

35th IASP World Conference  
on Science Parks and Areas of Innovation 2018  
Isfahan, Iran

**Parc UPC: pushing entrepreneurship for a successful innovation ecosystem**

*Plenary session 6:*

*Entrepreneurship for growth and sustainability in STPs and AOIs*

*Author:*

*Elisabeth Jordá Llosada*

*Hosted by:*



ISFAHAN  
SCIENCE & TECHNOLOGY TOWN  
(ISTT)

# Parc UPC: pushing entrepreneurship for a successful innovation ecosystem

## Executive Summary

Entrepreneurship, in all its dimensions and its variants, constitutes one of the main elements of the innovation system. In this regard, Parc UPC has established support mechanisms for entrepreneurship, that improve the innovation ecosystem, and contribute to social and economic development of the country. On the one hand, Parc UPC, as a university science and technology park, has all the elements of the value chain of entrepreneurship related to business creation, and it has worked and must continue to work in developing entrepreneurial skills programs for university students, accompanying them throughout the process of project development and company creation, and incubating their companies in a favorable environment for their growth. On the other hand, the high concentration of knowledge, technology and innovation generated by both the start-ups and spin-offs located in the park, and generated by the research groups and centers, are very attractive to undertake corporate entrepreneurship activities.

## Introduction

Jackson B.D.J 2011<sup>1</sup> defines an *innovation ecosystem* as “the complex relationships that are formed between actors or entities whose functional goal is to enable technology development and innovation.” He continues, “The actors include the material resources (funds, equipment, facilities, etc.) and the human capital (students, faculty, staff, industry researchers, industry representatives, etc.) that make up the institutional entities participating in the ecosystem (e.g. the universities, colleges of engineering, business schools, business firms, venture capitalists, industry-university research institutes, federal or industrial supported centers of excellence, and state and/or local economic development and business assistance organizations, funding agencies, policy makers, etc.).”

The innovation ecosystem comprises two distinct, but often separated economies, the research economy, which is driven by fundamental research, and the commercial economy, which is driven by the marketplace. So, is in this item where University Science and Technology Parks like Parc UPC tightly linked with the knowledge and Technology transfer model of the university, have the commitment to bring these economies closer

Therefore, the fundamental research is a necessary ingredient for the development of transformational innovations that have potential for impacting economic growth and also we must add it to the training in entrepreneurship and the development of entrepreneurial skills as one of the indispensable elements in the innovation ecosystem.

1 Jackson, B.D.J., 2011. What is an innovation ecosystem?, Washington DC. Retrieved from [http://erc-assoc.org/sites/default/files/topics/policy\\_studies/DJackson\\_Innovation\\_Ecosystem\\_03-15-11.pdf](http://erc-assoc.org/sites/default/files/topics/policy_studies/DJackson_Innovation_Ecosystem_03-15-11.pdf)

We have analysed the main elements of an innovation ecosystem and we have realised that the entrepreneurship is a strategic element in the innovation ecosystems (figure 1.1).

