

SPIN-OFFS IN THE LJUBLJANA REGION

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ABSTRACT

Modern societies have shown the positive contribution of spin-off companies in the socio-economic sphere. There are a number of conditions and circumstances under which it may be of value to encourage spin-offs. Policy-makers may therefore be interested in promoting and developing certain types of spin-off given their potential benefits, particularly in the area of competitiveness, innovation, growth, transfer of research achievements to the market and the internationalization of regional content. The Ljubljana Technology Park is a pioneer in this field in Slovenia. This article draws on experience from Ljubljana Technology Park, Slovenia, where research spin-offs were developed despite the relative low support from the local authorities and low involvement of Ljubljana University. The reason for studying the spin-off phenomenon was to identify a way to stimulate innovation and research spin-off creation in the Ljubljana region.

In the proposed paper the spin-off characteristics, strengths and weaknesses are analyzed. The comparison between the EU environments and the Ljubljana's achievements is made. The specific Slovenia's (maybe east Europe) types of academic spin-off are described and the Ljubljana's procedure, activities and plans are presented.

Keywords

Spin-off, spin-out, technology start-up, innovation process, research to the market, innovation management

1. INTRODUCTION

The advantage and privilege of working in Technology Park, the interface between industry and the research environment, is the opportunity to help in transforming research results and intellectual property into an economic category. The transformation appears mainly through the establishment of new organisational forms as are project (less formal) or companies (more formal).

Whenever research results reach a level that allows them to be promoted outside the academic environment, it is also possible to conduct technology transfer through the sale of licences or the establishment of new spin-off companies. Technology transfer and/or the formation of spin-off companies are a desirable goal in most modern academic environments and one of the topic missions of Ljubljana technology Park. Exploiting research results in this manner directly contributes to prosperity and to raising the technological level of products and production procedures in the environment.

2. SPIN-OFF COMPANIES

Modern societies have shown the positive contribution of spin-off companies in the socio-economic sphere, particularly in the area of competitiveness, innovation, growth, transfer of R&D achievements to the market and the internationalisation of regional content. Spin-off companies appear in various environments due to a number of factors, but the greatest contribution to regional development is made by spin-off companies from research and industrial environments, which are distinctly technology-centred companies. Public sector spin-off companies mainly contribute to the construction of more appropriate support environments (they are mostly established due to the reorganisation of services and the introduction of technological achievements within a municipality, a region or the state administration). Each form of Spin-off Company has its own characteristics, strengths and weaknesses. One common characteristic is that the parent organisation in the research, industrial or public spheres transfers rights to the newly established firm. Such rights may take the form of intellectual property or may be property in kind. The reason for their establishment may be based on a business initiative or may be a consequence of restructuring or reorganisation. The combination of greater responsibility and incentives for staff in the spin-off company leads to greater efficiency. Their efficiency, effectiveness, responsiveness and positive impact can be increased through mutual links, understanding and synergistic effects.

Spin-off companies are also important because they represent a confluence of knowledge, capital and enterprise, and on the basis of experience and knowledge they attempt to penetrate markets. In an economy where the basic motor of growth is knowledge and invention, spin-off companies from the research sphere are often pioneers of technological development and innovative organisational forms of operation.

Spin-offs from the research sphere

Characteristics:

- Newly established companies, with the founders including a person from a research environment (usually the bearer of technology, innovation or know-how)
- Technology developed in a research environment appear on the market through the company establishment

- The company exploits technology under agreement with a research institution or university
- The company's owners often include staff and students
- The company is established in a technology or science park in an incubator
- A university or research institution holds a company capital stake (minority, majority, full ownership)

Strengths:

- Higher survival rate and longer lifespan (over 80% survive five years)
- Double, partial employment (in the university and the company) enables easier survival and ensures greater operating stability, quality jobs, high added value per employee
- Continuous use of public support schemes, research environment, equipment and people
- Mastering, introducing and exploiting new technology, following trends, internationalisation of regional content, external connections, raising the innovativeness of the region

Weaknesses:

- Many companies remain small, slower growth, technology orientation, tendency towards consultation, lower number of products, in some places difficulties with focussing activities
- Start-ups require capital and infrastructure, seed and venture capital is essential, incubator or technology or Science Park with services
- Lack of business education of staff and attachment to the parent environment
- Contribution to regional trade and the number of jobs is modest
- No existing marketing network

Spin-offs from industry

Characteristics:

- Created on the basis of opportunities recognised by staff (or groups) in the parent company (business initiative), or by the company itself (business initiative or restructuring)
- Companies have relatively low levels of innovation but probably higher growth rates
- The reason for their creation may be reduction in the scope of activities, restriction of diversity or focusing of activities of the parent company, sale, acquisition or recapitalisation of certain units of the company (activity) and transfer from the parent company to the new company...

Strengths:

- Above-average growth and very low failure rate (experienced founder, incubator function taken on by the parent company, existing marketing, guarantees, credibility, companies network ...)
- They often contribute to greater competitiveness and employability in the region
- They foster innovation and the establishment of new firms (transfer of their own developments)
- They retain and supplement knowledge of market rules and potential customers, and expand the existing marketing network

Weaknesses:

- Business-based spin-offs from industry show a tendency for growth in the long term as well; the same does not apply to organisational or capital-based spin-offs
- Increased need for additional investment, especially in the case of industrialisation or increasing production, and the demanding logistics of internationalisation of operation

