companies will continue to move to Cluj and also to Liberty Center, a top location for corporations. Due to the growing demand for human resources, companies will

have to increase wages. So that the companies with high added value will stay in Cluj, and those with low added value (outsourcing of IT experts) will be reduced. A larger number of companies will be more and more involved in innovative projects generating own products. Certainly, in Cluj the IT industry evolves from a low value-added one (outsourcing, ie hire of IT experts) to a high added value (innovative / specialized services, own products), implicitly higher revenue for companies.

Hopefully, more students will have the chance to be trained in high-tech domains. Babeş-Bolyai University (UBB) in Cluj-Napoca launched in 2016 the Institute of Advanced Studies in Science and Technology (STAR-UBB), the first of its kind in Romania, which aims to create mechanisms for BBU's entry into the top the best 500 universities in the world. The program was accredited in 2016 by the Ministry of National Education, and the students will be part of an international program where the courses are supported by NTT DATA Romania academic staff and specialists, as stated by the official website of the Institute of Advanced Studies in Science and Technology (<http://starubb.institute.ubbcluj.ro>).

The Romanian state should continue to encourage the advancement of the technological Entrepreneurship under the Agenda 2000 of the European Union, exempting from some taxes the technological start-ups and helping them to develop by establishing an innovative and collaborative framework especially for start-ups, for SMEs.

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