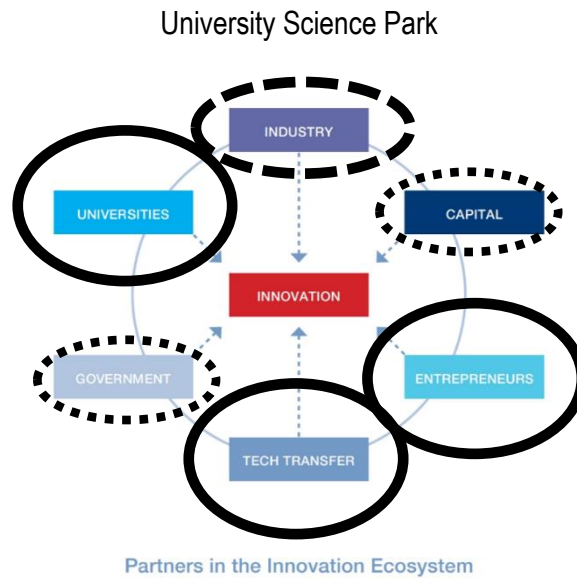


Figure 1.1

Therefore, we must consider how each and every one of these elements of the innovation ecosystem are implemented in our environment. On the one hand, knowing the business fabric, its specificities and characteristics, knowing the public policies that support and are aligned with the generation and evolution of innovation ecosystems, and have access to capital, are three essential elements to be taken into account. On the other hand, and where, as a science and Technology park can influence more directly, it is in the university model and its positioning in relation to the transfer of technology and in relation to entrepreneurship. We must analyze what is the current situation of the territory in relation to technology transfer and entrepreneurship, identifying all the agents that act in these areas, what are their objectives and how we can establish win-win collaboration mechanisms to develop and favor more and better innovation ecosystems.

Focusing on the entrepreneurship, we must take into account the different types of entrepreneurship. Beyond entrepreneurship based on the creation of a company, we have to focused also in formulas such as corporate entrepreneurship, all linked to the need of innovation that society and companies require in the new technological era and the new knowledge economy.

A classic definition of entrepreneurship is “the activity of setting up a business or businesses, taking on financial risks in the hope of profit.” Regarding this definition, the most obvious example of entrepreneurship is the starting of new businesses. But, if we have a look to the entrepreneurial spirit we realize that is characterized by innovation and risk-taking, and is an essential part of the ability to succeed in an ever changing and increasingly competitive global Marketplace. Therefore, entrepreneurship goes beyond the creation of a company, and today is already part of the innovation process of large companies.

CEOs talk about growth; markets demand it<sup>2</sup>. But profitable or growth is difficult. When core businesses begin to flag, research suggests that fewer than 5% of companies regain growth rates of at least 1% above gross domestic product<sup>3</sup>. Creating new businesses, or corporate entrepreneurship, offers one increasingly potent solution. Companies that put greater emphasis on creating new business models grew their operating margins faster than the competition<sup>4</sup>.

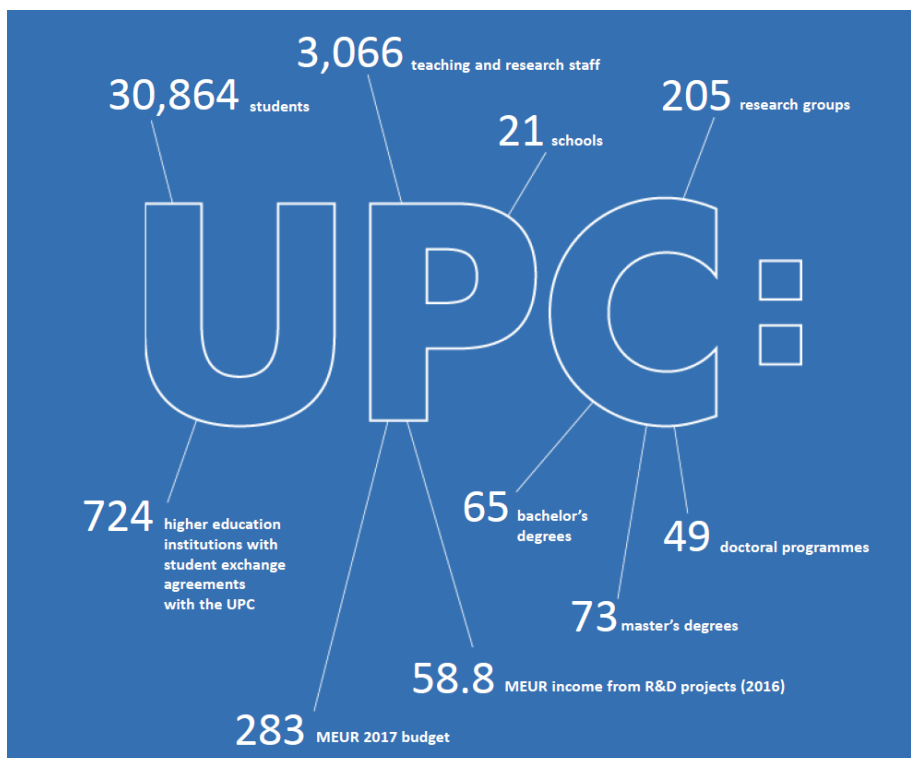
Therefore, taking into account the globality attributable to the term entrepreneurship, we must start by analyzing how entrepreneurship is treated from the university, what level of entrepreneurship is in our environment, what type of entrepreneurship exists, as well as the entrepreneur culture of our territory, to determine the strength of this pillar of innovation as well as to determine which strategies and actions to implement in the short, medium and long term to enhance this value. And we can not forget to observe the environment and the productive sector.