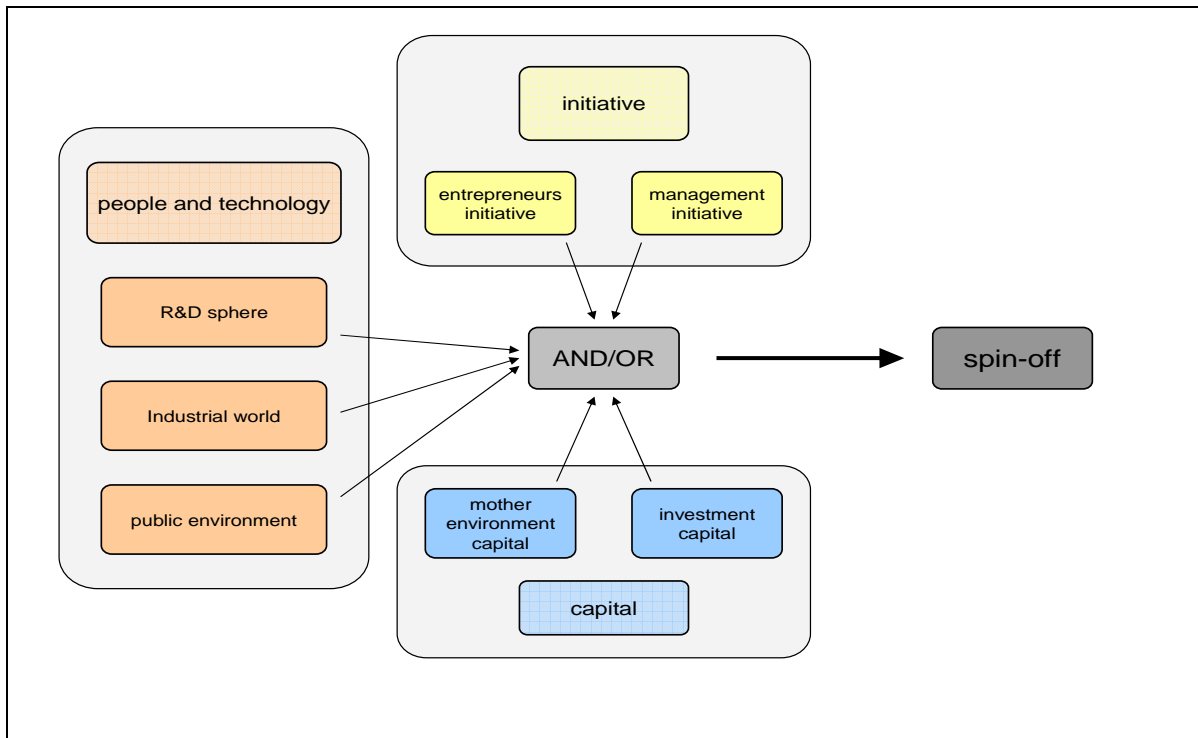


Figure 1: Worlds of spin-off companies

Another common phenomenon is for spin-off companies to display mixed characteristics of separation from the research sphere on an industrial initiative, or the reverse: separation from industry on a research sector initiative. These cases are marked by a mixture of positive characteristics. The desire for success is dictated by an optimal selection from the research and industrial spheres. Capital or ownership also plays an important role in all forms, influencing the formation of strategic goals at the time of establishment. In terms of the nature of capital, spin-off companies can be divided into full, extended or apparent spin-offs.

1. SPIN-OFFS AROUND THE WORLD AND IN SLOVENIA

There is no general formula for establishing successful spin-off companies. In societies where industrial property in universities and research institutions is accompanied by an organised environment and venture capital, researchers – the bearers of ideas, the institutions – owners of industrial property and other strategic or economic partners establish spin-off companies.

It seems that, in the European Union countries, the number of spin-off companies is continually growing, although they are still much less common than in Canada or the US (between 1995 and 2000, 50 spin-off companies were established annually at universities in Canada, compared to 15 in Britain and more than 400 in Germany). It has been shown that the number of spin-off companies created from the research environment correlates with the total funding provided for research activities. Modern societies expect a certain number of spin-off companies for each percentage point of GDP allocated to research activities (including the construction of infrastructure, policy incentives, and the formation of enterprise initiatives); in Sweden there are now more than 250 such companies.

SPIN-OFF COMPANIES PER YEAR FROM THE RESEARCH ENVIRONMENT				
state	institution	no/year	interval	source
Australia	All	10	1991-1999	Thomburn
Belgium	All	4	1990-1999	Clarysse and Degroof
Canada	Universities	47	1990-1998	Cooper
France	All	14	1992-1998	Mustar
Finland	Public r&d	4,5	1990-1999	VTT data
Germany	Public r&d	58	1990-1997	ATHENE
Germany	Universities	467	1990-1995	ATHENE
Norway	Public r&d	41	1996-1998	ResearchCouncil of Norway
UK	Universities	15	1990-1997	PREST
USA	Universities	234	1994-1997	AUTM
Ljubljana	All	5	1995-2002	Tehnološki park Ljubljana

Figure 2: Comparison of the average number of r&d environment spin-off companies

In Slovenia, we find that the number of research companies, particularly from the university environment, is disgracefully low given the research funds invested. Research institutions are far ahead in the area of generating companies based on R&D results. Unlike universities, they have organised industrial property, they have established offices for technology transfer, and they are aware of its importance and economic value. Slovenian universities lag behind in this field, despite having more staff, greater funding and more impact on generations. It seems that, despite professional qualifications, universities have dissolved awareness of development, transition, trends and their mission in a sea of self-satisfaction, rigidity and monopolies. University guidelines and action determine the level of concentration of such a solution.

In our environment, spin-off companies from the research environment are established mainly by researchers – the bearers of ideas – and other strategic or economic partners. Spin-off companies in Slovenia are typically established to commercialise industrial property. Companies can design their activities based on research or development results. They are established by researchers or bearers of ideas. Technology transfer is carried out by transferring people from the research sphere to newly established companies. The disorganised legal and promotional environment makes capital participation by research institutions practically impossible.

