



The ecosystem of innovation

PEDRO NUENO

Catalonia is a modern country today. Compared to the rest of Europe, the level of its universities and its health system is good. Its industry is reasonably competitive. Even its infrastructures, despite legitimate claims to improve them considerably, abide by European standards, for good and for bad. Nevertheless, due to historical and political reasons we are not going to discuss now, Catalonia has an evident lack of big global companies. Although the level of innovation in Catalonia is close to the European average, Europe's leading regions are way ahead. However, it should be possible to correct this situation. Here the businesspeople should take the leadership. Public administration is expected to set a favourable framework, but in a largely diversified economic setting as is Catalonia, it is up to private initiative to give more priority to innovation for its own benefit.

The practical result of innovation

The practical result of innovation is a new or considerably improved product (good or service) or process. Technology, according to the best definition I found, namely that by Edwin Mansfield, is the available knowledge in society applicable to industrial arts (including here services). We may be able to develop a vast amount of technology without ever obtaining anything useful out of it. When we apply technology to existing industry and services, the result is innovation. Not all innovations are appreciated by the market. This is the ultimate check. If the market values this innovation, the company having introduced it will have market share, money, prestige and solidity.

At the start of last century there were electrical cars. A hundred years ago, somebody thought that motor cars would be electrical. For a century they have been running on explosion engines fuelled by oil derivatives. Today we are thinking again of running them on electrical power and most car manufacturers have announced prototypes based on rechargeable batteries, hydrogen or even oil derivatives producing power to run the car on that energy. The technology exists, it has become an innovation, but it has not yet been used to take on the market seriously.

Technology is the available knowledge in society applicable to industrial arts (including here services).

Innovation is the basis for business sustainability but it is a double-edged sword. In the 1920s RCA was the leader with radio sets, then with record players and records, later with TV sets, followed by video players, but then the logical step was small computers and RCA became history. In the 1970s its chairman, Mr Sarnoff, funded two university chairs, one at Harvard Business School

and the other at the MIT. This was a historic innovation. His message was that technology needed to go along with management to lead to business success. However, his company failed to follow this concept in the years after.

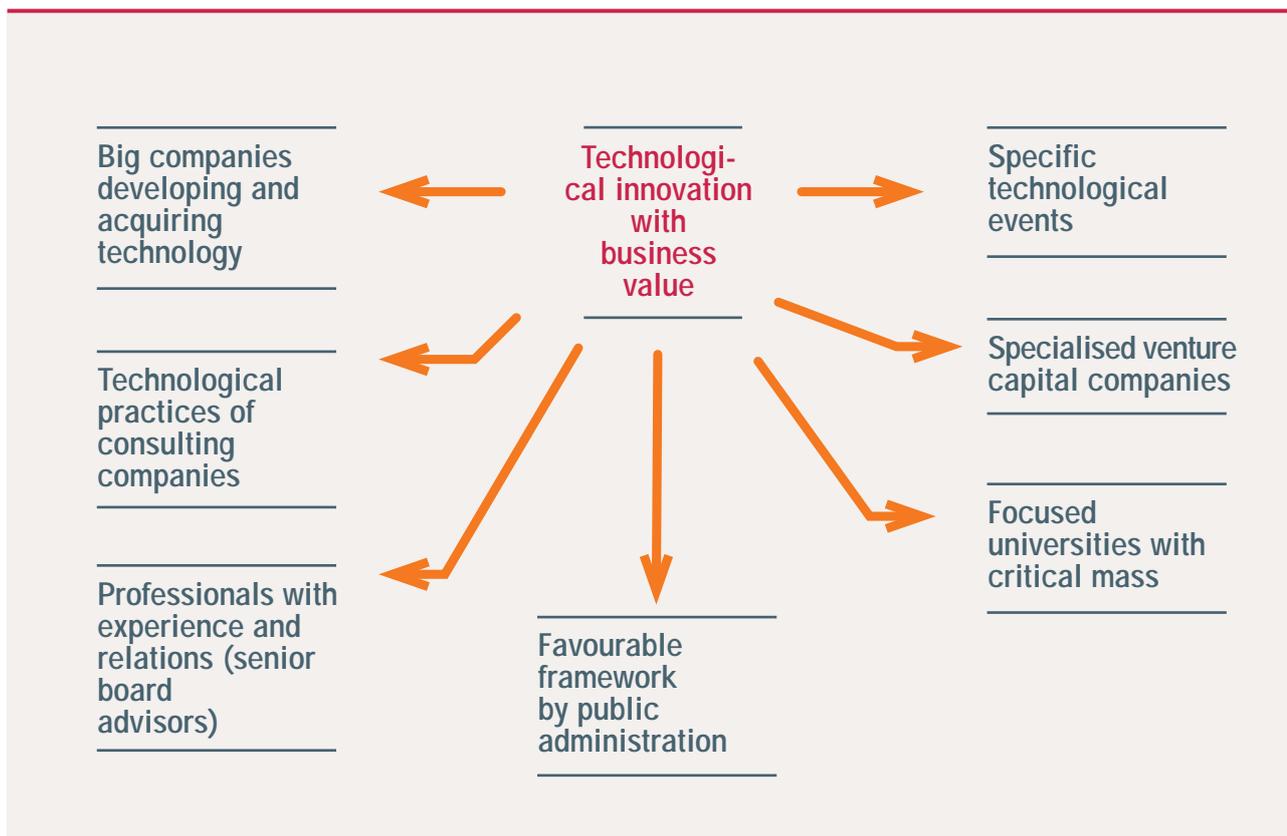
RCA did not live to its hundredth anniversary despite its enormous capacity to innovate and its excellent management but other companies have done better. It was in 1900 when Mr Emil Jellinek, an Austrian car wholesaler, convinced the Daimler Motor company to develop an innovative car with front engine and to name it after his daughter, Mercedes. With this car, Daimler overtook the leading German manufacturer in 1900, Benz. In 1903 the Benz shareholders drove out Mr Karl Benz from management. In 1926 Daimler bought the Benz company. During the 2000s Daimler Benz finally overcame the bad management under its director, Mr Schrepf, thanks to its capacity to innovate in an extremely competitive industry that hardly forgives any error.