## Analysis and Results

The study focuses the analysis on the characteristics of the University, in this case the UPC, and the entrepreneurial characteristics, and the typology of the productive fabric in Catalonia.

The Universitat Politècnica de Catalunya · BarcelonaTech (UPC) is a public institution dedicated to higher education and research that specialises in the fields of engineering, architecture and science. It contributes knowledge to increase scientific output, transfers its results to society and provides a network of state-of-the-art research facilities and technology valorisation services that place it at the apex of innovation and economic development.

Some numbers:



2. See, for instance, R. Gulati (introduction), "How CEOs Manage Growth Agendas," Harvard Business Review 82 (July-August, 2004).

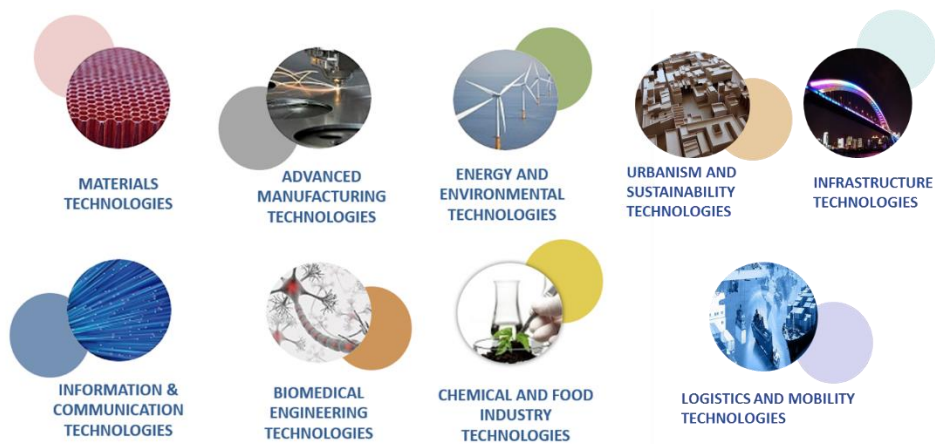
3. Corporate Strategy Board, "Stall Points: Barriers to Growth for the Large Corporate Enterprise" (Washington, D.C.: Corporate Strategy Board, 1998).

4. G. Pohle and M. Chapman, "IBM Global CEO Study 2006: Business Model Innovation Matters," Strategy and Leadership 34, no.5(2006)

The UPC knowledge areas are:

- Aerospace Engineering
- Applied Sciences
- Architecture, Urbanism and Building Construction
- Biosystems Engineering
- Business Management and Administration
- Civil Engineering
- Industrial Design and Manufacture
- Information and Communication Technologies
- Environment, Sustainability and Natural Resources

Due to these knowledge, the main UPC technologies are:



And the scopes of application are:

- Aeronautics
- Automotive
- Finances and Insurances
- Food
- Health
- Industrial systems and process
- Public Administrations
- Railway
- Smart cities
- Sport and Leisure
- Textile
- Tourism and Commerce
- ...

