INNOVATION TRENDS

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MAIN SUBJECT

INNOVATION SYSTEM OF SWEDEN

The Cluster Phenomenon Is Here to Stay

Sven-Gunnar Edlund – Senior Advisor, the Swedish Agency for Innovation Systems (VINNOVA), in 2004 – 2009 Director and Head of Division at VINNOVA

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 GoInn, aimed at commercialization of research. Its mission is to facilitate a shift to a knowledge-based economy. Specifically, GoInn shall work to support industry, academia and society as a whole to build wealth and welfare from early-stage innovation.

I also would mention Linkoping. 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.

Entrepreneurship in a Welfare State

Åsa Johansson – Director of Swedish Network for Innovation and Technology Transfer Support (SNITTS)

What is SNITTS and what is SNITTS' position in the Swedish innovation system?

SNITTS is a fairly new nationwide network, a non-profit organization of professionals who work with knowledge- and technology exchange. We are financed by VINNOVA and we have existed for two years now. The idea behind SNITTS was to create a national platform where members can build their knowledge, exchange experiences, develop methods and contribute to putting the agenda for knowledge and technology transfer. This field is relatively new in Sweden, and we need to develop knowledge and to learn know-how of the profession, to establish an innovation support system around the academies. So SNITTS is for all the people involved in technology and knowledge transfer, innovation support. Most of the people we are working with are from universities, others work in government agencies dealing with innovation support. Also there are people from industries, big companies, as well as from research institutes. Our goal is to encourage and help them mix with each other so that they could learn from each other. For that purpose we apply education, events, information and policy activities, run courses, conferences on fundamentals of technology transfer, licensing, etc; together with VINNOVA we work on establishing an international fellowship program providing international training opportunities to senior staff or experienced professionals who work with innovation and commercialization of academic research results at tech transfer offices or the equivalent at Swedish universities. We also stage a lot of discussion seminars for the professionals. So we are sort of a network platform for some 250 people who now can put together different interest groups, like a legal group, another one working with small and medium-sized companies, etc. We also have committees but they work internally for SNITTS like the one which deals with organizing those courses and conferences, looking at best practice and benchmarking. In other words SNITTS is a network for professionals supporting the ideas and innovations of tomorrow and the growth of companies translating scientific discoveries and innovative technologies into new products and services which leads to a vibrant innovation economy benefiting Sweden.

Generally speaking what are the specifics of the Swedish innovation system?

One special thing is that we have a "teachers exemption". It means that teachers' employers, unlike the rules which apply to other employer-employee relationships, cannot make any legal claim to the inventions of teachers unless special agreements to this effect have been concluded. This teacher exemption, while currently under review, has been seen as an important incentive for researchers to commercialise their research results. Some employees perhaps may feel encouraged to take their ideas to the market in the belief they are going to make "big bucks", but most people don't. In most cases the employees have neither knowledge nor desire to try their luck in the market, and even if we have a support structure for the employees at universities, there is no structure to commercialize their ideas when they don´t want to. It is a very individual driven system. It is quite a sensitive issue though, and half of those involved believe "teachers exemption" is good, while the other half argue that it should be abandoned. However as far as it stays it is a prominent specific feature of the Swedish innovation system.

Secondly our system is fragmented with lots of actors involved but working without a united innovation strategy, it is yet to be worked out. We spend a lot of money on research and we are really good in starting spin-off companies because universities do not own their IP (intellectual property, i.e. inventions of their own employees) and they cannot license it. So we are a spin-off country, so to say. However while Sweden is very much focused on creating spin-off companies, we are not so good at making them grow. Also traditionally Sweden's industrial policies and strategies have been targeted too much towards big multinationals at the expense of small and medium-size companies. It all began to change in the last two decades, especially in the last five years, and now the government has announced they are going to decide on an innovation strategy for Sweden based on European ones. So industry-wise, we are in the middle of a major transition from big companies to small ones who are the only ones with a real potential to grow in the future.

It also seems that what defines Sweden from other countries is a more visible role played by the government…

The government does not have a specific innovation policy, but they have now initiated the development of a national innovation strategy. In fact Swedish ministries are traditionally very small. Instruments which execute the government policies are agencies: we have some six hundred government agencies. If you take research funding agencies there are 27 of them compared to just one in Norway. It's a fragmented system but that's the way it is. It is different, it's not better or worse, it is just different, and it also depends on what country you compare it with.

Meanwhile agencies like VINNOVA are much more autonomous than agencies in other countries. We get sort of directive from the government but within those directives we can act pretty much we like. We also have a culture which makes Sweden an innovative country. We do not have a rigid hierarchy structure and the distances between higher management and employees are very short. In a sense it is what makes Sweden a rather dynamic country: we are fast

in making decisions. The drawback is that we also have a consensus culture where everybody has to agree before a step is taken. In the US, for example, you have somebody who takes the decision while in Sweden there should always be a group, a team to do it.

On the legal side did the government introduce any specific acts to promote innovations?

We don't have tax deductions for R&D; we don't have any tax credits… Of the recent moves there is a ruling that researchers have to report their invention. One thing that they are talking about now is innovation procurement under the Public procurement act: when you make a public procurement, part of the money should go to promote innovation. This program though has not really started yet.

What are the major driving forces of the innovation process in Sweden then?

Basically it is science: we are leading the world in the percentage of public money (some four per cent of the GDP) spent on research and development.

Compared to what it used to be ten or fifteen years ago how did the innovation system in Sweden change and what were the latest trends on this change?

First, I would say the government is playing a more and more active role in promoting innovations; twenty years ago it completely relied upon multinationals and the public sector, now it is different. Second, small and medium-size enterprises open more and more toward innovation and innovation management, and they are encouraged to do so. The government still does not have a specific innovation policy, but they have now initiated the development of a national innovation strategy. I hope it will improve regulations for small and medium-size enterprises as well. In the framework of this strategy a broader focus is now being developed on knowledge/technology transfer, not just "innovation". Education, research and innovation are now regarded and addressed together as "the knowledge triangle".

What hinders the innovation process here?

I believe a real entrepreneur will always find his way but we lack resources of venture capital. Besides, internal market is small: the bulk of what we produce we export. There also was a report on why do people start businesses in Sweden. It's not really to become rich, it's for other reasons: it's freedom to do what you like, freedom to realize oneself. These are different incentives than getting rich. And I would say we have a pretty large public sector, and, of course, that prevents a bit because competition in public sector is hardly a driving force. Add to this the Employment protection act which effectively slows down the job market: you cannot just pick up most talented and innovative cadres and promote them to the top positions, nor can you willingly get rid of bad employees. In Denmark for instance they have a completely different system of safety and security in the job market. In Sweden security means that once I have found a job I can keep it. In Denmark on the contrary it means that I can find other types of comparable job, so it's still safety and security but from different perspective. It makes companies much more dynamic, flexible and effective, and people move around between companies and academia to a much larger extent than in Sweden, here we don't have that mobility at all, and that's a drawback. What also hinders the innovation process is difference in culture between academia and the business world, there is a gap that we need to close. It is changing though, and changing surprisingly fast.

I also think as a nation we are a bit risk-versed, the question is not so much whether I'm scared of failure, but rather do I dare to try before I analyze it completely. A tradition at least for government agencies is before they start do something they do analyses, come to a conclusion, evaluate a project, implement a project, and that may take three years and you are late to the market. Now it is much quicker: in a couple of weeks after you decide on your framework just go out and try it, if it fails try something else. At VINNOVA the managing board no longer demands large reports to make decision, just one page, that's it. But you have to report much more often. We say we are very good at designing and engineering, we are pretty good at marketing and we are bad at selling – that's a Swedish culture.

How important are technological and science parks in Sweden?

They are very important. It was a major trend in recent years to promote science parks and incubators. If you take IDEON for example they have an innovation system of their own: they have incubators, the park, the university, researchers and they have companies around – all this combined make an innovation system. If managed properly and professionally it can be very efficient. Now more regions start building their smaller regional innovation systems. Also, I would say there is a trend of making science parks operate more like clusters. With our Swedish model where we put emphasis on creating spin-off companies and connecting universities and businesses, of course they are very important.

Kista Science City thanks to Ericsson's and other companies' presence is a valuable contributor to IT and Telecom development. It was transformed from a rural area via a military training ground into today's high-tech centre for Stockholm and Sweden active to create a close and profound collaboration between the business community, university/research and public sector players. With over a thousand companies, five thousand students and 1100 scientist in Kista Science City it is unique, and nothing of the kind exist anywhere else in Sweden. Uppsala Science Park is an important center of pharmaceuticals and biotechnology. They are huge now occupying 400 thousand square meters.

Looking to the future what do you think will be the major trend in development of the innovation system in Sweden?

I think we will get a national innovation policy and an innovation minister. I hope organizations will be better at taking care of the assets they got and that we get a more efficient knowledge transfer process. Now we serve two ministries – Ministry of Enterprise and Ministry of Education and Research, but we haven't got a strategic plan. I also see universities playing a bigger role: they have a better support system, a knowledge management platform. A hopeful scenario is that they start working more closely with medium-size enterprises. I mean, we are really good at starting spin-offs, but I think we should improve implementing new ideas in already existing companies in order to help them grow further. I also got a feeling we are moving away from teachers' exemption because the number of countries in the world that stick to that system is visibly decreasing. And I also believe the importance of SNITTS will grow. We are trying to change the culture, change attitudes within the university and business sectors, make them meet and collaborate.

"There Have Been Special Relations Between Large Firms and the Swedish State"

Jens Sörvik – PhD, researcher, Research Policy Institute, Lund University

What are the specifics of the innovation system in Sweden?

Sweden is a small open economy, which is connected to global flows, both for large shares of export and import, and the economy is influenced by international events. The economy is dominated by a number of large multinational companies, and small companies, but compared to other countries relatively few medium sized companies. The majority of the large companies are also relatively old. The Confederation of Swedish Enterprise reports that only one of the 50 largest Swedish companies was formed after 1970: Tele2 in 1993.These companies have been based on a successful innovation that was exported, and then the firms have been able to renew themselves through subsequent innovations.

The firms have often carried out substantial local R&D in Sweden. For a long period of time there have been special relations between these large firms and the Swedish state, such as between Ericsson and the Swedish National Telecom operators, Bofors and SAAB Aero and the defence. Some of the firms were also previously public companies, like the previous National Telecom Operator, Telia-Sonera. However these relations have decreased due to international trade agreements, a changed view of the role of state and the relation between private and public, as well as participation in the European Union.

A distinguished feature of the Swedish Innovation System is that R&D is mainly carried out in these large companies, at the same time there are many small firms that innovate and carry out R&D, but R&D activity is dominated by the large companies.

Another distinct feature of Sweden is that the level of new form start-up is low compared to other countries, and with few entrepreneurs, lower than in Denmark and Norway as examples.

Most of innovations originate in the private sector, and there is some originating from the universities, these are however more often related to students than researchers starting firms.

Sweden is one of the countries with the highest spending on R&D, around 5 % of GDP and as mentioned above the majority something like 75% is funded by the private sector and carried out in this sector as well. Then the state finances the higher education and research sector, which mainly consists of public universities and university colleges, where 20 % of R&D is being carried out. In Sweden there are 36 state higher education institutions, but R&D activities are concentrated to the top tier of Universities. The main actors carrying out research here is the largest universities – Karolinska Institute, Chalmers University of Technology, Uppsala University, Lund University, Gothenborg University, the Royal Institute of Technology (KTH), Stockholm University, and Linköping University. Another distinct feature of Sweden is that the institute sector is very small. And most of the public research is being carried out in the Universities.

Most of the funding of Swedish Universities comes from the public sources (regional and national government and EU) and only a small proportion (approximately 11%) is funded by private firms and foundations, the exceptions here are the Karolinska Institute (Life Science) and the Royal Institute of Technology in Stockholm (engineering).

Direct government appropriations to higher education institutions amount to approximately SEK 12.6 billion (46 % of funding). External sources are around SEK 6.6 billion comes from research councils and other public research funders. Approximately SEK 0.9 billion comes from public research foundations and another SEK 1.1 billion comes from the EU. SEK 1.1 billion comes from public actors such as county councils and municipalities. Private funders such as the business sector and foundations contribute some SEK 4.4 billion.