Employees No. in Spin-off companies	0-5	6-20	>20
CANADA	33%	28%	39%
FRANCE	35%	43%	22%
GERMANY	51%	25%	24%
LJUBLJANA	69%	31%	0%

Spin-off field of activity	Canada	Australia	France	Ljubljana
Health care medicine, environment, food, biotechnology, pharmacy	46%	43%	30%	23%
Information technologies software, informatics, communications	21%	27%	29%	27%
Electronics and mechanics electronics, instruments, energy, mechanics	14%	13%	15%	35%
Natural sciences chemistry, physics, new materials, optics, aeronautics	4%	10%	17%	15%
Undefined	15%	7%	9%	0%

source: OECD and TP Lj

Figure 3: Comparison of spin-off companies in terms of number of employees and activities

By establishing spin-off companies in our environment, we at least ensure that the added value of industrial property (and the related new jobs) remains in the country. When industrial property is sold abroad, all the added value of technology or products developed at home remains abroad. However, none of these solutions take account of the fact that the owner of the industrial property is actually the institution in which the results were achieved, with public funding in at least half of all cases. Thus by failing to arrange conditions in this field, public institutions are closing the door to an important portion of income, greater independence from public funds and greater links with the market and with industry.

2. SPIN-OFF COMPANIES IN LJUBLJANA TECHNOLOGY PARK

In our activities over the last year, we have offered assistance in establishing eight spin-off companies from the research and industrial spheres. Based on our experience (the Park hosts 30 spin-off companies), we have designed a framework to manage the procedure of establishing spin-off companies. Initially, our guidance enabled bearers of ideas to continue growing and developing research achievements to a level enabling the establishment of a spin-off company and the affirmation of achievements outside the academic environment in the global market. The next rule is that we enable the establishment of a company independent of the physical location in the technology park incubator, on the premises of research organisations or in an industrial environment.

In the procedure itself, it is important first of all to record the activities leading to useful results for market exploitation under the spin-off company model. These include basic and applied research financed by state schemes, research contracted by industry, consultation activities and research and development activities financed internally.

Any of these activities conducted in the academic sphere (research organisations, universities, companies) can lead to an idea providing opportunities for commercialisation of the product, process, technology or procedure. Each of them will be at different stages of development and will have different potential for simple transfer to the marketplace at the time of assessing their market potential. We therefore need a definition of the individual phases of development of potential spin-off companies from the start right up to full independence. In the initial phase, the developer (group) recognises the market potential of the results of its work. The idea is further assessed, and if the results are favourable, the developer continues working towards a commercial product or service. Product development shows the need to protect intellectual property. During assessment of market potential and/or patentability, mutual relations must be arranged and the staffing structure of the future company formulated (more a problem of management and marketing than of production, technology and development). Further work on

the product and the business plan can lead to a decision that the idea is also a business opportunity, and that it is worthwhile establishing a spin-off company. The capital structure needs to be defined, and decisions taken on venture capital, a strategic partner, and participation by others in the company.

The next phase sees the establishment of a company. It may conduct its activities in an environment favourable for company start-ups and assessment of market potential: in the Technology Park incubator, companies are subsidised for up to four years. After this period, the company can remain an associate member of the Technology Park, but at commercial prices. In the next phase, the company becomes fully independent and moves to an industrial environment.