The ecosystem of innovation

The application of technology to convert it into business activity may be done in an existing company or be the trigger to create a new one, known as new technology-based company. This takes place in a peculiar ecosystem in which a set of different activities coexist and interact, as the following graph shows.

On the one hand there is knowledge, mainly developed at universities or similar institutions (hospitals, public research institutions). This knowledge is published in specialised magazines, presented in congresses, materialised in doctoral theses and in some cases (few in Catalonia) results in patents. The scarcity of the latter is due to the fact that researchers strive for a scientific, not a business career. They therefore do not care if

Graph 1. The ecosystem of innovation



▲ This ecosystem works in a given economic, cultural, legal and administrative framework

their knowledge is used by others as long as they are mentioned, which is legitimate.

On the other hand, there are events (congresses, exhibitions, professional meetings) in the ecosystem where progress in the area of knowledge is presented and representatives of the other inhabitants of the world of technological knowledge in that industry attend. These are events that attract the most outstanding people in that field, so the degree of specialisation is considerable.

Other inhabitants of the ecosystem are venture capital companies, particularly specialised ones. These companies help to convert knowledge into business and cover the most uncertain stage of the project. Once the innovation has proven its

feasibility on the market, big companies usually show their interest. The relation between pharmaceutical giant Novartis and small Speedel allowed both to develop the Tekturna drug for controlling hypertension. This earned them in late 2007 the first prize for innovation in competition organised every year by The Wall Street Journal. Novartis finally bought from Speedel the rights to sell the new drug in the United States.

The ecosystem obviously requires big companies. They are the ones hiring the best professionals, collaborating with universities, attending events, generating the capital gain venture capital companies need, while maintaining internally a powerful research process that lies at the heart of all this. It is therefore logical that big companies

tend to locate their research close to their headquarters, although it is becoming more frequent to relocate it in areas with attractive resources: access to leading centres, first-class scientists at a good rate, abundance of start-ups. It is thus normal to see R&D moving increasingly to China (especially Shanghai) and India as well as many companies having R&D centres in the Boston or Los Angeles area.

Other inhabitants of the ecosystem are the consulting companies and experienced (sometimes even retired) professionals. Consultants can assist in transforming ideas and knowledge into business projects and can sometimes serve as an interface between different inhabitants of the ecosystem. A similar role can be taken by people with experience and contacts in an industry that may help scientists and entrepreneurs to consolidate their ideas. As advisors, they can give credibility to innovating projects and guide them along the correct way within the ecosystem (towards a big or venture capital company).

The application of technology to convert it into business activity takes place in a peculiar ecosystem in which a set of different activities coexist and interact.

All this ecosystem works in a given economic, cultural, legal and administrative framework. One thing is the Zhangjiang Hi-Tech Park in Shanghai, another thing is Silicon Valley and something different are the 22@ district and the Vallès Technology Park in the Barcelona area. Benjamin Krempel is the manager of Aqueduct Medical, a San Francisco company that manufactures a medical device for people having undergone surgery after trauma or aesthetic surgery. The device allows to drive out the heat of the skin without the use of ice. It is effective, comfortable and lasts as long as is needed. Working in San Francisco means living with venture capital companies or business angels. Working in the US medical in-

dustry means passing the tough approval processes by the Food and Drug Administration (FDA). But especially working in that country means having a large homogeneous market from the day a product can be sold. Probably an innovation like Benjamin Krempel's could only become a thriving business in that particular setting because the ecosystem is favourable for «organisms» like Aqueduct Medical.

How does the ecosystem in Catalonia work

Our ecosystem to convert technological intellectual into economic wealth is weak. The knowledge ingredient is reasonably solid. The events ingredient is abundant, in some industries more than in others, but it is somehow generalist and does not manage to attract some of the key inhabitants of the ecosystem as, for instance, venture capital companies. The big companies ingredient is notably weak. Catalonia hosts few headquarters and some being here have a very limited decision-taking capacity in general, particularly in the field of creating new business activity through innovation.

