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MAIN SUBJECT

INNOVATION SYSTEM OF SWEDEN

The Cluster Phenomenon Is Here to Stay



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You were one of the founding fathers of VINNOVA...

Not really but indeed I've been part of the management of VINNOVA during almost all the period it existed and up to now, and I've been in charge of developing quite a few innovation programs that VINNOVA today has. To some extent I have really been in the heart of the developments working very closely with our first Director General Per Eriksson who is now vice-chancellor of the Lund University. Right now I'm also a coordinator for research and innovation within the EU Baltic Sea Strategy Action Plan in which capacity I'm very much involved in discussions on innovation not only in Sweden but in the whole Baltic area. Russia is also a part of it, and it is my hope to see a more close collaboration with Russia on innovation within the Strategy. It has started with one project right now, the one on water-cleaning technologies: a world-leading consortium is being built with participants in different countries around the Baltic Sea. Vodokanal company from Saint Petersburg is one of the partners in this project and some of new water-cleaning devices will be developed and tested with their support. This is the first project that Russia will be involved in and we hope that Russia will take part in more projects in the future.

Comparing to other countries' innovation systems what makes the Swedish innovation system special?

There are some very specific characteristics. One is that we have several huge multinational companies operating in sectors where research is a precondition of being competitive

like pharmaceuticals or telecommunications. This means that they are focused heavily on R&D in their business. And that is basically the reason why Sweden tops the world chart of countries investing in R&D. Investment in R&D in this country stands at about four per cent of GDP and 75 per cent of this figure come from 10 to 20 large companies.

The second characteristic is that we have a relatively small research institutes sector unlike other countries where big research institutes work very closely with industries. In Europe only Switzerland has a research institutes sector as small as in Sweden. Consequently it is expected – both by the government and the public, that this role must be played by universities which is quite unusual compared to other countries. This was reflected in government regulations for the universities adopted in 1997 where the universities were given a third mission. The first two were education and research; in addition the task was set for them to support and to work closely with the society and with the industries.

Another characteristic or rather a weakness of the Swedish system is that small companies do not invest enough in research. We are struggling with that. We are trying to encourage smaller companies to invest more heavily in research, to get more and more small and medium-sized enterprises connected to the research network and innovation system, to encourage them to be more innovative, to develop new products and also to increase their knowledge. Obviously Sweden is not unique facing this type of problem and now we are trying to do something about it. And I was responsible for developing a special program "Research and Grow" addressing exactly this matter. It was inspired to some extent by the SBI (Small Business Innovation) program in the United States in the framework of which the US government supported small and medium-sized companies doing research. "Research and Grow" was exactly the program to fund R&D in smaller and medium-sized companies and it became extremely popular. With an annual budget of 120 million Swedish crowns the number of SMEs which want to apply is high, but only 10 percent of those who apply can get funding.

Within this system what is the role played by the government and government agencies such as VINNOVA?

The first thing that the government does is to secure an infrastructure of the innovation system: funding bodies for research in universities and research institutes, bodies that encourage cooperation between business and academia. This includes regulations for universities, for agencies like VINNOVA and all the intermediate organizations working

with government funding. Talking about VINNOVA we have a specific mission to fund such research which is carried out in cooperation with industry and business and to secure that the interactions in the innovation system really works. We support connection between business and universities, between business and research institutes and between research institutes and universities. Our task is also to support the commercialization of the research results. We as well underline that an information flow between universities and businesses goes in both directions, not only the classic way that is to take the result of research and try to commercialize it. It is not less important that the business needs for new knowledge and new technologies will be submitted to universities so that academic researchers understand and focus on the need for specific new knowledge, its future market merits and value. A working dialogue is needed between the business sector and universities so that research is inspired to be oriented towards needs of industry. If you do that it becomes much easier for the companies to use the results of R&D.

Does the government set some concrete benchmarks of what it expects the money it allocates to the research bring?

They do not set quantitative targets for us to fulfill. Instead they have given us a task to show that our work is important. What they are expecting is what we call "impact". We have to document that there is return on investment, to show that the industry has been able to be more competitive, to develop new products and to gain new markets, to hire new workforce and raise their competence as a consequence of our funding.

Do you feel innovation in Sweden needs a particular support from the government in form of specific legislation acts?