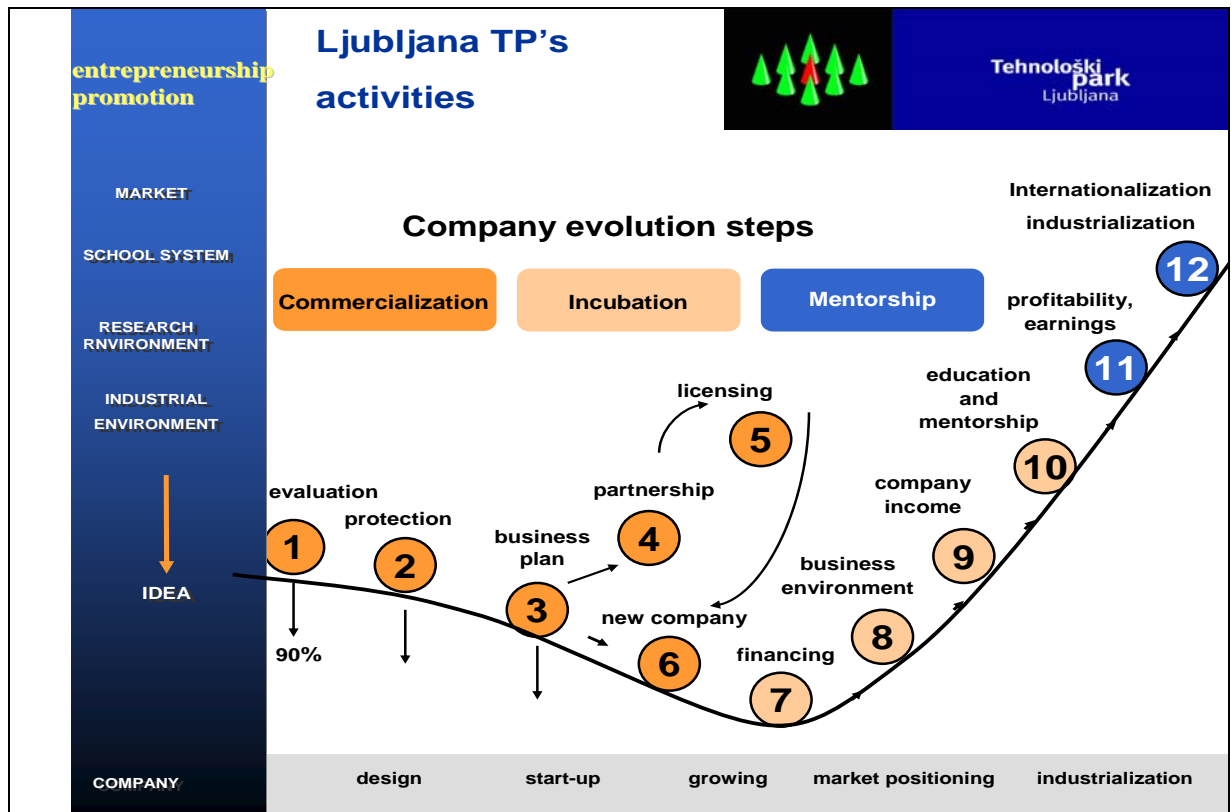


Figure 4: Development phases of companies in the Ljubljana Technology Park

To date 59 companies have joined the Ljubljana Technology Park, 20 companies have outgrown the incubation period and three companies have left the park. Of all the companies included, 38 have been start-ups and 30 spin-off companies. Ljubljana Technology Park, viewed as a group of high-tech companies, represents a rapidly growing, dynamic company. Companies currently employ 274 people with further education, while the operating processes of these companies involves at least the same number of outside workers. Revenue per employee in the companies in the park is more than 83K EURO, while the value added per employee is more than 23K EURO. Half of the companies generate income in foreign markets, while five companies are primarily geared towards exports. The fact that the companies have already attracted EUR 15 million in venture capital is further proof of their quality.

Since 2000, Ljubljana Technology Park has considered 19 initiatives meeting the criteria for inclusion among spin-off companies. These include Geming – project planning of geotechnical projects d.o.o. (a spin-off from the Department of Mining and Geology, Faculty of Natural Sciences and Technology, University of Ljubljana), Vacutech – vacuum technologies and

systems d.o.o. (spin-off from the Institute for Electronics and Vacuum Technology), IDS – systems with custom integrated circuits (spin-off from the Faculty of Electrical Engineering, University of Ljubljana), Stikos – switch components and regulation technology d.o.o. (spin-off from the Institute for Electronics and Vacuum Technology), Celica – research, development, production and sale of biomedical equipment d.o.o. (spin-off from the University of Ljubljana), Transcell – immunotherapy company d.o.o. (spin-off from a research project by the Educel company and the Blood Transfusion Institute), Quintelligence – intelligent knowledge management d.o.o. (spin-off from the Department of Intelligent Systems, Jožef Stefan Institute), Vode – consulting, project planning, studies, information technology d.o.o. (spin-off from the Water Industry Institute), Ilumina – (from the Faculty of Machinery). For some content, preparatory activities to recognise market potential were conducted as early as 1999.

