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MAIN SUBJECT

PUBLIC INNOVATION POLICY

Innovation Approach Needed to Create Unconventional Institutions



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What do you think are the most and least successful examples of innovation-oriented policies in the world?

The term “innovation” has many meanings; it needs to be clarified. The Federal State Statistics Service differentiates between advanced production technologies that are new for Russia and those that are totally new. Totally new means ones that have been developed for the first time and have no substitutes anywhere in the world. And new technologies for Russia mean ones that have been essentially borrowed from other nations. In 2007, Russia borrowed for the first time 653 advanced technologies, and developed a mere 75 totally new ones.

If your objective is not to amaze the world but to improve performance and therefore living standards, you can opt for borrowing rather than developing new technologies. Moreover, if a country lags behind in technology, it usually finds it much cheaper to borrow. Advanced nations, on the

other hand, are limited in their choices of borrowing; they are forced to develop totally new solutions.

The most successful among such nations is naturally the USA. The Americans have developed an effective mechanism for generating and implementing innovations from fundamental research to commercialization and to retailing. It drains brains from all over the world, enticing researchers with high compensation packages and comfortable working and living conditions. Using venture funds and a well-oiled stock market, it skims the best projects. They know how to commercialize the products and solutions developed. The USA supplies innovations to the world at large, and the world pays for their development by putting its savings in dollars. This is an example of the best innovation-oriented policy.

Economic-miracle countries, such as Japan, South Korea, Taiwan, as well as Finland and a number of other economies, use sophisticated innovative strategies. To begin with, they imported foreign-made machine tools and equipment, then they bought patents, set up their manufacturing facilities, and forced out imports. After that they committed to exporting, gradually upgrading their products and switching over to high technologies. And only then they did opt for innovative growth. These nations provide examples of successful innovation policies. But there are many more nations that have failed.

Why?

They failed to follow the correct sequence of switching. A case in point is Brazil, which is not the most backward nation in Latin America, not by a long shot. Brazil is growing at a fairly good rate. But there has been no leap forward in Brazil, as there was in Japan, as there was in Taiwan and South Korea, because it has failed to come up with the correct strategy.

It must be emphasized here that a successful strategy at each stage of development has both distinctive macro-political features and specific methods of government intervention. For example, small businesses play an important role at the stage of innovation-driven growth, typical of advanced nations. And major corporations are much better at arranging borrowing.

Sometimes we hear even from, one would think, the authoritative lips of spokespersons for the World Bank that all Russia's troubles come from the insufficient number of

small and medium-sized businesses in Russia. But history and theory provide evidence to the contrary. To be sure, we need to support small businesses. But we should not expect them to become major drivers of economic growth at this juncture. At the stage we are at this role must be played by major economic players.

What are the latest changes in innovation policies in the world?

As a crisis management measure, developed countries have increased expenditure on fundamental research. First of all, they have increased expenditure on the development of nanotechnology and energy-saving.

mechanism. But what we need is exactly an innovation approach to form unconventional institutions to ensure effective borrowing. Borrowing is far from simple. Had it been simple, there would have been no developing countries left by now: they would all have become developed.

What research and development areas do you see as enabling a leap forward? Which ones can be expected to deliver the next technological breakthrough? After all, many believe that one of the causes of the crisis is the end of the previous technological cycle.

investing in new technologies, first of all in nanotechnology. It looks like nanotechnology is precisely the future technology of wide application. Experts say it will take quite some time for them to fuel new growth – up to ten years. So we shouldn't expect Western economies to grow at their former rates in the nearest future. More or less a similar situation prevailed after the '30s crisis, with the aftermath of the crisis casting its shadow over an entire decade. And after the war the era of new technologies began, and eventually they pushed the Western economy to a new level.

Russia must find an institutional structure that would enable effective borrowing and a gradual transition to innovative growth. In my recent articles I have attempted to outline such a structure. It is based on the experience of the economic-miracle countries and factors in the development mechanisms that have emerged relatively recently. Its further elaboration is the subject matter of a multi-author book which I have edited, which is scheduled to appear in September. It is called "A Strategy for Modernization of the Russian Economy".

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As early as 2000, by way of response to the crash in the market for securities of high-tech companies, the USA launched its National Nanotechnology Initiative. The President has a National Nanotechnology Coordination Office. In the European Union, nanotechnologies take a place of prominence in the EU's [Seventh] Framework Programme for Research and Technological Development. But developing economies should have a different strategy. The global crisis is creating good conditions for import substitution and acquisition of marked-down solutions, for recruitment of experts who now find it more difficult to get jobs in their home countries. China is very active in this respect.