UPC is also a university committed to the socioeconomic development of the territory, and for this:

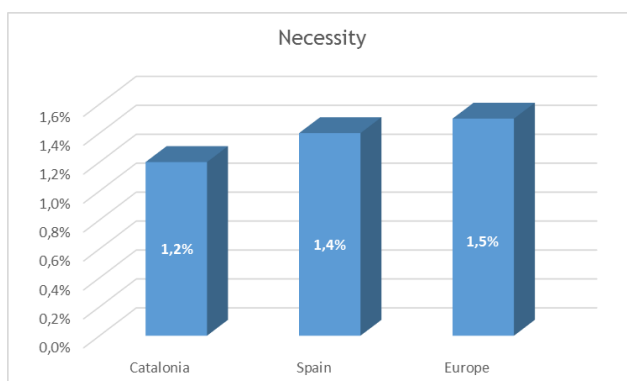
- UPC puts the university research capability of the 200 UPC research and technological transfer groups at the service of the innovation in businesses, and deals with their technological needs, providing an integral and multidisciplinary technological service, thereby supporting the enterprise innovation.

- UPC offers spaces, technological infrastructures and added value services fostering the use of synergies between research agents and companies.
- UPC deals with the research and technology transfer activities of the researchers. It features as the valid and direct interlocutor for companies willing to innovate jointly with the university.
- UPC boosts and facilitates the protection, valorization and transfer of its research results. UPC brings its research and innovation closer to those who need it, executing the most suitable option for each need.
- UPC offers incubation spaces and boosts Entrepreneurship for UPC students, graduates and researchers.

Catalonia is a territory with a lot of culture and entrepreneurial capacity. The history of our land, and going back to the feudal era (IX-XV centuries), created a society with an important value for the effort and the consequent reward. Thus, today Catalonia is one of the regions with great capacity and enterprising spirit.

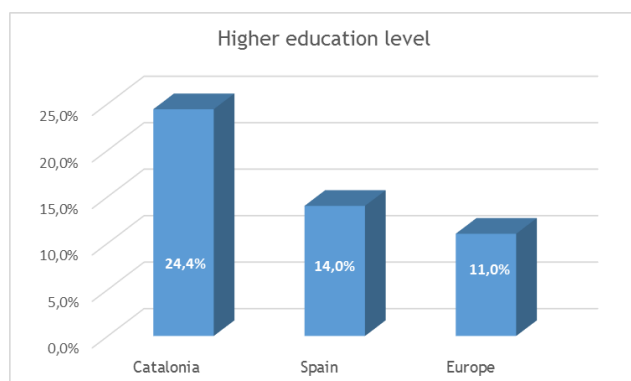
The Entrepreneurial Activity Index (TEA) places the volume of the adult population that is involved in initial entrepreneurial activities at 6.42%.

The decision to create a company depends mainly on three factors: opportunities, skills and economic and sociocultural factors. Based on these three factors, a study conducted by the GEM (Global Entrepreneurship Monitor), indicates that Catalonia is in line with the economies based on innovation,



and combining the two factors, it is above the European average.

Another parameter to consider is the level of education of entrepreneurs. In this sense, Catalonia stands out as the region where there is a greater number of entrepreneurs with a higher level of education.



Regarding the average age of the new entrepreneurs, this is between 38-39 years, but the highest rate of entrepreneurs, 7.4% resides in people between 19 and 34 years.

Regarding gender, the level of male entrepreneurship is still higher than the female level, although in recent years the distance between the two has been decreasing.

These and other indicators allow us to have a knowledge of the reality of our environment and power, as a university science and technology park, establish timely measures to get more and better companies that constitute one of the key elements of our knowledge and innovation economy.

So, we are in an environment with a high quality entrepreneurship, justified by the success of the projects in terms of their survival and consolidation index, but in which we must continue working to increase this quality of the entrepreneurship, since this will improve the viability, competitiveness and size of new companies.

Another important aspect is the situation of the productive fabric and its characteristics.