SPIN OFF	Company	TP Lj adhesion	Tech. and people source	Initiative	Founders capital
1	AMES	jan.96	RR sphere, IJS	Entrepreneur	Personal
2	ELSYS	jan.96	RD sphere, IJS	Entrepreneur	Personal
3	GLOBALVISION	jan.96	RD sphere, IJS	Entrepreneur	Personal
4	INEA	jan.96	RD sphere, IJS	Entrepreneur	Personal
5	INTEKOM	jan.96	RD sphere, IJS	Entrepreneur	Personal
6	ISA.IT	jan.96	RD sphere, IJS	Entrepreneur	Personal
7	RACI	jan.96	RD sphere, IJS	Entrepreneur	Personal
8	RAIS	jan.96	RD sphere, IJS	Entrepreneur	Personal
9	RRT	mar.96	RD sphere, IJS	Entrepreneur	Personal
10	BALDER	sep.96	RD sphere, IJS	Entrepreneur	Personal
11	BIA Separations	nov.98	Industry, Bia doo	Management	Mixed
12	VSR	mar.2000	industryElsis doo	Management	Personal
13	SILON	mar.2000	industry,Indata doo	Management	Personal
14	VISITEL	mar.2000	University, FE	Entrepreneur	Personal
15	SENSUM	mar.2000	University, FE	Entrepreneur	Personal
16	OTTO Elektronika	jun 2000	University, SF	Entrepreneur	Personal
17	VAQUTECH	jun 2000	RD sphere, IEVT	Entrepreneur	Personal
18	GEMING	oct. 2000	University, FMR	Entrepreneur	Personal
19	STIKOS	oct. 2000	RD sphere, IEVT	Entrepreneur	Personal
20	IDS	nov. 2000	University, FE	Entrepreneur	Personal
21	CELICA	dec. 2000	Univeristy, MF	Entrepreneur	Personal
22	TRANSCCELL	dec.2000	industry, Educell	Management	Mixed
23	QUINTELLIGENCE	mar. 2001	RD sphere, IJS	Entrepreneur	Personal
24	VODA	mar. 2001	RD sphere, VGI	Entrepreneur	Personal
25	XLAB	sep. 2001	RD sphere, IJS	Entrepreneur	Personal
26	COSYLAB	feb. 2002	RD sphere, IJS	Entrepreneur	Personal
27	ABSTRATUM	mar.2002	Industry, Triglif	Management	Mixed
28	HIPERGO	mar. 2002	Industry,	Management	Personal
29	ILUMNIA	oct.2002	RD sphere, FM	Entrepreneur	Personal
30	VOTAN	oct. 2002	Industry,	Management	Personal

Figure 4: Spin-off companies included in Ljubljana Technology Park

1. CONCLUSION

All initiatives to promote enterprise, regional development and the economic environment are both welcome and essential. In its new initiative to select pilot projects for the development of business incubators in universities, the Ministry of the Economy felt the need for support guidelines in the area of spin-off enterprise. Ljubljana Technology Park, with the Technology Enterprise Development

Centre as the basic infrastructure, has accumulated the greatest amount of knowledge in this field and has successful experience, because the results of work shown are comparable on the European level.

The primary role of the Ljubljana Technology Park on the national level lies in the internationalisation of innovation and enterprise potential. On the local level, due to the specific features of our environment, we can further support the particular importance of the Ljubljana Technology Park in terms of motivating, enterprise tradition, and the equalisation of existing and generation of new environments, where the incubator function for spin-off companies from the research and industrial spheres is one of the more important activities.

The Ljubljana Technology Park is breaking new ground in our region in the area of fostering technologically advanced enterprise. The results achieved, together with the list of initiatives from academic and industrial environments, demonstrate the success of the preparatory period and the correctness of the path chosen.

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- Some Links:
 - Spin-Off studies
www.jrc.es/
 - Spin-Off Advisors: Providing Independent Research, Consulting and ...
www.spinoffadvisors.com/
 - Office of Research: Technology Transfer: Creating a Spin-Off
www.techtransfer.fsu.edu/spin.html
 - National Research Council spin-off signs exclusive worldwide ...
www.nrc-cnrc.gc.ca/newsroom/news/novadaq00_e.html
 - Spin-off Companies
www.uts.edu.au/research/techdev/spinoff.html