Does Russia have an innovation system, and what are its distinctive features?

Of course it has. We have been very busy these last ten years in setting it up. And it is in a very sorry state because it was built without rhyme or reason. It is a hotchpotch of various institutions set up by blind copying of Western ones.

It's a catch-22: we copy institutions in hope of acquiring an innovation

I do believe that new technologies must come into being: ones of wide application, i.e., technologies that can be integrated into a wide range

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of industrial applications, becoming a driver of economic growth. In the same way as, say, the computer was integrated.

Old technologies of wide application, such as the computer, the Internet, are gradually exhausting themselves. It means that they can no longer provide a platform for rapid growth of advanced economies. In the final analysis, this is what triggered the crisis, which actually started not in 2007-2008 but as early as 2000, when a crisis occurred in the hi-tech market.

The Western nations seem to understand this. Maybe this hasn't been made explicit in so many words, but they are doing exactly what needs to be done. They are

The keynote of the proposed strategy is as follows. In order for Russia to join within the next 20 years the group of developed economies (in terms of per-capita GDP, this means at least 50% of the US level), it needs a system of interactive growth management. Its major components are a system of regional agencies for interactive planning headed by a federal agency; a national innovation system, geared up for borrowing with a gradual shift towards innovation; and macroeconomic and foreign-trade policies aligned with the development objectives.

He Invented a National Innovation Economy



Prof. Bengt-Ake Lundvall – Professor of Economics in the Department of Business Studies, Aalborg University, and Special Invited Professor at the International MPA-program at Sciences Politiques, Paris. In the eighties in collaboration with Christopher Freeman Prof. Lundvall developed the idea of ‘innovation as an interactive process’ and the concept of ‘national system of innovation’.

In the 1980-s, together with Christopher Freeman, you have developed the concept of National Innovation System, a term that is widely used today and defined differently. What made you research this particular topic at first place?

Most important was the analysis of innovation process at micro-level where we found that innovation is an interactive process. For instance, we illustrated this by the interaction between producers and users of product innovation. At the more aggregate level, we found that national economies with investment in science were not necessarily innovative. Such paradoxes could be explained by the fact that innovation involves interaction and communication with feedbacks. ‘The quality of relationships’ between agents and organizations is crucial for the performance of the system. It is not sufficient to enhance effort or performance of the single elements if the interaction does not work well.

What is innovation system to you? How do you define it?

I sometimes operate with two different definitions: a core and a wider setting. The core includes the firms, their mutual interaction and their interactions with the knowledge infrastructure. The wider setting includes education and training, access to finance and the public sector, including regulations and welfare state. If you want to understand the impact on economic growth you need to take the wider

setting into account. Actually we find that labour markets and education systems are more diverse across countries than are the science systems.

You regard innovation as an interactive process. In what way is it “interactive”?

Almost no innovation comes out of individual effort, and empirical data show that it is exceptional that a firm develops a new product without some kind of interaction with suppliers, users or knowledge institutions. Within firms successful innovation depends upon close interaction between departments for production, sales and R&D.

According to the Lisbon declaration 2000 Europe was to become the most innovative and competitive region of the world with social cohesion. Today, 10 years later, what has changed?

My own opinion is that the policy developed was far from ambitious enough. The first priority should have been to lift the weakest parts of Europe (Greece, Portugal, Italy and Spain) through investments and a more rapid modernization of institutions. The current financial problems that slow down growth demonstrate that the regional inequality within Europe is its Achilles’ heel. The idea that a single market and a common currency was sufficient for economic progress was wrong. The focus on lifting R&D-efforts also reflected a too narrow interpretation of the innovation process. Modernizing education and labor markets should have been given more attention.

What are the latest changes to innovation policy in the world? What do think about the given changes?

The most recent changes are reflected in OECD’s innovation strategy and in the new European strategy EU2020. On the one hand, there is a general trend to broaden the policy to take into account organisational, institutional and demand side factors. On the other hand, the core analysis is based upon narrow economic models such as production functions, and it is assumed that the rate of ‘total productivity’ growth gives a meaningful indicator of innovation.

To your mind, what should be done to improve the innovation policy and foster innovations?