The consulting ingredient is reasonably solid and would be able to take its expected role in this field if it was matched by other ingredients. As to experienced professionals, the situation is irregular and depends on each industry. Catalonia has been outstanding for a long time in some areas (from car making to advertising) and it is here where such professionals can be found. The ingredient lacking most is that of capital ready to become involved in the different stages of innovation.

The lack in this area is very big. As to the «favourable framework by public administration» ingredient, it is possible to find better ones – either in general or by industries – in different European or even fellow Spanish regions.

What can be done?

First and foremost, strengthening the ecosystem. Keeping and doing anything to go on improving the university setting, one of Catalonia's biggest assets. In this field the strategy should probably be quite horizontal in the sense of not driving for one single area. University is a very long-term investment so no discipline should be excluded or pushed above others.

Our ecosystem to convert technological intellectual into economic wealth is weak. It is therefore recommendable to cultivate our ecosystem, protect and strengthen it, to fill it with business.

As to all other elements of the ecosystem an analysis is necessary to set priorities and make gradual progress. Barcelona hosted the international mobile meeting recently. It is one of the best attended and renowned events of the world in this industry. But only about thirty local companies were fully engaged. For them, the event is great.

However, it is highly probable that, at the end of the day, the largest value input of the event to our community comes through tourism rather than through creating a larger business base thanks to the contribution of the event to the ecosystem. The reason is not to be sought in the event nor in local companies, which for sure are to be considered heroic – the reason lies in the poverty of the ecosystem and the resulting fact that one single ingredient, no matter its strength, does not yield results.

It is therefore recommendable to press on and manage to cultivate our ecosystem, to protect and strengthen it, to fill it with business. This is everybody's task. Public administration needs to create the ideal framework, private initiative needs to

exploit it ambitiously and university needs to work as it has so far and improve its ways whenever possible.

And in the meanwhile?

Meanwhile, there is something we can do about it. I call it building long bridges. It is not easy but in Catalonia we have individuals, institutions and companies, sometimes too discrete, having forged with their work and prestige some privileged relations in other places of the world in every ingredient of the ecosystem. We have doctors, businesspeople, academicians, statesmen and other professionals with international prestige and contacts. We have modern institutions such as chambers of commerce and business associations that can become a solid local base for these bridges and even a player to build them. We have some public agencies with building capacities such as CIDEM and COPCA, just to name two of them. We have of course our universities, their specialised institutes and management schools. All these players help us build these bridges and lay the local foundation to them. Through these bridges can come those inhabitants of the ecosystem who live not here or the local businesspeople can go and bring them over.

We often see trips and missions of different groups visiting ecosystems rich in opportunities and those ingredients that made them a solid business base: Ireland, Finland, Bavaria, Silicon Valley, Boston, Shanghai, Dubai. But we go there, come back and then, if we need something we saw there and we do not have here, we often do not know whom to call because we did not build the bridge. We liked what we saw, we understood why it is successful, we identified all our shortcomings but we did not build a bridge through which those great resources become part of our opportunity and help create wealth.

We cannot expect public administration to build these bridges. The most we can do, if we do not

set out any, is to ask for support: a favourable framework, a concession for a toll bridge?

The HIT-Barcelona event on innovation and ICT, for instance, intends to be a new bridge through which ideas, opportunities and venture capital reach out to some industries with a high potential in our country. The Spanish and Catalan governments, the Barcelona city council and chamber of commerce, among other institutions, have engaged to build it.

The Farmaindustria proposals to keep the pace of the innovation engine in our country, in words of its director general Humberto Arnés, intend to keep alive a crucial element of the pharmaceutical industry, namely strong local companies able to create a global solid economic base out of our country by means of innovation. We have examples of drivers like Almirall, Grífols and Esteve that are successful in the global scene. Technology parks set up with private initiative like the Pla de Bages one are a solid foundation of a bridge set

out in detail to facilitate the creation of wealth based on innovation. Likewise, the development of the 22@ district, the Vallès Technology Ring and the support to innovation project by the Barcelona chamber of commerce are examples of the many ideas put into practice in our country to cultivate the ecosystem and link it with more powerful ones.

Reality shows that we can be optimistic. However, behind many such initiatives is a heroic, perhaps too discrete leadership. Our society should better know what is out there and maybe value it better. We probably need to disseminate some data: quality jobs created through innovation, for instance. Perhaps we should acknowledge those who build bridges or lay solid foundations. We probably ought to go through the administrative (labour, tax, regulatory) framework our ecosystem of innovation lives in, compare it to others generating more live and see if we can improve it.

We can still get there.

PEDRO NUENO

Full professor at the Bertran Foundation for Business Initiative chair at IESE. Doctor of Business Administration at the University of Harvard and Industrial Engineer at the UPC. Executive President of CEIBS (China Europe International Business School) in Shanghai.