I would say that the restrictions we have in Sweden are not laws in proper sense of the word. The restrictions are majorly in minds, they are part of culture. What is really needed here is to develop a more entrepreneurial mode of thinking within the research system. As long as I have been in the system it continuously has been involved in discussions and sometimes in conflict between proponents of "pure research" for the sake of new knowledge and their opponents who insisted that the ultimate goal of the research should be improved quality of life which demands that research should meet needs of society and business and be utilized. These two camps have always been in debate, if I look back for some 30 or 40 years this discussion has been going back and forth. One decade more accent was made on utilization, and then the pendulum would go back towards more fundamental research.

How did VINNOVA contribute to the development of the Swedish innovation system?

I think we have done quite a few things that have really made difference. One thing is that we have strengthened cooperation between various actors in the system: not only businesses and academy are now working more closely with each other, we have also got the public sector involved in that, and political system too. During the last decade there has been a lot of discussion about the concept called "Triple Helix". By "Triple Helix" it was meant that the academy, the public sector and business leaders form some kind of common vision and common priorities. I must admit that in several areas we have been quite successful with that. I am especially satisfied to see how many Swedish regions where the Triple Helix approach is working now. Ten years ago the cooperation in regions was almost negligent to identify the

strong points of a particular region and to focus the research, innovation and business development in these areas of strength. Through VINNOVA we have encouraged a much closer collaboration between the business, the academy and the political structures of different regions. This in turn has helped to set goals for regional innovation systems, to develop a strategy for each region how they should most effectively use their resources to become more competitive.

Secondly, the already mentioned program "Research and Grow", which is a program for SMEs. I believe this program has also made a difference: large number of SMEs now are able to do research and up to 80 per cent of these companies have been able to develop new products based on such research. All of them have also developed links with the research network which did not exist before.

We have a concept at VINNOVA called "Strong research and innovation milieus". These are located either at universities or at research institutes. The major characteristic of these milieus is that they have multidisciplinary research teams working very closely with business, while their funding is divided in equal parts between VINNOVA representing the government, the industries and the universities themselves. At these milieus the entrepreneurs and companies can have a dialogue with the researchers, discuss the most important problems that researchers should address. I would say we have improved the skills in universities to cooperate with industry, helped them to understand better the business psychology and reasoning which all resulted in improved cooperation between the two. And I also think many companies now also understand better the academic logic and the researchers' way of thinking. This improved cooperation I think, was to a considerable extent the result of numerous programs that VINNOVA has worked out, designed and has been running.

What are the particular Swedish advantages that help develop innovation system here, and vice versa what are the major obstacles?

Sweden is a small country; this is both an advantage and disadvantage. The advantage is that we are very dependent on export which means that Swedish companies are competing with their foreign counterparts. To be in the global market and to compete successfully with the best companies is a very effective driver for innovation. Here in Sweden every company understands it has to develop, it has to improve, it has to acquire higher skills, to be innovative to stay in the forefront. The disadvantage is that domestic market is very small. If you compare us to bigger European countries like Germany, to say nothing of the United States, their small companies can develop comfortably in their home market alone. Swedish firms in order to develop must at some point go abroad which is always a tough challenge for smaller companies. Incidentally this was one of the ideas behind the Baltic Sea Strategy: to make the whole region a home market for the companies from the neighboring countries thus increasing the size of their domestic markets. Being involved in this cooperation project I see two important arguments in favor of this strategy. The first is that most countries around the Baltic sea are too small in order to be, in the long run, attractive and competitive actors globally, while combining competences of participants in neighboring countries would place them in much better and stronger position for competing internationally. The second is that all SMEs can enter and operate in a home market which is ten times bigger than their owns.

How long does it take to turn new ideas into innovations?

Sometimes you have to wait perhaps twenty years before all the fruits become evident. Some 15–20 years ago we started funding research of an issue which caused a big problem in the society – injuries in car accidents. Special attention was given to an effect of neck being broken as a consequence of a car being crushed into from behind. After years of medical and engineering research a company in Western Sweden started producing special safety equipment to minimize neck injuries in that type of accidents. The company name is Autoliv and now it's the world leader in this sector with turnover counted in billions and exporting their equipment all over the globe. It is very clear that the success of this firm was brought about by that research, and the insurance companies have models to calculate the economic value of this innovation. This was a very concrete example that can tell how much the society has gained from a research effort.