I think that there is a need in general to give more attention to the organisation of work. The involvement of employees of all categories in processes of change enhances both the capacity of firms to develop new products and processes and their capacity to absorb new technology developed elsewhere. This requires reforms in labour markets and education systems. Flexicurity in the labour market and broad and egalitarian access to education and training are factors pointing in the right direction.

What would you call the best and the worst examples of governments' innovation policies?

In Europe I think that Finland is a good case and that the UK is a rather awful one. Finland has a pragmatic approach where the public and private sector interacts and develops a common strategy, while the very negative attitude to the public sector in the UK and the bad industrial relations there hamper the development of balanced solutions.

Could you please give your opinion on innovation policies of the countries you are familiar with?

I have studied China's innovation strategy for some years. China benefits from a rather pragmatic approach, where regional experimentation is allowed and where 'good practice' is diffused through 'policy learning'.

workplace. There has been some successful transformation away from traditional manufacturing toward some high tech sectors. But especially there has been a strong growth in the service economy. I have a feeling that the UK has been more successful in developing new 'business models' in the financial sector than in implementing ICT-solutions in the real production sector.

What research and developments may assure a technological breakthrough in the nearest future? Do you think that such a breakthrough will happen?

Biotechnology is an obvious candidate. But I do not expect it to have as wide and deep impact as ICT. ICT has still a big potential for raising living standards and solve problem - a potential that has not yet been exploited. The most promising

breakthrough could come in relation to low-carbon technologies. But here a common global effort and strong national government intervention may be necessary to trigger and foster a new techno-economic trajectory. This is not different from earlier breakthroughs - it is a rule rather than exception that governments have played a major role for such breakthroughs. This last

option is especially interesting for economic transformation in countries such as Norway and Russia, where the current economy is dependent on the continued use of carbon technologies.

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Over the last couple of years I have collaborated with innovation policy makers in Sweden and Norway. I think that the Swedish innovation policy is too narrowly focused upon the transformation of academic research into innovation and that too little attention is given to the important role of work organisation in connection with absorption of innovation. Norway has recently developed a promising collaboration between trade unions and employer associations regarding a national competence strategy.

What are your thoughts on Russian innovation policy?

I think that the most important weaknesses of the Russian innovation system has to do with 'institutions' defined as norms, rules and relationships in the economy. Lack of trust and irregularities in economic life undermines the capacity of the system to learn and innovate. A strong effort to fight corruption and crime and to establish a new type of collective solidarity is a major task where government needs support from all layers of civil society. There is also a need for a change in the incentive system so that creativity is stimulated among employees as well as among entrepreneurs. Easy access to profit from financial speculation may undermine innovative efforts. Without such changes increased investments in science and technology may not be very helpful.

What are the peculiarities of the innovation system in Britain?

I have nothing original to offer here. In most innovation surveys the UK looks weak and the same is true when you look at the frequency of 'organisational learning' at the

Russia: Innovation System-2



Ivan Bortnik – Chairman of supervisory council of Foundation for assistance to small innovative enterprises

What are the peculiarities of the Russian innovation system?

I would not speak about the innovation system in Russia at least because right now it's in the process of transition from the Soviet innovation system (I completely disagree with the opinion that such a system did not exist in the USSR) to the innovation system that corresponds to the new political and economic conditions in Russia. And I would like to speak precisely about the peculiarities of the transition period.

One must not speak about the innovation system in isolation from scientific and educational systems. And here, of course, it's important to note one of the main Russian (and Soviet) specifics in terms of science and innovation – its concentration of a considerable part of the fundamental research of the country in the system of academic science. Other countries also have specialised institutions for fundamental research (like the Max Planck Society in Germany, the Royal Society in Great Britain, etc.), but everywhere (especially in the USA, Japan, Italy and so on) the greater part of fundamental research is concentrated in universities. Is this a good or bad feature? I personally see nothing bad about it. What is bad, is that this creates a great gap between academic science (fundamental research) and education. This gap was noticed by the USSR, and its disadvantages were understood, and attempts were made to correct them. This involved the system of physics and technology institutions, and the whole of the Siberian Branch of the Russian Academy of Sciences (then, SA (Academy of Sciences) of the USSR) and the strong interweaving of academic research and education in the M.V. Lomonosov Moscow State University and a number of other leading

universities. And later, in Russia, one of the successful programmes was the Integration Programme. I would even go as far as saying that one of the successful structural projects in this direction was the creation of the Russian Foundation for Fundamental Research (and later, on its basis, of the Russian Science and Humanities Foundation), where allocation of grants does not depend on what departments scientists belong to. And the most recent years have seen creation of the St. Petersburg Academic University affiliated with the Russian Academy of Sciences. And by the way, it has recently gained the status of a research university.