There are four major research-funding agencies. The largest is the Swedish Research Council, which in 2009 shared out SEK 4 billion to basic research in natural sciences, technology, medicine, the humanities and social sciences. The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas) supports basic and needs-driven research in the fields of environment, land-based industries and spatial planning. In 2009 Formas distributed about SEK 850 million. The Swedish Council for Working Life and Social Research (FAS) distributed some SEK 400 million in 2009 and supports and initiates basic and needs-driven research in the fields of the labour market, work organisation, work and health, public health, welfare, the social services and social relations. The Swedish Governmental Agency for Innovation Systems (VINNOVA) distributed some SEK 1.4 billion in 2009, primarily to needs-driven research in the fields of technology, transport, communications and working life.

Another source is the public research foundations that invested some SEK 1.3 billion in research in 2009. The largest research foundations are the Swedish Foundation for Strategic Research (SSF), the Foundation for Strategic Environmental Research (MISTRA), the Knowledge Foundation (KK), the Foundation for Baltic and East European Studies, the Swedish Foundation for Health Care Sciences and Allergy Research (Vårdal), the Swedish Foundation for International Cooperation in Research and Higher Education (STINT) and the Bank of Sweden Tercentenary Foundation (RJ).

There are also private funders, like the Knut and Alice Wallenberg Foundation which, amongst other things, provides funding for expensive scientific equipment, and in 2008 granted over SEK 1 billion to various research projects. The Swedish Cancer Society distributed some SEK 370 million in 2008 for research in its field.

Another feature is that in Sweden the salary levels are relatively high compared to international standards for more basic levels, whereas top salaries are lower. There are less monetary differences. Similarly tax levels are relatively high, but falling, and redistributive welfare system that further decrease differences. At the same time there is a difference in top level and more basic level research institutions.

There are also support systems to potential entrepreneurs, with funding for a start-up period, different kind of funds for testing business plans, and coaching activities. There are also tax financed education and reskilling programmes, and in general the education levels are quite high.

How does the legislation regulate the innovation process?

In Sweden the most unique feature is possible the teacher's exemption (lärarundantaget), which means that ownership of inventions from university teachers is awarded to the individual who comes up with it, and not to the university. There have been discussions to alter this. This has been done in Denmark, but not necessarily with an improvement, as the universities have not had the capacity to handle the IP-rights properly.

There is also a debate about making donations to R&D tax exempted. With the idea that this would lead to more research funding. And there are discussions around a previous tax for property that has led many Swedes to keep their fortunes abroad, which decreased the availability of venture capital in Sweden. This has been removed by the present government, but the opposition has talked about reinserting the tax, which some claim scare people from returning their funds to Sweden.

What are the major participants in the innovation process?

As mentioned large Swedish Multinationals (like Volvo, IKEA, ABB, SKF, Sandvik, Ericsson, Astra Zeneca), National Ministries (Finance, Industry, Education); National agencies for innovation, and regional growth; Regional development agencies; Universities; University colleges; Funding Agencies and foundations; Business Associations; Trade Unions; EU (Regional Funds, Structural funds, Framework programmes).

How important is the government role compared to that of the market forces?

Both are very important but they are carrying out different types of activities. At the same time in Sweden there has been a large involvement of the state as carrying out services and running companies. The state has to an increasing degree pulled out of carrying out activities, and now it's rather funding activities, regulating and providing infrastructure, trying to affect incentives systems; also facilitating by providing education and research to raise human capital. It carries out a number of activities to support new firm start-up, such as loans for proof of concept, incubators, venture capital. Due to quite substantial public pension funds, the public sector is also large owner of publicly listed companies. However these funds are not used in an outspoken strategic way. The state still owns shares and it's a relatively active owner in some large firms, like Telia-Sonera (Telecom), Vattenfall, (Energy production) and SBAB (loans for housing).

The private sector's role is increasing and it is the main actor for innovation. At the same time a number of sectors where services and goods were previously provided by the public have been privatised. In some areas the funding is still provided by the public, like in Health and education.

There are also in some areas of innovation policy an increase set-up of cluster initiatives, and similar forms of public private partnerships aiming at stimulating growth in strategically important sectors, in different regions in Sweden.

What are the latest trends in innovation policy?

There are a number of trends. One can say that there has been a move away in Sweden from stimulating a number of large companies and sectors, and then tax these firms and redistribute incomes from these firms to welfare projects, towards trying to stimulate growth in many parts of the country and trying to stimulate SMEs to grow. In this process a number of new regional universities have been launched around the country. Connected to these are also a number of different regional growth projects, with the intent to connect academia and industry, in projects like cluster initiatives, regional innovation systems and public private partnerships. Often with an emphasis on, so called, Triple Helix initiatives, where the public, private sector and academia collaborate.

There has also been a move away from much centralised national policies, for industry and enterprise support, and research and education policy, towards more decentralisation, where a number of regions have got more autonomy; also the universities have been given more autonomy. There is also EU-funding available for regional efforts and in EU strategies for the next 7 years there is also an increased focus on the regional level as the executive level for innovation policies.

There have been discussions about, so called, Swedish or European Paradox, that nominally there seem to be going a lot of investments in higher education and R&D, but not so much growth is coming out of it. People are arguing for more control over university action and that more efforts should be geared directly towards innovation and commercialisation of university results.

More funding is being provided through competitive measures, and the bigger universities have been more successful in attracting external funding. So there is a trend of increasing specialisation, and where the larger universities are also growing, and it is in these places that the main research is being carried out.

Furthermore some have also argued that the research output and provision of educated students is working fine. The bigger problem in Sweden with regard to innovation lies more in the side of commercialisation, new firm start-up and growth of SMEs beyond subsistence firms. There are arguments that in Sweden there are too large disincentives for starting firms and employing labour.

A number of new universities and university colleges have been started, where the original intent was that these should connect to local specialities. To some extent this has succeeded. At the same time many of these have lived from attracting foreign students with no admission courses, as the admission has been paid for by the Swedish government. Many of these institutions tended to offer similar courses, and not connect much locally. However it is likely that since Sweden has begun to charge foreign students, these regional universities and colleges will specialise more and possibly also connect more to the regional economy.

There are also a number of trendy concepts being

discussed in innovation policy circles, such as Centres of Excellence, Smart Specialisation Strategies, Service Innovation, Knowledge Triangle, Grand Challenges, System Innovation, Related Varieties, White Fields.

What may be achieved through these changes?

There are likely to be more market based and decentralised approaches, where policies become less planned, and less connected to different kinds of preset goals that are hard to fulfil, and where better knowledge about different markets are incorporated in policy development, as well as incorporating better equipped actors in implementation of policies. As innovation is depending on systemic factors, it is also possible to make systemic analysis and address these through these new initiatives.

What helps and what hinders the development of innovation system in Sweden?

For me the term innovation system is an analytical metaphor. I prefer to answer the question what helps and hinders innovation in Sweden.

In Sweden there is a highly skilled labour force, good infrastructure, functioning political and economic system, with relatively stable and non-corrupt institutions. There is also quite high levels of trust between actors, and relatively easy to initiate projects and collaborate between actors, sectors and different kind of institutions. There is a long tradition of people learning engineering skills and successful engineering firms and there are historic popular icons of great innovators that created many of the big firms. In the last few years it has also become fashionable to become entrepreneur and innovator, which is hopeful for the future, as it is individual creativity that in the end drives innovation, even though it is greatly beneficial with a supportive system.

There are some dangers for the future, and one is troubling results in basic education where Swedish students for a number of years have had falling results in international tests.

With regard to innovation support, there is still very much emphasis on producing patents and finding ways of commercialising patents. Within innovation support structure there is less knowledge about commercialisation processes and often underestimation of the efforts and costs involved in commercialising products. There is also a bit too much focus on specific business plans and to follow these, while entrepreneurial process requires possibilities to alter business ideas and business models as the company moves along.

With regard to universities, there is much talk about the 3rd mission according to which university employees should work actively with diffusing results to the surrounding society. Still there are often no resources for it. There is no internal appreciation, and this is not much rewarded, because the most important activity for our career is to publish articles.

The Swedish industrial structure with a number of large companies that dominate business research, and with fewer small and medium sized firms, may prevent positive spill over effects, as there are relatively fewer new firms started up, or other firms to which new knowledge is spilled over to.

In which areas the results of innovation have been most impressive?

There are these large firms mentioned, like Volvo (Automotive), ABB (engineering), Tetra Pak (packaging), SKF (ball bearings), Astra Zeneca (pharmaceuticals), etc. Then in later years another number of interesting firms came in and developed more service oriented offerings, and who have worked with business models, like IKEA, HM, and Tele2 group.

Furthermore there are a number of sectors where Sweden has been successful, like forestry/paper, mining/metallurgic, life science, ICT, mechanical industry/engineering.

How do you explain it?

Swedish companies have been good at innovating, raising knowledge content of products, raising productivity and developing new business models. Rather than trying to protect the country behind customs and tariffs it has faced global competition by improving products and services.

In the 1970s and 1980s the government tried to protect and run companies in the textile and marine technology industries, with great failures. It was presumed that set-backs were only temporary and that through temporary subsidises or by running them through public companies they would succeed in the long run. Also there were public plans on building large metallurgic complexes in rurally backward areas to stimulate growth, which were also fiascos.

Nowadays the marine technology industry is actually quite substantive, but more from small and medium sized firms. However they are not very well known, as most people believe all of the marine industry was knocked out in the 1980s. Likewise in textile industries, it was severely hit, but in later years there have been quite a number of firms successful in new areas, with more of innovative concepts like H&M, and companies with high technology and speciality textiles, and new fashion brands, focusing on design.

How important are technological (innovation) parks?

I believe that a certain percentage of the population are natural entrepreneurs that need no support, and then there is a certain percentage that can run firms with the right type of support. These parks can be good places in coaching presumptive entrepreneurs, and providing them with access to resources to succeed in developing their business.

What is your forecast for the development of innovation system in Sweden?

More decentralisation, more specialisation, and collaboration for all types of actors. More broken up processes, with more different types of suppliers in increasingly complex value networks. The larger universities will become even more specialised in research and possibly cater to global networks, where smaller universities will find niches in regional context but possibly leverage that to international links.

Large firms will continue specialise, and interact with smaller firms that develop risky projects that they can choose to commercialise. Likewise smaller firms will continue to specialise. In the Swedish context I also think that the previous industry structure of many small firms, almost no medium sized ones and relatively many huge multinationals will alter, and Sweden will get relatively more medium sized firms. At the same time it is important with collaboration to develop industry standards.Policy will be more carried out at regional level, but in coordination with national and international levels. At the same time international and global connections will continue to be important and most likely increase, also in areas such as China, India and Brazil.

"You Cannot Impose a Law to Innovate"

Goran Marklund — Deputy Director General, external matters, VINNOVA

VINNOVA has just celebrated its jubilee. Comparing to the situation 10 years ago, what were the major changes in Swedish innovation system? What role did VINNOVA play in it?

The discussion was rather turbulent before a major reorganization of the research funding in Sweden. There was an investigation called "Research 2000" and the proposal that came out of it was to build just one big research council with primarily, I would say, academic focus. That was turned down by a rather strong opposition from industry, and from many others on the ground that the paper had a very one-sided focus on scientific excellence. Leaving to the industry alone to generate innovations, so to speak, would be harmful for Sweden.

The government withheld the decision. Instead it initiated two other committees: one was to come up with a proposal of how to organize funding for basic research and the other one with the task to work out a proposal of how to organize a more mission oriented research with an eye to innovation.

The discussion also continued whether the government should have a particular innovation policy. If we go back 3–4 decades, there was one though it was not called innovation policy. The government controlled some major business oriented activities. It was actually a very important motor in the development of Information and Communication Technology (ICT) network of research institutions, and a very important counterpart to Ericsson. Also, you can see the same pattern in relation to ABB (ASEA at that time) and in relationship with Vattenfall. The same pattern could be seen in other areas. At that time government controlled business (which it still does, but it has different rules now and has to work in more purely market oriented conditions).