According to the Annual Report on the Industry in Catalonia<sup>5</sup>, the Catalan economy maintained its growth (3.5% in 2015 and 2016). This rate was three tenths higher than in the whole of Spain, more than double the euro zone (1.7%) and the highest in the series of Catalonia since 2006. The Catalan GDP during 2017 slowed down throughout the year, as it began with a growth of 3.8% during the first quarter and ended with a 2.8% in the fourth quarter, but it ended with a good data.

The weight of industry in the Catalan economy Industry (including extractive and energy) increased its weight (one tenth) in the whole of the Catalan economy in 2016 as its VAB increased more than the total. If the manufacturing industry is exclusively considered, its weight remained stable at 17.4% of the total Catalan GPD.

The observation of the annual data of the VAB shows that Catalan industry experienced the highest growth in the last six years, with 4.0% year-on-year, well above the Eurozone (1.6%). and 1.6 percentage points higher than the VAB of the whole of Spain (2.4%).

Industrial production index (IPI) grew 3.3% during 2016, the highest level in six years. This recovery in production was double that of all of Spain (1.6%) and higher than in the Euro zone (1.4%).

5. Informe anual sobre la indústria a Catalunya 2016 © Generalitat de Catalunya Departament d'Empresa i Coneixement Direcció General d'Indústria. Juliol 2017.



Every system has an optimal point that gives the system maximum functionality. In this regard, if we were to draw the population pyramid of companies of the Catalan and Spanish business ecosystem, we would realize that it would be defined by the following characteristics: have an extensive base of micro-enterprises and, at the same time, a tiny band in the middle of the medium-sized businesses.

Indeed considering the data published by IDESCAT regarding the year 2017, of a total of 619,419 companies and establishments based in Catalonia, 94.57% of them would conform the segment of microenterprises, 4.15% the segment of small businesses, 0.97% the segment of the medium, and finally, 0.31% of large companies.

If we were now benchmarking with the business pyramids of the countries that practice more business innovation, according to the statistics collected in the European Innovation Scoreboard of the European Commission, we could agree as a diagnosis, that our business fabric would be overweight in microenterprises, smaller companies would no longer have a significant role in the pyramid, and it would be better for Catalonia to have more medium-sized businesses

Finally, it is interesting to take into account the type of environment in which the park is located in terms of attraction, since there are multiple elements, but one very important is how attractive is the environment for attracting talent and investments. In this sense, according to the report of the Barcelona 2017 Observatory, Barcelona wins six positions and is ranked number seven among the top ten in the world. In urban safety, it improves and occupies the 13th place. While the city can boast of occupying the eighth position in the global areas of foreign investment. It is preceded by London, Shanghai, Hong Kong, New York, Paris, Sao Paulo and Sydney.

Other chapters in which Barcelona scores well are in sustainable mobility (fifteenth in the world); innovation (number 13 in the world and fifth in Europe); in scientific production (15 in the world and 5 in the continent); or in organization of congresses and number of delegates, where it occupies the third place in the world. The report also underlines that in terms of prices and costs, the price of offices is in the low range compared with those of other European cities, and in logistical land it's in the middle range.

In addition, the report highlights that the number of companies in the city grew 2.1% in 2017, and reinforces the challenge of making Barcelona "a great beacon in southern Europe in innovation, science and technology".

The new edition of the report 'Startup Ecosystem Overview' indicates that Barcelona is consolidated in the ecosystem of start-ups, the 'hub' of the Catalan capital is the first of Spain with 34% of innovative companies, two points more than in 2016. The Catalan ecosystem attracts at present, with corresponding figures 2017, 58% of the investments that arrive in Spain and consolidates itself as the fifth European city in the innovative ecosystem just behind London, Paris, Berlin and Dublin.

This observation and analysis exercise shows us, how the UPC Park can contribute to the economic and social development and growth. It helps us to define what activities and actions are necessary to generate an innovation ecosystem that adds value to the Catalan territory, and that also has a positive impact on the university, positioning it as an excellent university well aligned with the new global economy.