You know that universities have money to endorse research, fundamental research are also funded by research councils. The priorities of both are mainly traditional. If you go back 20–25 years ago the predecessor for VINNOVA saw very clearly that IT would be in future a most important field. However at that time the research in that field were scarce, nor were there adequate investment in education in IT. So VINNOVA's predecessor allocated money to support technical universities, to develop research, to train researchers and to prepare education programs in IT. Today it is very clear that the success of Ericsson would not have been possible without VINNOVA's predecessor.

A third example. In 1990s we started setting up a strategy to develop new renewable materials and products from wood to replace petrochemicals (plastic etc.). Today a number of small and larger companies develop new renewable and environmental friendly products from wood materials. And again the foundation has been put by VINNOVA and its predecessor in the form of a strategy and finance.

How did the role of science parks evolve as the time passed by?

The role of science parks has changed a lot with the time. Initially they were no more than some rented premises and office space. The idea however is that they are places where a number of companies may locate their R&D, launch start-ups exploiting research done by universities, and also where big companies as well may put their R&D departments or parts of them. It's a meeting place where people from different companies, large and small can meet, talk, exchange ideas and inspire each other thus making innovation process more efficient.

Apart from science parks there are also incubators which are now in high demand because they offer business assistance services which is crucially important for start-ups and early-stage companies. So around the universities you need to have several innovation support systems with different functions, and both science parks and incubators are parts of that. Also, as an example, at IDEON in Lund they have such a structure called Technopol where there are experts in many fields who could give professional advice. Also there is in Sweden an organization named the Innovation Bridge which also has a specific role in the innovation support system.

Science parks work differently in different parts of Sweden depending on how the innovation support system looks like and works in places where they are located.

In Stockholm, in the so called Kista Science City we have an incubator and business accelerator in the IT field called Sting (Stockholm Innovation and Growth). It supports the building of new global growth companies by attracting the best innovators and entrepreneurs, offering them world-class business development support and networks.

Also in the Stockholm there is Karolinska Development – an organization and a system initiated by Karolinska Institute to secure financing and support for the many innovations coming from its researchers. Karolinska Institute is one of Europe's largest medical universities and Sweden's largest center for medical training and research, and Karolinska Development together with Karolinska Institute provides access to world-class life science innovations. The management team contributes with senior R&D and commercial expertise which accelerate both product and business development. It employs specialists and project managers with solid industrial experience.

In Gothenburg the Chalmers Technical University and the Gothenburg University are developing a very interesting project with assistance from VINNOVA. They are creating a common innovation support system, called Golnn, aimed at commercialization of research. Its mission is to facilitate a shift to a knowledge-based economy. Specifically, Golnn shall work to support industry, academia and society as a whole to build wealth and welfare from early-stage innovation.

I also would mention Linköping. The university there is small but they work very professionally. And the fact that they have a marketing director at the university management speaks for itself.

What is your vision of innovation system in Sweden in 10–20 years?

That's a rather difficult question. I think the cluster phenomenon is here to stay. Ten years from now they will multiply in numbers and a much bigger portion of the innovation system will be organized in clusters which will include universities and the research centers as an effective means to utilize the research. I also hope that ten years from now a much larger portion of SMEs will be involved in R&D and develop contacts with the research network. The degree of products that have high knowledge content in the Swedish industry will increase and that also requires that universities and the research system cooperate more closely with industry. I think universities in the future will be more profiled: the percentage of universal knowledge universities will go down, they will be more focused instead on several priority fields, and the global competition will force them to prioritize. I think they will target these priorities in line with the needs of business infrastructure in the region where the university is.

So an alliance will be formed between the choice of priorities by a university and the needs of the business infrastructure around it. The funding of the universities has already started to change: what is now introduced is that funding of a university will be to some extent based on its performance. This has not been the case. Traditionally older Universities have had a good funding, while new younger universities enjoyed much less budget funding. We will progressively introduce a system where the government funding is distributed basing on performance so that every university will be keen to perform, to achieve results in accordance with a specific individual strategy set for this particular university. Putting the universities in a much more competitive environment will make the whole innovation system more effective.