That has been changing quite dramatically with deregulation which Sweden introduced after joining the EU. Europe is an open market with equal opportunities for all kind of companies in different parts of the EU. We believe, or at least I do, that proposals that were coming up around 2000 of continuing and even deepening the one-sided focus on scientific excellence were completely out of time. Globalization has changed the way things work, particularly in geographic dimension. Large companies that still represent a very big share of quite substantial R&D investments in Sweden are no longer Swedish, no longer could have a one sided focus on home market as the place where they should increase their investments in R&D and innovation. There is a centrifugal impact on their mindsets and investments strategies where Sweden cannot rely on a good science base as the only attractor for these and other companies. Activities cannot be localized to Sweden, or much less than before. That was the period when VINNOVA started together with other R&D or research councils.

Meanwhile, VINNOVA's total funding represents little more than 5% of the total public funding of R&D in Sweden, while Science Research Council spends more than twice that sum, which is an opposite picture to the situation in Finland where the Finnish Funding Agency for Technology and Innovation (Tekes) with a similar mission as VINNOVA's is very big.

But we always require the industry and academia taking part in the projects that we are funding or co-funding. The turnover in the projects that we are involved in is about 2.5 times VINNOVA's input. So, it's a bigger impact than what can be thought.

We dragged on through a very long period of not very sophisticated discussions on how to develop a more efficient, more up-to-date, more adapted system to the globalized world. Slowly but steadily we have been making our way, and now the time has come when innovation stands very high on the agenda. Now it is being taken more seriously, and we should start thinking of our future innovation potential, innovation strategies and innovation policies. During this time different organizations have done important contributions, including VINNOVA. What has changed mainly now is the overall strategic discussion, which may bring about a change in the overall strategic patterns of investments by the government in the years to come. It's yet to be seen.

This has been obviously substantially influenced by the decisions taken at the EU level and also the EU investments in innovation to face global challenges. Now a new national innovation strategy has started to develop to replace the one adopted in 2005, with acknowledgement of a need of a fruitful interactions between industry and academia without denying the fundamental needs, particularly the needs of academia to have space for free research which not necessarily result in innovation in industry. And I think VINNOVA has played an important role in preparing intellectual ground for that as well as putting forward a fair part of proposals of what should be done.

Comparing to other countries, what makes the Swedish innovation system distinct?

I think history is important, and also the fact that we have had a very long, fruitful relationship between the public sector and innovative, large, internationally connected corporations. It all started in the early 1900s. Particularly after the WW2 these relationships were very important and this is, I think, one of the main explanations why Sweden still has a very large share of private R&D investment. It's about 75%, which is rare in international practice. And it has also contributed

substantially, of course, to quite high R&D investments in relation to GDP in Sweden, which was as high as 4%. Only Israel scored more points with this regard.

On the other hand there is a very strong focus on academic research and a well developed university sector, while a research institutes sector is small by most international standards. We have taken a decision already during the WW2 that the universities were supposed to play multiple roles: apart from being centers of scientific education they are also research institutes for the Swedish society and industry.

So, there are these two big blocks: large transnational corporations and universities. It is not unique of course, but rather distinctive comparing to many other countries. Germany, for example, has a very large and diverse research institutes sector. Finland too has a quite strong institutes sector and many other as well.

Comparing to some other countries, I think, the fact that Sweden is small has also played an important role: because the local market is limited you have to be out globally. Selling abroad is very important: more than 50% of Swedish GDP is export. It means market sourcing, technology sourcing abroad have been a very long-standing pattern, which, I think, influenced very much the mindsets. On the other hand, going back to large companies, some of them now have about 1% of their sales in Sweden and still about 40% of their R&D performed here, which is probably not sustainable. If you are selling in China you need to be in China, you need to have an R&D facility there. This naturally means that the share of their R&D in Sweden is to go down inevitably.

Another distinct feature which is not unique is that for a small country our military industry has been disproportionally big. Now it is changing. The budget spending on defense is going down and over time it will lead to inevitable downscaling in military oriented innovation, which, probably, has been the most consistent area where public procurement has been driving innovation. There are civilian spillovers but they are not really a substitution.

Do you feel you need any specific legislation to promote innovation in Sweden?

You always need to look at what measures will get the work done. And that depends very much on different actors' incentive structure. We are very open, I think we are more market oriented than many other countries. We have stepped away from paternalizing Swedish industry. We are more loyal to the EU than most other member countries in applying rules. If we are speaking about an incentive structure, we mean different R&D bills creating incentives for small companies to invest. It might be a law giving SMEs bigger deductions than today, though they are already bigger than in most OECD countries. And the studies show that such a law will probably have an impact.

We also have problem in innovation procurement. The rules now discourage the procurers in private sector to take risk because it involves public money. Taking risk with public money and then ending up unable to score positive result is really to risk your job and your future. And if no one is procuring things for the future, no new solutions will come out from that procurement. We will stay with old solutions for the future, which hamper innovation. If you want to change that you would probably need a law.

So yes, you should look at rules, regulations and behaviors in the public sector to create incentives for actors in the system. But you cannot impose a law to innovate, it will never work. You cannot command innovation: innovation is a creative activity and it has to be driven by different actors' own incentives. People are creating something because of economic benefit, but not because they are forced to this. Passing laws is an option but not a solution in itself.

In what areas the results of innovation were the most and the least impressive?

In the broad areas it's not difficult of course. The ICT area of course, particularly the mobile phones and the whole infrastructure around them. ICS (information and computer science), robotics, transmission of energy. We have important pharmaceutical industry, and AstraZeneca is still big and is still here. We have vehicles; trucks are the most important ones, but also car industry. It's smaller but still important. I think the gaming industry is important now; software is a stronghold of Sweden.

It is difficult to talk about missed opportunities. There have always been failures. I mean, in 1970s we cherished misguided hopes for fleet industry which had a long history but was facing a very strong competition. Our rivals subsidized strongly the industry and eventually those subsidies did work while our industry almost died. That is, I think, was a failure to draw some important lessons from.

The same other story goes with textile industry which used to be quite substantial but also has shrunk. Now we have an emerging textile industry focusing on high tech textiles growing out of these environments. So an industrial policy which tried to subsidize sectors severely attacked by international competition was a real failure primarily because innovation was not in focus. Nowadays Sweden is allergic in political discussions to subsidies for industrial sector as a root to success. Now it's almost impossible. We have it still in agriculture together with the rest of Europe although many here argue that we should try to decrease subsidies and be more open to the global division of labor. It is a long story, but substantial subsidies for agriculture sector in fact make us pay more for food.

What is your perception of Swedish innovation policy in the next decade?

I hope that we have read the signals right. If that's the case a much more ambitious innovation policy will come out. We are looking forward to some substantial change in policy and activities, including the financial policy. It may be a little early to speculate about how exactly it will look like, but it will be more substantial, more changing the overall incentive structure and the resources devoted to it, and with more emphasis on international cooperation.

Do you foresee any particular technological breakthroughs?

It would be speculative to talk about technologies. We need to focus on societal challenges like the energy area, or how to deal with demographic challenges in terms of how to make elderly care more efficient and also more effective. And healthcare system has much to do with management of hospitals and with pharmaceuticals. So, I'm talking about those kinds of solutions where you have to bring different competences together rather than saying that we have this or that technology. But of course there will be technological breakthroughs, a lot of them.

"It Is Important That Prime Minister in Person is Involved"

Bengt Molleryd — Executive Secretary, Technology Policy & Research Management, Ingenjörsvetenskapsakademien (IVA) (The Royal Swedish Academy of Engineering Sciences)

Magnus Breidne — Executive Director – Projects, Ingenjörsvetenskapsakademien (IVA) (The Royal Swedish Academy of Engineering Sciences)

What are the current trends in development of the Swedish innovation system?

BM: What is now called an innovation system started to develop in Sweden more than a century ago. Sweden as a country prospered to a large extent thanks to innovations. Inventions in most cases came from abroad while innovation spirals so to say were developed here, and major engineering companies were built on innovations. So the history of Sweden over the last 100–120 years is a history of innovations, although nobody at that time used this word, and the name itself became popular within the last couple of decades.

Certainly the political climate and the economic framework have been very productive for innovation in general terms. We are now discussing how to make it better.

MB: In the last ten years there has been a lot of push from the government: "let's innovate". A problem that we came across is that we've got a lot of small companies but they are not greedy enough to grow bigger. One of the debated topics is how innovation can uplift them to increase their income, to employ more people. And there comes the most basic question of how you define innovation. I think it's getting more and more blurry in Sweden what should be meant by innovation. Many people now use 'innovation' and 'invention' as kind of synonyms. It shouldn't be done that way. I think those who really understand or believe they understand what it is all about talk less and less about product and more and more about services, etc.

BM: Yes, substance of this feature is more abstract or diffused, multifaceted so to say, it is rather difficult to have proper indicators or statistics on innovation capabilities or outcome in the European Union countries. According to the data they use Sweden is at the top of the list, bit still I am a bit skeptical and I believe the 'measuring' does not give an adequate picture because it is difficult or diffuse, too often than not it's a matter of subjectivity.

MB: I think the Swedish problem and why it becomes ever more urgent is something that is called "the Swedish paradox": we pump a lot of money into the system in terms of percentage of the GDP, and very little came out of it during the last twenty years or something. There are very few new big companies and this is the paradox which makes the government worry. We have scores of publications in scientific journals and papers but no products. The R&D should be more applied. I think it's true in Russia too: scientists are overwhelmed with science, they feel rewarded if they publish a lot and they are referred to a lot, and not if they create new companies. Or if they help achieve some technological advances but that is not yet innovation. Originally there was a belief in Sweden that what is needed was to push scientists to create new companies to deliver their ideas to the market. Then the understanding came that it was a rather simplistic perception and the relationship between creation of new knowledge or new technology and the market is more complex and you need specific media for that rather than merely expanding your laboratory to commercialize your great ideas.

What makes Swedish innovation system distinct compared to other countries?

BM: I would say Sweden is kind of engineering society with a strong creative element inherent in national culture.

MB: There is close collaboration in the triangle between industry, research and the government agencies. One of the parts of it is VINNOVA, a government agency with a specific aim to support the development of the innovation system. Also we have funding agencies. And those bodies help to tie businesses and universities together, showing the entrepreneurs what is going on in research labs and what might be of commercial interest for them, and vice versa helping industrialists to set practical tasks before the researchers. I think we're kind of breeding and promoting that idea.

BM: May be the driving forces are not in balance, but interaction between the three makes sort of philosophy we are going to pursue.

MB: There is a lot of discussion because it is not clear what they use for measuring innovation. The input is there but the

Russia can effectively study the challenges it is facing in its own infrastructure sectors such as the energy sector, and work towards finding a solution to meet them. The Russian Government could thereafter draft the policies for its own national innovation system

output is really difficult to measure. Consequently we are not sure that we are that good. Of course we have Skype and several other good new things. Skype is not extremely high-tech, it's a smart idea. And much of innovations are in fact simple things meeting the needs of customers.

In this system what is the role of your Academy?

BM: Being a promoter of innovation, of the use of technology has always been a basic role of the Academy.

MB: About a year ago IVA started a big project called 'Innovation for growth'. It deals with things that could have been done but haven't been done in the Swedish society in the field of innovation. Normally IVA is a think-tank. In this project it acts more like a lobby organization. This project is about innovation in a very general sense. What to do to ensure that the system has all the players and these players easily meet, that's what it all is about.

BM: The academy encompasses all the vital stakeholders so to say in innovation, so we are working on a rather high level in that sense. Actually we are not innovating things, we are not a research laboratory or an institute, we do not produce but we are helping the system to develop and to change, helping people involved to align with each other. We reach the key figures from all quarters of the society and in that sense we have a rather good impact.

MB: We provide sort of neutral arena for key players including ministers, industrialists and others to come and to discuss…

BM: And doing that we get quite an eager and positive response from all kinds of stakeholders: from the government, from industry, from research institutions and scientific community.

Do you feel taxes should be somehow adjusted to serve the needs of the innovation process?