## Conclusion

In conclusion, the analysis confirms that Barcelona and Catalonia is a favorable site to develop and improve entrepreneurship and entrepreneurship activities, and that if we added a polytechnic university with the high educational and research level as the UPC has, we have the ideal conditions to generate a great innovation ecosystem.

The entrepreneurship and the technology transfer, both are the pillars for the creation of NEBTs and for the value relations with enterprises, and so they are the key issues to improve our innovation ecosystem. As we have been doing the last thirty years, we have to keep on working to evolve and redefine our technology transfer model with an important focus on how to improve and foster the entrepreneurship. A linear temporary evolution of the facilities for research management and technology transfer in the UPC is presented here (see figure 1.2),

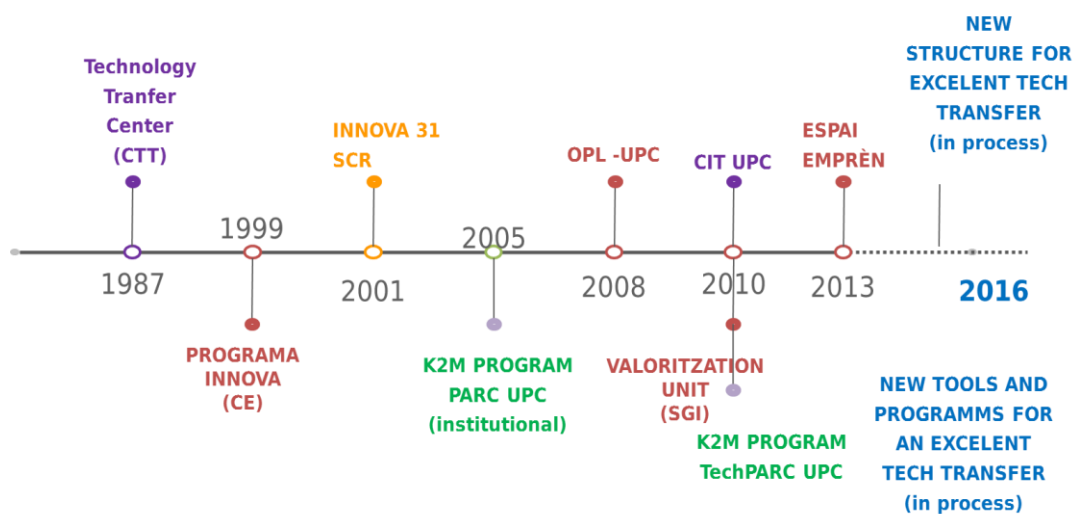


Figure 1.2

but we need to reorient our focus, because the new paradigm of the Open Innovation and the importance of obtaining applications of the university research and from the entrepreneurs to solve business and industrial problems and develop social innovations, make technology transfer function very important and force us to create a new structure for excellence tech transfer and develop new tools and programs to ensure an efficient relation between researchers and companies. (see figure 1.3).