MB: It's a good question because there is always a lot of party politics in it. In general I believe there is a consensus that the lower the taxes on the companies the easier it is to start new ones. We have been discussing for years an 'expert tax' the idea of which is that we as a small country need to attract knowledgeable people in various specific fields. Living abroad they are accustomed to pay much lower taxes compared to 50 per cent they are going to lose after coming to Sweden. Of course it does not encourage people to come. I don't want to overdramatize but there is indeed a big issue whether we should allow foreigners coming to stay in Sweden for long (and the length of stay is a point for further discussion) to have lower taxes. And this is also part of what we are working on now: get more knowledge; make it easier to bring knowledge to Sweden. Scores of medical doctors and other medics coming here are cleaning floors because they are not allowed into the professional labor markets, because first you have to learn the language, then you have to pass all the medical exams in Swedish. And there are many similar and other hurdles.

BM: Another side of the coin is taxing the company owners, but I think Sweden has moved already from a very prohibitive model of the past which pushed many inventive and entrepreneurial people to go to Netherlands, or to the UK, or to Switzerland instead.

How did the innovation landscape change within the last decade or two and what are the major trends in the innovation process nowadays?

BM: Globalization although not quite a new phenomenon obviously is

We as a small country need to attract knowledgeable people in various specific fields. Living abroad they are accustomed to pay much lower taxes compared to 50 percent they are going to lose after coming to Sweden. Of course it does not encourage people to come

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LIFE IN TECHNOLOGY (LINT)

LIFE IN TECHNOLOGY (LINT) is an international event that brings together the leading minds in finance, industry, science, art, politics and social organization for a discussion of how various aspects of modern life are affected by technology will take place May 21–23, 2011 in Moscow. LINT is organized by the Digital October Center, Telemarker and Kite Ventures – the same team that organized the TechCrunch Moscow in December 2010.

www.lintconf.com

International Industrial Exhibition

International Industrial Exhibition "Power efficiency. Energy-saving. Innovative technologies and equipment" organized by Exhibition Company FAREXPO JSC will take place in Saint Petersburg May 31 – June 3, 2011. Exhibition profile includes energy efficiency and energy saving in transportation of energy resources and generation of heat and electricity; energy saving technology in engineering systems of industrial enterprises, buildings and structures; energy efficient equipment, devices, products and materials and much more.

www.en.farexpo.ru

Yandex Investing in Startups

InYandex has launched a startup investment program Yandex.Factory. The program offers funding opportunities to Russian and international projects. Yandex will finance startup projects with demonstrated potential in their seed or early investment stage. The company is ready to fund a project's technology or product development with up to hundreds of thousands US dollars. To join the Yandex.Factory program, startup teams in Russia or the CIS can present their projects at the company's traditional open-doors event Yandex.Start.

www.company.yandex.com

the major trend affecting all spheres of activities, innovation included. In the past all the headquarters of our big companies were located in Sweden and so were the enterprises´ manufacturing. Today however we live in more internationalized world where national roles are not so clearly codified and we have to compete more rigidly than in the past to attract talented people, investments and technologies. That's one major change, most visible and profound perhaps. A deregulation in government politics should be mentioned too.

MB: In the past some public owned companies specifically in the field of telecommunication or in energy sector proved to be rather innovative or at least technically advanced. The characteristic trend was a close collaboration between the government and several big companies in which their research and production have been supported by massive government orders and procurement. Such were the cases with Ericsson in telecommunication, ABB in electric power or SAAB in aeronautics. Then it was more or less restrained, if not prohibited after Sweden joined the EU and WTO. Now it is coming back but in a different form. If we turn to most interesting features of today I would mention so called innovation procurement. That means promoting innovative companies from the position of a smart customer. And if you are a big customer like the government you can do a lot. Look at the healthcare: public authorities and agencies are huge customers there. On the practical side turning more towards services rather that manufacturing can be stressed. And the government increases funding of research.

BM: And perhaps it is also worth mentioning that there are big expectations that universities and technological institutes deliver more innovations. However despite some advances the success so far has been limited and there is much more to be done in that area. I think there should be a balance between the research based innovation in universities and institutions and other more market oriented mechanisms and structures. Both streams are important.

What helps and what hinders Swedish innovation?

MB: There is a special role for the government to play. We are one of the organisations that are pushing the government to have an agenda, a strategy for innovation. We think it is important that prime minister in person is involved, that he feels that he owns that agenda. In Finland they have a special council for innovation with all central stakeholders present, and the chairperson of that council is the prime minister. Many people here recommend a Finnish model. It does not seem that it would happen here or happen exactly in the same form, but that is one thing that we discuss and that we believe must improve in our innovation system.

Also there is lot of discussion about financing: whether the funding must be more specialized, more narrowly channeled, or since you cannot know exactly what innovation would show up – always a risk affair, you need to invest in it rather broadly, as it is being done now.

BM: General attitude towards innovation, and other investment into the future, is also a very important factor and you need to get people interested to innovate, to keep and to increase an interest and willingness to innovation in the society.

MB: And another key word often to be heard at the discussions is 'leadership'. It is not only about government and a prime minister, but also business leaders must promote innovation in their companies, maintain an atmosphere encouraging people to be creative, stimulate them with higher pay or other bonuses.

BM: And of course innovation is a risk-taking enterprise, one shouldn't forget that. There should be ways and mechanisms to accommodate and to absorb risk, people must feel they are secure and safe to take risks. And the system, the society must grow openness to new solutions and new opportunities, not let itself be monopolized.

Speaking about risks and inherent failures are there areas where from your viewpoint Sweden has failed despite efforts and money invested?

MB: May be I'm biased because I came here right after a discussion about Swedish biotech industry and it is obvious that one or two of major and very good pharmaceutical companies have been turned down, and now it is realized that was a huge mistake.

BM: Of course in that particular case a lot of accumulated knowledge and competence have successively been utilized, but some ten or fifteen years have been lost.

MB: Another sector we can speak about failure is automotive industry, but one should be realistic: we are too small to afford luxury to have two automotive companies and expect them to withstand the pressure from the world market.

And to the contrary what were the areas where the progress was most impressive?

MB: It depends on what timeframe you choose. In telecommunication Ericsson has been very good and there have been many startups around it. But then there are in a superficial perspective simple service industries like IKEA: it was an extremely good idea to invite a customer to do everything to his liking providing him with everything in a flat box.

BM: On a grassroots' level you may find fantastic examples – in the biotech and nanotechnology.

MB: Still I would repeat it is very difficult to predict winners, so I think we must keep an open mind that it is hard to ask you and your company to be inventive, and even if you invest heavily you cannot be sure it would pop up exactly there – it may pop up somewhere else. You must always have more than one focus area.

And of course innovation is a risk-taking enterprise, one shouldn't forget that. There should be ways and mechanisms to accommodate and to absorb risk, people must feel they are secure and safe to take risks

"If There Were No Failures, There Would Be No Innovations"

Jerker Moodysson – PhD, Assistant Professor in Innovation Studies at CIRCLE

What are the major players of a national innovation system in Sweden?

It depends on who is making the definition. I think the most common way of understanding innovation system is to follow a broad definition that includes a production structure, a knowledge infrastructure (various forms of educational institutions like universities, elementary schools and more applied training organizations etc.), and a support structure consisting of governments on both national and regional levels, as well as unions, various types of technology transfer offices which start to become quite common now, and not the least important is an institutional framework surrounding those actors. I mean the structure that defines human behavior in the society, regulations, norms, cognition and so on. That, I would say, compose the innovation system, or at least how I see it, and how we've been working with it in our research. However, there also is a much more narrow approach, more or less focusing on science and application of science in innovations.

Comparing to other countries what are the specifics of Swedish innovation system?

There are some things that are not exclusively Swedish, but something that would characterize our innovation system. First of all, it's a coordinated market economy. You know, the state has quite a big influence on setting conditions for business. We have a well-developed social security system, which, I think, is quite important since it increases incentives for people to take risks because the consequences if you fail are not that dramatic as in some other countries. That's the most important thing that I would like to mention as characteristics.

Also we generally have a high level of education and a large share of population continues with advanced studies at the universities. That's also an important feature.

We have several big companies in telecom and some other sectors, but the most important innovators in Sweden are small companies. And also the universities. That's a trend not only in Sweden but in many other countries too. Universities are transforming from being purely educational institutes to more entrepreneurial structures, they are becoming more policy makers actively engaged in shaping the innovation policy in different ways. That's something worth mentioning. More and more universities are establishing their own technology transfer offices while some fifteen years ago it was a very rare phenomenon, I think.

On a negative side I would say, we have too little money in the system, too small venture capital, especially early venture capital. Wealthy people are not very much willing to risk their fortune, to speculate with their money and to provide venture capital. Also we have quite high taxes, though if you compare them to other countries they look not that dramatic after all.

From the legal point of view, does the government participate? Does it create legislation to promote innovation?

They of course use different means to steer innovation policies. There is one quite important mechanism, though Sweden isn't, of course, the only country that uses it. That's what they call the "teachers' exception". In most countries if you work for university and you come up with a new finding which can be commercialized, your employer (in fact your university) owns the right of that invention. But in Sweden there is an exception for university employees. So, if a university employee comes up with an invention that can be commercialized, he or she owns the rights to it. Now it is under debate whether it should be changed or not. On the one hand, it creates incentives for universities employees to innovate. On the other hand, it's totally up to them whether they commercialize it or not. Most university employees are experts in research and not in business and they need much support to commercialize their findings. That's an important Swedish legislation that is still different from other countries.

Is this exception limited to a certain time or is it limitless?

The property rights belong to inventors, but then they can sell them if they want to. And that's what they usually do when they commercialize inventions – they normally assign the property rights to someone else to take it further. But also some create companies. There are startups from the universities.

A similar system existed in Denmark as well but they removed that exception about ten years ago and adopted an act under which the universities own the findings. If it's possible to commercialize them researchers provide that opportunity to universities. I haven't really followed the latest developments, but it didn't become a major boost for innovation in Denmark when they removed the teachers' exception. Now it's under debate in Sweden.

As for other legislation, in most cases our regulations are quite adjusted, for instance, to the EU norms, so there is no major difference. This is quite internationalized, the regulatory part of it.

But then, of course, there are differences in attitudes, for instance, attitudes towards failure. What I think is more important than the regulative part is how you as an entrepreneur perceive if you fail. If your company fails is there a stigma attached or is it seen as a merit? There are some extremes like Japan versus the US, for instance. In Japan it's a big shame if you fail; in the US this is something that you can even put into your CV. Sweden is somewhere in between, but all this doesn't have much to do with regulations.

The state and the market are playing different roles. Who is the major player?

The market is the major force in terms of setting the agenda for innovation. But the Swedish market is not that interesting because it is small, so major players are the European and the global market. The state in Sweden has a strong role; it intervenes when the market doesn't work properly, for instance when it comes to the social security system. Both are important though: without a well functioning market there is no basis for innovation. But on the other hand, if the market is not really working properly, then the state could fill the gaps. A simplistic top-down approach from the state supporting innovation without demand wouldn't work, it would fail.

However one should not neglect public procurement either. For instance, in health care it could be a driver of innovations of various kinds. There might be, so to speak, a consumer market for certain drugs but it's the state that really funds them. Speaking about a pharmaceutical sector, there is, probably, a strong demand for procurement for both HIV and cancer. In the case of cancer the market would, probably, be sufficient to drive innovation because there are wealthy people who suffer from that disease and can pay for treatment. But in the case of HIV the major demand would come from African countries where there is no real market. Therefore public procurement would be a very important driver of innovation in that field because pharmaceutical is still business although human lives depend on it. So I believe both players are important, but the market is the main driver.

Comparing to what it was 10–15 years ago, are there any important shifts in innovation policy?

Yes, there are a couple of things that are worth mentioning. One is the changing role of the universities from sort of providers of education and pure knowledge to more active engagement in innovation policies. This is one important shift and it has accelerated in the past 10 years.

Another important shift in Sweden is that regions are getting more autonomy. We used to have a system where the state was in principle responsible for all major innovation policies and they gave directions to the regions. The idea was that there should be equal growth in innovation capacity and the benefits from a national growth should be distributed between all Swedish regions. Now the regions get much more responsibility. Skane region where we are now was among those where a pilot program was applied some years ago to test whether this works in practice. Now they have implemented this in most regions. The regional governments (if you can call them such in Sweden because we don't really have regional authorities of the type of many other countries) or the regional public sector representatives have much more influence on the innovation policy compared to 10–15 years ago. That's one major trend, which, I think, is for the good. It gives possibilities to find right approaches because different regions and sectors have different requirements on innovation support. The idea is that the regions should become more self-reliable.

Those who maintain that taxes make a problem tend to disregard the fact that the taxes are the basis of our well developed social security system, which I would identify as one of the main straights

What helps and what hinders the development of the innovation system in the country?

What help is a well developed social security system and a high level of education – the quality of human capital. What hinders is the lack of money. That's to put it shortly. Add to the list small market and limited venture capital. There is also something people call a Swedish paradox. We have a high level of education, we are good at inventions and we spend a lot of money on R&D – both public money and corporate. But we get little out of that in terms of innovation. Innovations are realized in some other parts of the world, the US for instance. That's what they call the Swedish paradox – a lot of input, but not so much output in innovations and growth. That's a problem and it has to do largely with lack of venture capital in the right time. Before you have a totally defined product, before you have indentified the end marked a lot of money might be needed to keep your innovation living. I think that's the major issue right now.

Some would also say that we have high taxes. If you earn a lot of money there are incentives to leave Sweden and to settle somewhere else. I'm not really convinced by that because I think that we have quite a lot of successful business leaders still living in Sweden. Those who maintain that taxes make a problem tend to disregard the fact that the taxes are the basis of our well developed social security system, which I would identify as one of the main straights. So, there is no really a quick fix to this paradox.

In which regions the results of innovation were the most impressive?

Stockholm region is, of course, very interesting if we are talking about regional innovation development. But it mostly due to the fact that it's a capital region. Skane region is also interesting because it is starting to become more and more connected and integrated with Danish capital region Copenhagen. From the point of view of innovation policy, I think this is the region to study in Sweden because people here are pioneers in innovation. They have taken the opportunity when more autonomy was given to the regions to design their own innovation policies. So, I believe, it all boils down to big city regions – Stockholm, Gothenburg, Malmö, Umeå in the north.

VINNOVA, the Swedish governmental agency for innovation systems has some programs, which have been very influential on regional innovations. They are called VINNVÄXT. They have one focusing on the food sector in this part of the country. In the north they have what they call "the biorefinery of the future", which, I think, deserves being looked into. It's an attempt to promote renewal in conservative old sectors such as pulp and paper and

to promote innovation there. The focus has been so far on energy, ethanol production. That's also in interesting case.

Did Sweden experience any failures on the innovation path? Perhaps, there was something that looked very nice from the beginning, but in the end turned out to be a loss of money?

Failures are always part of the process. There are many examples on the company level. I can't really recall an example where the government pumped a lot of money without any return. In terms of policy promoting regional development there were some failures. For instance, in the 1970s they wanted to build an airport in every part of the country. Those are the examples of failure in policy.

At the same time failures are inherent. Most attempts of making innovation are failures. Most successful innovations are results of failures, unexpected things. I mean you are planning to do it in a certain way and it turns out that this doesn't work, but you find something else instead. Then it becomes an innovation. So, failure is a normal part of this business, if there were no failures, there would be no innovations.

Speaking about technology or science parks, how did it all started and what role do they play?

The idea of science parks in Sweden is nothing new and it has served more or less as a role model to other science parks. First of all, I think it does not work according to the book, so to speak. Nor is there much inter-firm collaboration for knowledge generation either. The simple reason is that firms involved are more often than not very specialized high tech companies that act on a global market. Thus, if a biotech company is searching a new collaborator there might be 4 or 5 potential collaborators in the whole world, and it's unlikely that they are located in the same science park. So, they may collaborate for more simple things like borrowing material from each other and so on.

Science parks perform other functions. First they are creating a brand: it's a status address to be in a science park. The second thing is that they serve as a large pool of qualified specialized human capital. Humans stick to one place. They are not much willing to move, especially internationally. So, when there is a need for new employees they can recruit from each other.

Still, there are a lot of attempts in promoting local networks though, I think, that's not the right way to go. That won't pay off because the companies are experts in finding their collaborators. They are building networks on a global level to a much larger extent than within the region.

The science parks also usually incorporate incubators. For new companies, university spin-offs, for instance, it might be a good thing to have support in terms of technical infrastructure and also various forms of business services until you learn to survive on your own. Of course, it is very important that science parks play a role in supporting early start-ups, while for large and well-established companies the human capital is the key why they would like to be located there.

Looking into the future, what trends do you see in the development of the Swedish innovation system?

I think of what we are witnessing to now – an increased power to the regions – will continue. And I also think that universities will continue to be the key players. They are going to be even more actively engaged in doing things that usually were made primarily by business and governments.

Most of the Swedish innovation policy and concrete activities like those that I've mentioned before (VINNVÄXT), are built on this principle of Triple Helix meaning that there should be representatives from business, universities and public sector. But they have some problems with business engagement in the process, so it's more often a "Double Helix" with universities and public sector creating strategies, but they are disconnected from the business. The policy activities are becoming less appealing to businesses; they feel that there is nothing for them in these initiatives. They might take part in some activities to show good will but then after a while they find that this only costs time and money, and they withdraw. Business must be much more involved into the formulating of policies. But I don't have a ready answer on how that should be done.

I think Sweden will continue to be a welfare state comparing to other countries. That's for sure. If you put Swedish glasses on, we have had a shift to the right with a former conservative party being in power now. But by international standards they are all social democrats. I mean, there is no left and right in Sweden in their classic definition. Everything is focusing on welfare state, and I think that's something that we should try to keep. I don't know how to deal with the lack of the venture capital but I would suggest, probably, to bring more international money into the system.

What research and technological developments may assure a breakthrough in the years to come?

If I only knew that now! I don't think that Sweden will differ much from any other country. Of course, there will be a strong focus on sustainability issues like sustainable energy and so on. There will be a lot of attention also to combating some major diseases. And then in this region we have quite a lot of focus on material sciences. You may have heard about an establishment called the European Spallation Source (ESS). This is a big new research unit that will be established in Lund in about 10 years from now. I don't know what will come out of that but that will define quite a lot of Lund university activities in the future. And also a lot of research money from Europe will come and be invested in that field as well.

But my major guess is that there will be a lot of efforts to sustainability, solving the obvious problems with CO2 emissions and the risk of nuclear failure and so on. And then, of course, looking at less important from a global perspective issues, but quit important for Swedish economy, something what we touched upon earlier – what should we do with the north, with forest, with natural resources we have? How should we renew industries related to those resources? I think there are a lot of interesting things in energy, but also special chemicals making plastic bags from forest waste. Things that have less global relevance but that are very important nationally and locally.

The National Innovation Strategy Is Developed in Dialogue

Jan Sandred — Program Director, Innovation Actors Division, VINNOVA

How do you define "innovations"?

For VINNOVA innovation is not only about technology. Innovation is taking the invention – the idea – from the mind of the inventor into common use. Innovations always comprise different components like a technology part, a service part and a business model. The iPhone, for example, is a new product, but people buy it for the apps, and Apple earns money on their ground breaking business model in iTunes. The technology itself would have failed without the other components.

How innovative is Swedish economy?

There are five countries in the world which design and build state-of-the-art unstable fighter jet planes: the US, Russia, UK, France and Sweden. It's quite an achievement for a country with only 9 million citizens.

Sweden was built on innovation. The country gave the world many multinational companies like Ericsson, ABB, SKF, AlfaLaval, IKEA, AstraZeneca. Many products common today are Swedish patents and innovations like the refrigerator, the zipper, the centigrade thermometer, the propeller, the car safety belt, the catalytic converter, the pacemaker, the adjustable wrench, the dynamite, the safety match, the ball bearing, the bill counter – to name a few. Also, Swedish invented some ground breaking innovative functions, like the "green call button" used in every mobile phone on earth. In the spring 1979 Laila Ohlgren and her colleagues at Nordic Mobile Telephony (now Ericsson) faced a problem – the dialing from a mobile phone in a cellular network. Lifting the handset and then dialing the number worked poorly. She came with an idea to make use of the microprocessor in the phone to save the number and then send the entire package of figures at once by pressing a dial button. Oh yes, and Skype – also a Swedish innovation. And we still invent: Sweden has the highest innovation performance of all countries within the European Innovation Scoreboard.

The political and economic powers in Sweden have for a long time been united by strong common interests. The Social Democrats got support for their social and economic policies from the private sector, if the largest firms remained under Swedish control to prevent the capital to migrate. And the economic policy was tailored to suit the large dominating companies. For example:

No foreign exchange control
Low corporate tax rate
Extensive tax treaty network
Dividend participation exemption
No Swedish tax liability on outbound interest payments
No debt/equity limitations

In Sweden public limited companies also separate stock owner votes from capital. On ideological grounds the Social Democrats focused on the largest listed firms, in particular, their investments and research and development spending. They supported financing via tax-subsidized retained earnings and loans from a strongly relation-based banking system. The economic policy for egalitarian reasons disfavored equity markets as a supplier of capital.

Thus Swedish firms have only to a limited extent been dependent on the stock market, ownership did not disperse and there has been a very limited formation of private fortunes tied to new, fast-growing companies fuelled by equity market financing. The result is an unusually large proportion of very old and very large firms dominating the Swedish industry, with well-defined owners in control. 31 of the 50 largest listed Swedish firms in 2000 were founded before 1914. Only 8 were founded between 1945 and 1970, and no large company has risen after that. This agreement between the political and corporate powers worked well until the 1970s, but the economy stagnated and did not respond to recessions and the globalization.

In the late 1990s the then government became interested in innovation policy and decided to coordinate between economic growth policy and research policy, by forming the Swedish Governmental Agency for Innovation Systems (VINNOVA) in 2001. The agency's aim is to increase the international competitiveness of Swedish researchers and companies, and promote sustainable growth in Sweden by funding needs-driven research and the development of effective innovation systems. VINNOVA today have a yearly budget of €220 M to invest in new and ongoing projects. VINNOVA generally requires co-financing of all projects, which doubles the annual investments to around €440 M. VINNOVA also cooperates with a number of other agencies, like the Swedish Agency for Economic and Regional Growth, The Swedish Energy Agency and Invest Sweden.

How do you access the effectiveness of VINNOVA? Could you, probably, name any concrete programs?

VINNOVA perform yearly evaluations and impact analysis of its innovation supporting programs and activities. It is clear that they fulfill a vital function for Swedish industry's technology supply and competitiveness.

For example: at the beginning of the 1990s the Swedish government, in close collaboration with the automotive industry, invested in the long-term Vehicle Research Programme (fordonsforskningsprogrammet). Both Volvo Cars and Saab were able to establish Research Excellence Centers within important technological fields.

The program strengthened the research expertise in the

automotive industry, as well as the industry's interest in and capacity to absorb research results into its own development activity. It increased collaboration with universities and research institutes and reinforced the international competitiveness of the Swedish automotive industry. On the academic side automotive research has been extended into a number of areas such as quality, safety and environment.

The Vehicle Research Programme has made a significant contribution to maintaining the competitiveness of the Swedish automotive industry. It has provided important research results applicable to product development.

The relationship between the automotive industry and the local and national authorities has gradually changed from being negotiating opponents to being partners. This has built up a platform for ongoing joint ventures of interest to both sides and beneficial to the international competitiveness of the Swedish automotive industry. This collaboration model is utilized to maintain the Swedish automotive industry's future in the increasing international competition.

What other agencies are responsible for innovation development in Sweden?

Today the Ministry of Enterprise, Energy and Communications and Ministry of Education and Research share the main responsibility for promoting innovation. The design and implementation of policies and supporting programs are passed by the government to VINNOVA.

Sweden does not have an explicit innovation policy, but the general visions are stated in the official document "Innovative Sweden". It is an attempt to achieve growth through renewal and is geared towards: the creation of a knowledge base for innovation, development of an innovative trade and industry, the use of innovative public investments and the promotion of innovative people.

Much of the recent innovation action on the national level are focused on strategic programs for key industry sectors, a better structure for seed financing, focused research and development investments, combined with measures to strengthen innovation activities in SMEs.

How important is the government role compared to that of the market forces?