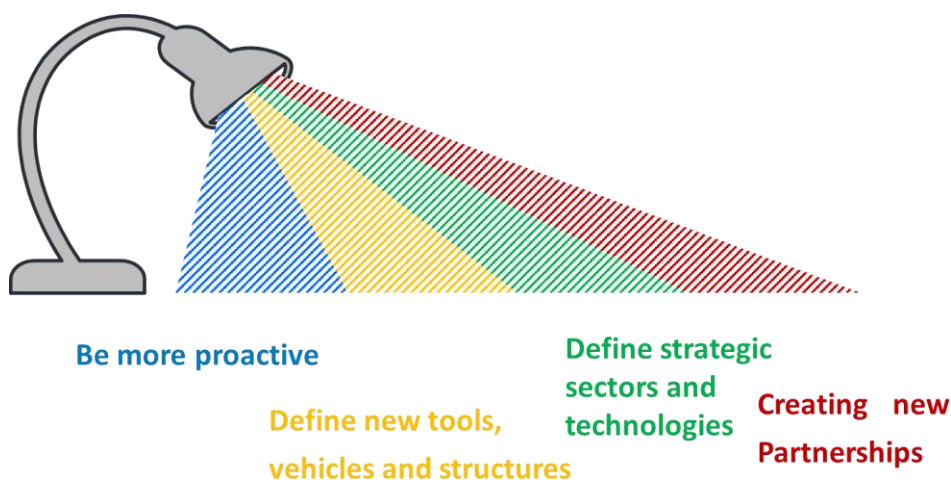


Figure 1.3

With all this, we have established five main issues:

**1. The collaboration between the university and the companies**

We have defined different programs to foster the tech and knowledge transfer. They are programs basically based on open innovation, where we put the UPC capabilities and all the UPC research knowledge available for the enterprises. The main ones are; diagnosis programmes of the technological situation of the company and proposals for the improving productivity, encouraging research through the integration of UPC scientific and technological capabilities. The offer of labs and scientific equipments to promote open innovation and an Industrial Doctorate Programme that fosters the linking between research staff and companies in order to develop research projects.

**2. The talent**

It becomes necessary to implement Internship programmes, development of graduate tailor-made courses for companies and programmes of identification of talent through real projects of the company.

Attracting talent through educational cooperation agreements through apprenticeships at companies or the development of Bachelor or Master's Thesis in topics of common interest and defined by the company. Scholarships Programme for students developing part of their Master or Graduate training programme in collaboration with the company and under supervision of an external tutor. And also we offer some forums to connect companies with last-year students and alumni.

**3. The infrastructures**

With this new model, physical infrastructures have taken a back seat. They are still important, but the activity and objective of the Parc UPC is no longer the occupation of spaces, and we have moved on to what we have called 'intelligent spaces'. Obviously, we have to be able to offer the companies the kind of space that they need, and we still working on it, but now is more important for us to offer the companies spaces where things happen, spaces with content and value for companies.

**4. The net and partners**

The SMEs have two main objectives in their first years, get financing and clients. We are working in this aspects to help them, so it's important to involve them and offer to them accurate nets in where they can find them. And this partners in different areas have to be national and international, so we can open the possibility to the SMEs to explore new markets and find synergies and collaborations with global partners to fight in this global and competitive world.

**5. The entrepreneurship**

Is the last issue but for us it's maybe the most important. Entrepreneurship has been an important issue in our university since 1998 where The Innova Program was created becoming the first university program in Spain focused on the spin off creation. Under the Innova Program, about 10 spin offs have been created every year. Furthermore, we have a far tradition and entrepreneur spirit in our university and in our country that has been the embryo for the creation of multiple start up, turning Barcelona into one of the best entrepreneurship hubs of Europe. Entrepreneurs "want to live where the action is" that is, in places where other young people, social activities, peers, and entrepreneurs are located. Entrepreneurs look for conventional startup support, such as mentor networks or role models, as well as nightlife, meetups, social activities, and other potential "collision" points, a combination best provided by innovation cities.