In order to strengthen the interaction between academia and industry, several national programs have been launched by the governmental agencies. These programs facilitate the process of commercialization of research results and creating small businesses at universities and research institutions, for example funding to Swedish Network for Innovation and Technology Transfer Support (SNITTS), Technology Transfer Offices incubators and Research Centers of Excellence at universities. The task is to support long-term relations between academia, business and state in innovation and research and development areas.

Our business sector's investments in research and development are the highest in the OECD in relation to its GDP: 70 % of the national investment volume in R&D is in companies. But the investments in R&D are concentrated to a few big companies. The 20 largest companies in Sweden account for approximately 2/3 of the business sector's total research and development expenditure.

A uniquely high proportion of research funding in Sweden comes from private foundations and other non-profit bodies. Among OECD countries, only the UK has a higher proportion than Sweden. The research financing by companies in Sweden is more modest, but in sum private, non-profits and companies provide 15 percent of research funding of Swedish universities – a level comparable to the US and surpassed by few EU countries.

The industrial research institutes also perform R&D, but that is directed to business. Interactions with businesses are carried out by commissioned research from the industry. This sector is rather small in comparison with other OECD's countries; therefore these research institutes closely cooperate with academia and other research and development actors.

What are the strengths and the weaknesses of Swedish innovation system?

Today Sweden have stable macroeconomic environment, the highest economic growth in the EU, a highly educated workforce, a number of research and development intensive

INNONEWS

V International Forum FROM SCIENCE to BUSINESS "Modern Concept of Universities and High-tech Business Cooperation"

The Forum will take place in Saint Petersburg May 11–13, 2011. The goal of the event is to discuss the current situation, problems and development trends of the Innovative zone around higher education and science institutions with active participation of the state authorities and business (big, medium and small) in cooperation with science and research community. It is planned to pay special attention to open innovations, foresight and green technologies. The special accent will be made on discussion of human resource problems for the innovative projects.

www.fs2b.ru

NT-MDT Co. Opens a New R&D Office in the USA

NT-MDT Development in Tempe, Arizona, is a new team of NT-MDT Co. It started the activities in April 2011. To address the increasing activity of NT-MDT Co. on the US and world markets of scanning probe microscopy equipment, the company has invited the experienced AFM developers and practitioners: Sergei Magonov, John Alexander and Sergey Belikov to form the research unit NT-MDT Development.

www.ntmdt.com

The XIVth Tomsk Innovation Forum INNOVUS «Innovative Russia – 2020: How to Launch the Knowledge-Based Economy?»

The XIVth Innovation Forum INNOVUS «Innovative Russia – 2020: How to Launch the Knowledge-Based Economy?» will take place in Tomsk May 26–27, 2011. INNOVUS acts as an annual nation-wide communication site for discussion of the Strategy for the Innovative Development of the Russian Federation until 2020, which identifies key practical steps needed to launch the innovative economy in Russia.

www.innovus.biz

corporations, and ambitious public investment in activities related to innovation and state of the art scientific performance. These strengths are reinforced by Sweden's integration into global markets.

In terms of adopting existing technology in products and processes, Sweden seems to be highly competitive, in both manufacturing and services. Sweden is among countries which top the world rankings for indicators such as competitiveness, technology and innovation climate. Sweden's investment in research, at nearly 4 % of GDP, is exceeded only by Israel in the OECD statistics.

Extensive decrease in activities among the dominating industrial groups, combined with low levels of investments in the business community, and an inability to achieve efficient job creation, has put pressure on the Swedish innovation system. Last years a decreasing rate of business R&D spending and a termination of the Swedish model for public-private partnership have accelerated these weaknesses.

Swedish universities produce a high number of start-ups, but and they generally grow at a considerably slower rate than spin-offs from large companies or from research institutes. They generally tend to remain very small, with only 1.5 employees on average after two years. This is a low growing rate compared to most other European countries.

Researcher-initiated or researcher participation in high-technology start-ups is very low. Only about 1 % of all new firms in Sweden are researcher-initiated. And most researcher-initiated start-up firms are generated from high-technology manufacturing firms.

Industrial renewal through start-ups and growth in small, innovation-based firms is a weakness of the Swedish national innovation system. The weakening Swedish basis of the large industrial groups in Sweden due to the globalization, together with the limits to public sector expansion, have made it important to increase the rate of knowledge-intensive start-ups and high-growth innovative SMEs in Sweden. Since small firms generally show higher rates of radical innovativeness than larger ones, the rates and growth of knowledge-intensive SMEs is critical to the growth of the Swedish innovation system and make an important part of the innovation strategy.

What was the reason?

There are several reasons. The Swedish research system has by international standards focused more on basic research and relatively little on needs driven research. Of the total national research and development funding only 6 % is allocated to promote innovation.

Sweden has been efficient in supporting innovation in large research and development intensive industrial groups, primarily through flows of people with a higher education, but relatively inefficient in supporting sustainable start-ups, innovation support in SMEs and public sector innovation.

What do you think about Swedish innovation policy in general?

The Swedish government has not had a specific national innovation policy, but in 2010 they initiated the development of a National Innovation Strategy 2020 in order to create trustworthy long term conditions that will serve to augment growth and raise prosperity in the Swedish economy.

Politics alone cannot create innovation. But politics can influence the conditions for innovations to occur. The aim of the Swedish national innovation strategy is to provide the best possible conditions for universities, corporations, public administrations and regions to be innovative and internationally competitive – that is, to meet the challenges, needs and demand for new or better solutions. These conditions are affected by issues from many areas, and therefore the entire government and all ministries involved in the strategy.

The national strategy is developed in dialogue with the whole of society – business, public sector, academia and civil society. Individuals, companies and organizations across the country contribute, both to the vision and how we will achieve this vision.

INNONEWS

Ericsson Commits to Russia's Skolkovo Innovation Center

A strategic agreement has been reached in Russia that will help drive innovation and development in the country's science and technology sectors. Under the agreement, Ericsson will play a key partner role with the non-profit Skolkovo Foundation in the development of the Skolkovo Innovation Center, a high-technology business park aimed at promoting the development of science and technology companies. Ericsson's participation in Russia's Skolkovo Innovation Center formally announced after meeting between Swedish and Russian prime ministers.

www.i-gorod.com

II Obninsk Innovation Forum

II Obninsk Innovation Forum will take place in Obninsk May 19–20, 2011. The event is organized by Marchmont Capital Partners, The Government of the Kaluga region, Obninsk City Administration, Agency of Innovation Development - Center of Cluster Development of Kaluga Region.

www.marchmontnews.com

eLearnExpo 2011

8th International Exhibition and Conference eLearnExpo will take place June 7–8, 2011 at Expocentr, Moscow. eLearnExpo has enjoyed the position of being the first and only international exhibition and conference in Russia and CIS for professional training and learning with focus on enterprise but with solutions for academic and public sector.

The exhibition features over 40 exhibitors from around the world demonstrating their latest platforms, methods, tools and content for e-learning in education and the enterprise. A two day conference held alongside the exhibition includes master classes, workshops, round tables and keynotes by the leading experts.

www.elearnexpo.ru

Country Without a Functional Innovation System Is Lost

Sven-Thore Holm — Founder of IDEON Science Park, CEO at Technology Transfer Foundation, Lund

Being a founder of IDEON Science Park, could you please tell how it all started?

We started in 1983 in a medieval city of Lund because it is a scientific center of Southern Sweden with a huge university with 45 000 students and 7 000 people involved as teachers and researchers. In a tiny city with only 110 000 people everything is very much about knowledge, innovation, industry, science, new companies, economic development. From the very start we involved major Swedish industries like Alfa Laval, Tetra Pak, Gambro, AstraZeneca.

Around that time, the Skåne region suffered from recession, and a large number of basic industries such as shipbuilding and textiles, were hit by closures. We had the best shipyard in the world – Kockums, but it could not compete with the Koreans, so it was shut down, together with several other enterprises.

At that time I was responsible for environmental control in connection with industry. The government said: "Since you know something about our industry, we would like to see you as a manager of a new thing there. We are going to develop a brand new industry based on science, technology and knowledge in general generated by the Lund University". The purpose was to take advantage of the expertise that existed at the University and to create new growth companies with local ties, thus increasing the employment level in the region. Inspiration was taken from the USA where similar activities had been successfully operated for some years. The concept was adapted to Swedish conditions and the work on creating the first science park in Scandinavia commenced. The site was chosen adjacent to Lund's Faculty of Engineering and, starting in September 1983, the first five companies moved into Ideon. It was rapidly growing because there were a lot of people with bright ideas and each year we were adding about 20 new companies. During its first 27 years, more than 800 companies have operated at Ideon Science Park, 76 per cent of them have, over the years, had some kind of close connection with Lund University. The survival rate has been excellent and, in during almost three decades only about thirty companies have had to close down.

Then we started to do this in connection with other universities as well. In 2005 it was all transformed to a national company "Innovation Bridge" which now has its headquarters in Stockholm. Innovation system is really a part of a brand new infrastructure. It's more valuable than highways and motorways, and things like that. I usually say that a country without a functional innovation system is lost.

What government agencies are responsible for innovation policy in Sweden?

Within the government it is the Ministry of education and research – they are heavily involved and they set the budget for it. Then we have agencies like VINNOVA and the other one, the Swedish Agency for Economic and Regional Growth – Tillväxtverket which deals with small and medium size companies. We have universities, institutes and, of course, our industry. "Innovation Bridge" is dealing with commercialization.

The problem is to explain to high-level politicians what's the difference between inventions and innovations. Inventions in most cases are scientific findings with no value. Innovations come when you have it on the market, when you earn some money or somebody is using the results of the research. And suddenly you have a value for society or for business. To turn inventions to innovations – that's now my business.

How can that be turned into economic growth? We have been dealing with this for two decades, trying to learn what works and what doesn't work. We have been around the world several times trying to follow what people are doing in other countries. The first step is to acknowledge that a full scale innovation system is a vital part of modern infrastructure. I've been to Russia several times. I tried to convince your colleagues which proved not easy. Take the Skolkovo project: you are trying to attract foreign investors, Microsoft and companies like that. While here in Sweden we are turning our own efforts into research and development, so that our own companies could go global.

Nobody in my neighborhood here owns a single Russian product. It doesn't exist though it could. So, the problem for Russia is that you have no system to turn your own knowledge that is brilliant into globally traded products. Instead of attracting already existing foreign companies you should concentrate on developing your own ones. That must be a political commitment on federal, regional, local levels, and they must play the same game simultaneously, in the same direction with the same goal, and it must be run on a professional basis.

What should be the starting point?

We have created what we call innovation chain here starting with feed stream. You have to have some feed into the system, you have to have some professional coaching, some soft financing, patent licensing, equity – things like that. And feed stream in our country starts with increasing of the entrepreneurial spirit to get more people to think in terms of doing more than they usually do. Creative thinking starts with education. In a traditional schooling system the mind will more or less be spoiled. They tell you "Read this, do that calculation!" The imagination just disappears. We teach creative thinking in fourth grade here to get the mind going. In remote areas we use Internet. Then at the college level we have national and regional competitions for students in

creation of true business plans. I'm a chairman of Swedish Venture Cap system. This is a competition, which starts in September and goes for a year until June next year. Yearly we involve about 1000 teams each consisting of 2 to 5 people. And we are engaging all 40 universities of the country. During the last 10 years we have educated more than 30 000 people and now we see almost 6 000 brand new companies coming out of that. And even if they didn't start a company it was still good for their future whatever they are doing.

And, of course there is a need to establish financial structure for scouting inventions on the university level. You need to know who is doing what and why, whether there is a commercial potential. You have to organize a TTO – Technology Transfer Office. You have to hire people with industrial background. Then we come to physical structure. We have in Sweden a national incubator system. In incubators potential entrepreneurs find professional business and education support to turn paperwork, a business plan into a working company. And this would take from 6 months to 5 years depending on what type of company you are trying to establish. In most cases incubators are located in science parks because when startups leave an incubator they can grow and expand there, hire more people and in few years some of them would even outgrow it and move out.

Then you have to have a financial toolbox to support it all. We have an opportunity of getting grants, but first you need to verify scientific findings: is there a commercial potential, is the technology working, who is going to run it, is there a market? A lot of money so far comes from government. We have soft loans for startups and we have early stage equity where we buy parts of a company. If you are doing this properly you will have a manifold payback, so it's not a cost but an investment.

I see Skolkovo as an investment project. And I would like to see Russian people to invest and to be invested in there. When we were at a Global Forum there was a person from Israel and he just stood up and said: "I would like to thank the former Soviet Union and Russia for one million people that have been expelled because they are the engine of our economy". And they are skilled, well-educated and entrepreneurial people. They could have done this in Russia but where is the mechanism? I know that feed stream in Russia is good, your education is great, people are great, but the coaching needs be improved.

What is the role universities play in innovation process?

Well, there is legislation here, which tells universities that they have three tasks: education, research, and distribution of knowledge. They have to package things for the benefit of the science. I'm hired by a university, and we have a huge project which we call "Experts for hire". So, the university is going to be turned into a major consultant organization of 9 faculties, so that we can sell people from 9 faculties to industry, to the society in general. For the first time we found the way to distribute all the knowledge inside a university on a commercial basis.

What are the latest trends in the Swedish innovation policy?

The latest trend is that the government at this very moment has started a new agenda called "The new innovation strategy of Sweden". It's a matter of collaboration between ministries of education, industry and finance. This will be launched in December this year. The purpose is to further improve the national innovation system even though we are considered to be one of the most innovative countries in the world.

What helps and what hinders the development of the innovation system?

One of the problems which goes around the world is the lack or scarcity of private capital in the early stages because people are afraid to invest too early. It must be a part of a national policy to do that. Our structure of venture capital is that you are investing in 10 projects and within couple of years half of your investment is gone down the sewer together with the projects. You are lucky if two or three will pay their own cost. And you are even luckier if one or two will pay back. In China such things are impossible because Asian mentality does not accept failure. But in venture capital business it's normal that you fail here and there, and return all your losses in one or two cases of success.

How important are science and technology parks?

I would say that such parks are important, and Sweden has about 38 or something innovation parks around the country. I'm talking of the kind of the innovation parks like Ideon involving different companies. They are meeting places to get people together, to create the crossroads where people with different backgrounds meet – lots of people who never knew each other before. They meet, they talk, they start planning together.

What is your forecast for the development of the innovation system in Sweden?

Innovation will be a core political theme. Sweden is not living on oil or metals. The development of this country is based on sophisticated industry and products with a high added value. That must be interesting for Russia which is now trying to turn from an economy based on commodities to the one much more based on R&D, and we are looking forward to future Russian products which we could buy as easily and cheap as Chinese.

What research and technological achievements may assure a breakthrough in the years to come?

I think the major investment is around the European Spallation Source (ESS), which is a major investment in the world. It is the name of a materials research facility for scientific research using the neutron scattering technique. The facility will be built in Lund, starting in 2013 and is expected to open in 2019 and to be fully operational in 2025. Research on materials will be done as part of the scientific front line in energy, telecommunications, manufacturing, transportation, information technology, biotechnology, and health. ESS is a multibillion investment project and it is going to become ten times more powerful than facilities in the US and Japan and it will provide the users with a 100 times better experience than present day neutron sources. From that a lot of new inventions will come, and innovations, and companies and in the end economy. And in connection to that Lund will establish a scientific city like Skolkovo based on these major investments and will let start hundreds and thousands of small companies based on national investments in education and research. Tradition of the city is to stay on a frontline of the knowledge.

Laws that Hamper Swedish Innovations

Henric Rhedin — Associate Professor and Division Manager, Commercial Research & Development, Stiftelsen Chalmers Industriteknik (Chalmers Industrial Technologies)

What are the specifics of the innovation system in Sweden?

In the public research sector Sweden has always been working only with spin-off creation and never with other forms of utilization like licensing. This is partly due to the fact that teachers at universities own their inventions, and the general exaggerated belief that inventions have a value before they are innovations. Sweden has focused on spin offs from universities since it is simpler to offer the researcher ownership of a company in exchange for the IPR.

The problem with this system is that research based innovation never leads to employment since research is narrow. The system is a technology push model where inventors run around looking for problems that their invention can solve. Research based inventions are 100 percent of the time just a partial solution or serve just a partial need. Hence, spin-off company based on a research invention usually gets acquired by another company. Note that Google is not research-based innovation, it was student based. Cisco was created by two people solving a practical problem at the university and not related to research. There are many examples where universities have been involved in creation of large companies but there have rarely been any research results involved in the process.

The positive side is that a spin-off can be viewed as a nice way to package and sell IPR. But politicians in Sweden are stuck with the belief that those companies will grow into large companies, which will never happen. Also, the strategy for running a company that should be sold and the strategy for running a company that should grow are very different, and hence resources are wasted running down the wrong track. Furthermore, most of the time the IPR is much better suited for licensing but researchers don´t understand licensing, licensing is rarely efficient for a one patent perspective etc.

In the private sector very few companies have capability of handling intellectual assets, and if they have any awareness at all they are often stuck in an old fashion patenting model. Ericsson is the only exception where the management has strategically chosen a more modern path of patenting and applying licensing to their portfolio. The licensing part of Eriksson´s operation is the most profitable part of Ericsson counted per capita. Other companies like Volvo, Astra-Zeneca, SKF etc. still apply a very conservative "patent to protect" business model although they are getting increasingly interested in open innovation models and similar more modern concepts.

What legal regulations promote or, to the contrary, hinder innovation process?

In the university sector the teacher exemption, that the teachers own their own inventions, sets the boundaries for the system of handling intellectual property at universities. In Sweden the law gives the inventor ownership to their inventors but if the inventor is employed the employer has an option to acquire the invention. At universities there is an exemption that nullifies this option for teachers not researchers. This exemption was introduced in 1949 to prevent commercialization of teachers' knowledge. Some 20 years later this was expanded, not in the law but by practice, to include researchers.

Another explicit legal regulation is the public availability act that essentially prevents universities to sign non-disclosure agreements. This hinders efficient collaboration between universities and industry since industry often requires secrecy agreement that university lawyers refuse to sign.

In the private sector the public procurement regulations gives a climate that hinders small innovative companies to enter the market. The procurement is bureaucratic and prevents new solutions and introduction of changes. In, for example, the medtech sector there are very few centralized customers, the hospitals that are run by local authorities, and those are often unwilling to try new solutions when old ones are good enough. If there is an opening for a small company, the procurement process is long, tedious, and SMEs often run into a cash flow problem during the time.

What are the major participants in the innovation process in Sweden?

The innovation process includes actors from all sectors, as it should. They, of course, act from their own perspectives and with their specific goals and incentives. Sweden has a large number of international companies like SCA, Volvo, Astra-Zeneca and Tetra Pak that represent a number of industrial sectors. There companies have interaction with research institutions and also collaborate in between themselves and with their suppliers in innovation activities.

The research funding agencies have different roles and perspectives on innovation. VINNOVA is the only agency that has innovation as a part of their mission in a clearly communicated way. I believe that we have to strengthen the funding agencies role and responsibility for utilization of research, not only for research itself. This has to be an integrated process and research funders can and should demand better results from universities when it comes to utilization. This depends on the development on criteria for evaluation and indicators that has to be developed.

The various government ministries responsible for industry, finance and education participate and support the innovation process in an active way. Organizations that work to change the prerequisites for innovation, technology transfer and entrepreneurship include SNITTS (Swedish Network for Innovation and Tech Transfer Support), IVA, and others.

On the public side the production facilities like universities, university colleges, and research institutes are important in knowledge transfer, creation of high tech spin offs and education of people. Science parks and incubators work often in close proximity of universities and university colleges and for important interfaces and infrastructure for industry-university collaboration.

How important is the role of government compared to that of the market forces?

The Government and its instruments like research funding agencies can influence via legislation, incentive programs and support structures, and driving the debate but as always the market forces drive innovation, which lies in the definition. The balance between interfering and facilitating is difficult but in my opinion Sweden has unfortunately a flare for constructing around problems rather that solving the problem itself. We are most hesitant to change laws that prevent innovation and rather try to create support and provide funding that in government theory should solve the issue. We are too careful in Sweden to be politically correct and have to investigate all aspect before we reach a consensus decision.

What are the latest trends in innovation policy?

Which policy? Referring to the above mentioned cautiousness and our strive for consensus puts a wet blanket over all efficient processes. Since everybody has to be involved and all aspect has to be covered this means that a truckload of well-known persons without real knowledge of what innovation is has to be involved in the process with obvious result. Service innovation has rendered a great deal of interest lately and resulted in a Service Innovation Strategy.

The EU commission recommendation that appeared in 2008 for IP handling at public research organization was for a long time treated as a hot potato that nobody wanted to handle. Due to pressure from the EU this has finally appeared on the agenda and may lead to something.

What may be achieved through these changes?

Since consensus is the only measure of success, and since people delivering strategies doesn´t understand the real work and do not connect to practitioners, I have low hope for getting results that really make a difference. What may influence things in the right direction is the increasing internationalization and increasing awareness of international abilities, which is an important task for SNITTS.

What helps and what hinders the development of innovation system in Sweden?

We have in Sweden a well-developed system with Science Parks and Incubators that handles spin-offs from universities in a well established and orderly way.

The funding system is fairly well developed. There is funding available for “verification” which is the phase where research inventions are evaluated with respect to utilization possibilities. We have a developed system for seed financing and there is also funding available for established companies etc.

Luckily the innovation strategies and policies doesn´t affect industry too much, so the damage is limited. We have challenges at several levels ranging from leadership issues at all levels from government to university management. There is no clear idea about what to do, how to do it, who is in charge, and when to do it. Other showstoppers are the things mentioned above like teachers’ exemption and other legal obstructions. There is also a lack of incentives at many levels for example at the peoples level since we are a wealthy nation and people hence lack the poverty incentive.

In which areas the results of innovation have been most impressive?

In the private sector where there are plenty of Swedish companies that are results of innovative processes. The so-called innovation system is non existing since we have only fragments of a system and only components that work well. The system has accomplished nothing so far. As mentioned above, the spin-off creation component of the federal system is successful in creating spin-offs (but only a subset of the system) although they have not created any economic growth so far.

How do you explain it?

The driving forces are more clear in the private sector. Companies have to be innovative in order to survive. The so-called innovation system has a university focus and a focus on spin-off creation and it is clear that no spin-offs should ever be created from research based innovation. Research based innovation very rarely leads to large companies.

To the contrary what were the areas where innovation failed to produce breakthrough despite efforts so far?

Research based university spin-offs has not delivered any substantial economical growth at all despite large programs. They are successful in creating a large number of spin-offs but the companies in general remain small or get acquired by larger companies.

What is your forecast for the development of innovation system in Sweden?

The optimistic scenario: SNITTS grows to 1000 members and becomes the meeting place for TT and Innovation issues and possibilities. There are several legislative changes including the teachers exemption changed into university ownership of employers’ inventions. Licensing is developed as a tool and starts getting used as the dominant model for exploitation. Spin-off creation is developed to focus on non-research ideas e.g. student ideas. Universities start realizing that they should work with companies in order to let the companies grow. Companies, universities, research institutes begins dealing with intellectual asset management.

The realistic scenario: Business as usual, i.e. nothing much of value.

Innovation Culture of Business Incubators

Jonas Michanek — Associate Professor and Division Manager, Founder and Owner of Idélaboratoriet

What is the role of your company regarding the innovation process in Sweden?

My company is Idélaboratoriet (Idea Lab) and it's a consultancy working with innovation and creativity. The purpose of Idélaboratoriet is to give value to our customers by consulting organizations in the areas of idea-, creativity- and innovation management. When we started in the middle of the millennium festivities of 2000 no one was talking about it. And today it's everyone's talking point. Even President Obama in his State of the Union address said that the only thing that can save America from a debt crisis is innovation.

We work with an early phase in all kinds of industries, with customers from Carlsberg, Tetra Pak, Sony Eriksson etc. We worked with the city of Malmo, for example. Social innovation has become a hot topic and now municipalities, cities and states are also coming. But we mostly work with the private companies.

What are the major players on innovation scene in Sweden?