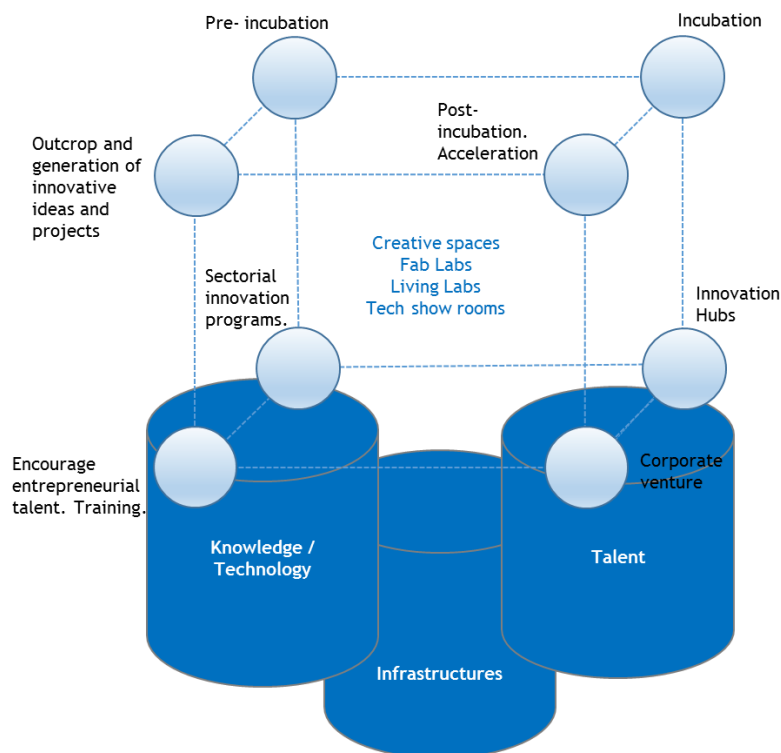
Therefore, we have defined programmes for the development of sector, technological entrepreneurship projects, for the incubation and mentoring of new business ideas and innovative projects: like Espai Emprèn, a new initiative that we are replicating in the different sites of the Parc UPC, LET- Technological Entrepreneurship Lab Programme for the UPC-Industry bilateral development of technological entrepreneurship projects in pre-seed phase of an idea in order to become a company project, and Sector Technology Incubation Programme, bilateral

UPC-Industry development of Corporative Incubation of Technology Entrepreneurship projects in the sector of interest of the company at an advanced stage of development.

Access to a broad portfolio of patents and to investment forums of the best start-ups generated by UPC.

In the end, we have created a network of core research facilities that play a prominent role in innovation and development, to turn ideas into reality.

These five main issues lie on three main pillars which are the base of UPC park; Knowledge and technology, talent, and infrastructures (\*). And around them we build intelligent spaces at the service of the community, as well as a set of key elements to support the activity and vocation of the Parc UPC.



Starting with the training in entrepreneurship skills, continuing with the programmes focused on the outcrop and the generation of innovative projects, and adding with the support at the pre-incubation fase, incubation, and post incubation, plus the relations with corporates and the generation of innovation hubs, Parc UPC has a complete map to help and improve the results of the entrepreneurship. Indeed between the 80 - 90% of the Spanish start ups located in UPC park are created and leaded by an exalumni of the UPC.

This confirms that the work done by UPC park and UPC, with the help of the culture and environment, is giving good results, bust its important to go on working estimating entrepreneurial talent from the early ages, continue with all this value chain, and put an extra effort to achive a new objective that is to set the UPC and the UPC park as the best technology partner in the corporate entrepreneurship.

(\*) infrastructures include not only the buildings, also the technology equipment, laboratorios, etc.

The Innovation ecosystems have to run like a coral reef for start-ups. In the ocean, a reef provides a structure that protects fish, provides food, and creates an arena for marine plants and animals to live and thrive. Likewise, Innovation ecosystems bring together new companies, experienced business leaders, faculty researchers, government officials, established technology companies, and investors. This environment provides those new companies with a wealth of technical expertise, business experience, and access to capital that supports innovation in the early stages of growth, boosting the social and economic development of the countries.

The rise of technology startups in cities is leading to new sources of employment and economic growth by creation of new businesses and employment categories, so the Technology university of Catalonia (UPC) and Parc UPC has the commitment, and it's what we are doing, to work closely with the city of Barcelona to contribute at the development of the global Innovation Ecosystem by providing knowledge, technology and talent.

Parc UPC, is part of the Barcelona Innovation Ecosystem and has a key role in the success of this important and strategic city project. But we can't forget that in our global world, projects have to be global or they won't be anything, so Parc UPC has to be part of the global world innovations ecosystems and has to play and collaborate with all the world wide innovation partners.