I would say the major players are mostly the companies. You can say how much you want of state funded, university-funded innovation, but innovations happen in companies and not in state organizations or in universities. In this area – the southern Sweden – historically we have a very interesting IT and telecom cluster and now it has grown even more. Here, just in this house, several companies have been bought by Apple, by Blackberry and so forth because local enterprise are very good at producing interaction, design and new services for mobile phones. So, I would say the major players are usually big companies, which in their bigness create clusters around them. That's more important than all universities and state funded initiatives you could find.

I think culture also is very important. The culture we have in Sweden is very good for innovation: it's very free; it's very open; it's very tolerant; it's very curious about technology and so forth. That fosters innovation.

What else makes Swedish innovation system distinct from other countries?

I think Swedish culture and Swedish innovation system are not so bureaucratic. People talk less and act fast. People are open to new ideas. That's, probably, the most important thing. I worked all over the world – in all continents except for South America, and I have to say it is really easy to work in Sweden. Well, I haven't worked in Russia, but I have worked in Europe and it's tough to work in, for example, Italy, which has a very hierarchical structure in organizations. Usually it's easy to work in the US because people speak freely there. It's hard sometimes work in Asia, at least the way we used to, because people don't say anything. They are scared to say a wrong thing. But, on the other hand, when it comes to conceptualizing and making things happen they are really good. China has a fantastic production potential but when it comes to innovation, it will take a lot of time for them to get new ideas, they aren't used to it, because for the last century the people have been penalized for having ideas of their own.

If you compare that to Sweden, Sweden is really open, it has flat organization structures. You don't have to ask your boss a permission to have a new idea. So, that makes kind of a distinction.

What is the government's role here?

The government's role is mostly to be kind of a backbone. One role that has, probably, become more and more important, especially after the financial crisis, even though Sweden wasn't hit that hard, is seed funding. When times are bad, the venture capitalist moves away from seed funding. This is really a good example of what states can do. And also business incubators. I was a part of European benchmark for business incubators and I've seen so many really bad examples of incubators. But this one, MINC/Malmö Incubator is really a good example and it is based very much on culture, on creating a right culture from the start. There are no long corridors with closed rooms. The atmosphere is very open and they choose right people, right companies. That is what fosters innovation in the early phase – the right culture and the place, and now it's a success story.

Are you speaking about this particular business incubator or about Sweden in general?

I'm talking about this one. I wrote a report to start this incubator 10 years ago. They asked me whether I wanted to lead it, but I said I wanted to keep on running my own company. But we've been sitting here ever since, and I can't take the credit for this but it has been a great success. They started with two floors here and now it's the whole building. This is one of the biggest incubators in Sweden.

What was the initial idea you sold to these people?

It was just to start an incubator, but I also was thinking about what could be around it, both virtually and architecturally, what it could look like, what soft principles there should be, culture parts but also different industries that they could focus on. First it was very open but then we started focusing on design. They had one floor where there was only design, one floor where there was only IT, and then it started mixing up and now they just go for good companies. It's been a big discussion about the incubators – whether they need just to focus on one thing and not to do the other. Sometimes that might be right depending on the environment. But I think, it's important to reach a certain critical mass. If there are just three companies sitting and there is no energy – it doesn't work.

If you talk about my company – the Idélaboratoriet – our role is, probably, to be a facilitator of creative processes in companies and organizations. We are both the spark and the oil, someone who starts things in different organizations.

What distinguishes "good" incubators from "bad" ones?

I would say the good incubators in Sweden are the ones that have been good at creating their own cultures, as I said, innovation culture, not being too closely linked to universities, just being part of another corridor. For example, incubator next to IDEON has been a big failure until lately. It was just too close to the university. They were not really entrepreneurs. I saw too many university incubators that were really bad. I mean, business incubator should, probably, be close to university but not let university people run it. Entrepreneurs and people who understand business should run it. Otherwise it will become another boring corridor.

Apart from business incubator you have here, are there any other examples of successful incubators in Sweden?

Yes. There is a good virtual one, it's called Sweden cleantech incubator. It is a virtual incubator that supplements regular incubator programmes by adding a cleantech focus to business development. They also provide support with marketing, competence development and finding financing.

Did the government in Sweden feel it necessary to put forward any specific legislation to promote innovation, or was it less bureaucratized?

When it comes to innovation, laws aren't, probably, a way to go. A lot of good things have come up when boundaries have been created. For example, when oil disappears it's going to be a great innovation spark to all other kinds of energy. So, boundaries can be good for innovation but laws – I'm not sure. Have there been created many laws around? They are discussing different kinds of economic incentives. I know they are discussing taking away the taxes for early phase investments and so forth.

So, it's mainly about budget and taxation?

It's such a broad question. For most entrepreneurs money is not the main driving force. It's a vision and the ideas or doing something new. Some entrepreneurs are there only for the money. But most innovators and entrepreneurs aren't. It's more important to create a possibility to dream and fulfill the dreams than make a perfect economic structure for it.

Compared to what it was some years ago, how did the innovation landscape change? What were the major trends?

One of the major things that happened on the overall scale is that Sweden has been a country built on very big companies and big companies has always been the finest thing. The last 20 years both politicians and the overall media climate have changed to make small entrepreneurs the heroes. And I think that's a very important shift. The ministers and the government instead of talking of small entrepreneurs as of people, who are trying to skip taxes, are now praising them for creating jobs, promoting innovation. Young people today perceive creating their own companies as something much more possible and fun way of building their future before seeking a next job at IKEA. That's also a big shift in attitude. I think that is very important for the future of Sweden.

What are the major incentives that help the innovation process and what are the obstacles?

As an entrepreneur, I would say, one of the economical things that might stop people is that it's still expensive to employ people here. It's much more fun to be entrepreneurs, to do own thing than just go to a big company. I think it is really very important to show the good examples, and we had some really good examples in Sweden like Skype, and you can see that it's fun to create companies and you can also make money. But I don't think that's a big driver. I think the big driver is that people have a chance to do their own thing. Entrepreneurship and innovation is a good way of doing one's own thing.

What are the obstacles? Small market?

I think Sweden is good in the sense that it is a small market because it's easier to get things going. Competition might be not that hard. On the other hand, we have always had a problem with scaling up. What is happening is that small companies are being bought by, for example, American giants

INNONEWS

The Second EU-Russia Innovation Forum in Lappeenranta

The Second EU-Russia Innovation Forum will take place in Lappeenranta, Finland May 25–26, 2011. This annual innovation and modernization event between the EU and Russia gathering over 600 company representatives and decision makers engages business leaders, financers, researchers & policy makers in the cooperation to build the global competiveness of Europe and Russia. Some 300 Finnish, European and Russian companies interested in modernization opportunities are expected to attend the forum.

www.eurussiainnoforum.com

Conference "Russia's Regions: Strategies and Mechanisms for Upgrading, Innovation and Technological Development"

VII International Scientific and Practical Conference "Russia's Regions: strategies and mechanisms for upgrading, innovation and technological development" will be held May 26–27, 2011 at the Institute of Scientific Information on Social Sciences of the Russian Academy of Sciences.

www.i-russia.ru

"Focus on Russia: Innovation Ways" Seminar on Russian Pulp & Paper Industry

SPCI WORLD PULP & PAPER WEEK will be held in Stockholm May 17–19, 2011 by RESTEC Exhibition Company and Adforum Company. Within the framework of the exhibition on May 18, 2011 RESTEC Exhibition Company will organize a seminar on the Russian pulp and paper industry "Focus on Russia: Innovation Ways". The discussion will focus on the current situation in the industry, issues of innovation and prospects of international cooperation, based on joint projects.

www.rysslandshandel.se

because we can't really scale it up. And people have called it the Swedish paradox – we are good at having ideas but we are not so good at making big money out of them. But on the other hand I'm not sure that's a bad thing. Maybe that's our role. Maybe we should be the ones to have the good ideas and create start-ups. We just have to be really good at charging a fair amount of money when we sell our ideas. Maybe that's our role in global innovation system.

Can you figure out, perhaps, some areas where the results of innovation were the most remarkable?

The obvious thing is the way smartphones and social media are now changing our society. I don't even think we even grasp the start of it yet. This is, of course, a major thing that is happening. I like the way packaging has changed, and the way they work with nanomaterial, and we have been working a lot with Tetra Pak. But also the environmental side of it, of course. I live in a house near here, and we recycle everything. Just two years ago I lived in another house here – we recycled nothing. I think the whole recycling and environmental science is going to have a huge impact on the way we live. What else? I'm really fascinated by the function of food sector as well – the way we are producing more and more food products that are highly innovative. We worked with some companies in those areas, and it's fun to be close to consumer and, at the same time, you are very close to high tech research in biology and technology.

Perhaps, there were some areas where innovations failed to despite all the efforts and money spent?

I would say that biotech industry is one of those bubbles. The IT bubble, probably, wasn't a bubble when you see it in history because IT is everywhere now and it has definitely changed our lives. The biotech was supposed to be the same thing and that hasn't happened yet. I mean we haven't gone into a DNA structures yet to change different things. Yes, we cloned a sheep but it hasn't really mattered anything yet. So, the biotech is waiting something to happen. It hasn't but it could and it can, probably, be huge. What else? I would say both the car industry and aviation industry. Probably, something is happening now but it has been a big disappointment so far. I mean, we still pretty much using the same amount of oil for driving new cars. 20 years ago they started talking about lowering the gas liter per mile. We did a little but it's still pretty much the same. That's a big disappointment to me.

Being part of it, how do you see the near and a more distant future of the Swedish innovation system?

I'm a staunch believer in innovations, and I think it's going to bring us the future. But when it comes to a national scene, we had our first innovation strategy in 2004. It was very fluffy. And we have been waiting since then to have a more clear strategy for Sweden. For the last two years we have been listening to the government promising to deliver it, now it says they may need two more years. So, that's one thing we are looking for. Another one is, I think, cleaning up the innovation system. There are too many state initiatives with similar roles and too many small players. In this region there are about 30 different agencies to promote innovation and most of them are doing pretty much nothing because their budgets are very small. So, they are just trying to feed themselves and therefore they don't really have time to help other people.

What would you like to be achieved through the initiatives you've mentioned? How would you put the aim of these processes?

You probably could measure how many new companies have started, how many is being helped throughout the process. I sometimes think that part of this state funding should just be put into another seed fund to make it go straight to the companies, so that it didn't have to go through 3 layers of bureaucrats before it reaches the persons that are supposed to have it in the beginning. So, I would like to reduce the layers in the innovation system and measure how much money goes to business innovation compared to how much money goes to the bureaucracy creating that system. Even though, as I said before, I don't think that Sweden is exceptionally bureaucratic. Still, there are a lot of things to do. And we are also a part of the EU, which is a very bureaucratic system, and I think a lot of layers in the EU should be cleaned out as well.

INNONEWS

Round Table "Development of Mechanisms Facilitating Access for EU R&D Organizations to Russian Research and Innovation Programmes"

to Russian Research and Innovation Programmes"

Round Table "Development of mechanisms facilitating access for EU R&D organizations to Russian research and innovation programmes" is organized by ACCESSRU project, and will take place May 31, 2011 in the Moscow office of the Delegation of the European Union to Russia. The goal of the Round Table will be to discuss in more depth existing access mechanisms and to finalize the strategic recommendations for facilitating European researchers' entry into Russian national programmes.

www.fp7-bio.ru

Attracting leading scientists to Russian universities – 2011 Grant Competition

Grant competition of the Government of the Russian Federation is designed to support scientific research projects implemented under the supervision of leading scientists at Russian institutions of higher learning. The RF contribution is 150 million rubles (about € 3,500,000). The duration of the research project is 2–3 years. Main task is creation of a research laboratory of international level in the university. Deadline is June 16, 2011.

www.eng.mon.gov.ru

International Exhibition and Conference on Energy Efficiency and Saving ENES 2011

International Exhibition and Conference on Energy Efficiency and Saving ENES 2011 will take place in Moscow (Exhibition Centre) May 24–26. ENES 2011 will provide insight into and give an evaluation of the market conditions for energy efficient and saving technologies, equipment and services, reveal development trends for this market in various regions, organize a dialog between the business and the authorities.

www.eng.spb-venchur.ru

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