Thus, active and systematic moves to form a strong research sector at the universities are a correct and logical step towards the 'linkage' of scientific and innovative activity and education. But I hope that we will be able to do this without going over the top and will retain and develop our peculiarity – a strong block of fundamental science outside universities. In any case in the next decades (at least), while university science is not able to satisfy completely the demand for fundamental science that comes not only from a modern educational system, but from industry, including state defence. And in this sense the aforementioned Academic University is also symbolic (in a positive sense).

A similar specific of this transition period of the purely innovation system of Russia is a very weak development of the infrastructure required for innovation activity. This includes tech parks, innovation and technology centres, nano-centres, industrial parks, special economic zones and business incubators, and centres (offices) for transfer of technologies, prototype centres and other services, an IT and patent services sector and much more. Many parts of this infrastructure did not exist in the USSR and still have not been formed on the scale sufficient for a proper innovation economy. Even the system of tech parks, which was quite well developed in the USSR, was orientated only towards incubation of technologies and not on forming companies for production of new products, and was supported exclusively by funding of the state, and was created only as an adjunct of universities and did not involve academic science. After the state finance was gone in the early 1990s, this system practically collapsed.

The next weakness of the Russian innovation system was absence of venture financing, both on the institutional level (specialised venture funds, marketplaces) and at the level of private persons (business angels). It seems there is some definite progress right now. At any rate funds have been invested into this, including federal, regional and even private funding – and those are not bad sums for a start. But the evolution of the system is taking a lot of struggle. Therefore, concomitantly, the number of venture deals in Russia still does not exceed a dozen per year, but in a normal innovation economy there should be hundreds.

And finally, the main peculiarity of the transitional (I hope)

period of the Russian innovation system, that largely determines both the characteristics already mentioned and others, is the low demand for innovation products from large business entities. It's precisely the scope of such demand and its satisfaction that determines the presence or absence of an innovation economy in a country

I said about collaboration on purpose. The Economic Commission of the UN has recently set itself the task to analyse the problem of the preconditions of innovation in the countries with 'transitional' economies. Experts both from developed and developing countries have been working for two years, the Commission has accumulated a very good range of materials and has released reports. But what is interesting are the conclusions:

- in the countries with transitional economies (including Russia) all the economic players are well acquainted with all of the methods for regulation of levels of innovation (technological) of the economy;

- all the known methods for promoting innovation of the economy in these countries (including Russia) are employed, but the scope of their use is inadequate;

- more or less successful advancement of these countries towards an innovation economy is determined by greater or more reduced collaboration by all the partners in the process, especially at state level. Practically all of these countries (including Russia) lack a sufficient level of such collaboration.

Our problems with formation of innovation infrastructure, a venture industry, special economic zones, FZ-94, customs, the involvement of leading researchers, and the general mobility of personnel are determined only by the lack of such collaboration between state structures. Right now discussion with the Russian scientific community is under way about how to perfect the Russian scientific and innovation system. Look at their suggestions. They are all realisable under conditions of cross-departmental collaboration.

And by the way, the need to eliminate this thwarting factor and gain some experience of an innovation system without it has determined the specific system for management of the Skolkovo project. All the management functions and final decisions have been handed over to a single authority.

But if we are talking of the Skolkovo project in general terms – it is, of course, just an experiment. A large-scale one, but isolated. And anyway this experimental model cannot be launched on the scale of the whole country without 'debugging'. The model provides for creation of conditions within this isolated area that, for the scientific community around the world, will not differ from the conditions of similar centres and other scientific centres. From the point of view of material and technical support and innovation activities, the living and working conditions provided by it, its whole 'aura' for fruitful work and possibilities for contacts with colleagues both in Russia and abroad that solves the 'fatal'

(for Russia) problem of mobility, and the availability of a real and efficient system of intellectual rights protection. It is very important that the researchers of Skolkovo work on a market of scientific and innovation services that is open and is in demand. Therefore, the success of the project will largely depend on attracting large Russian and foreign corporations to this centre.

All of this already shows that the Skolkovo project is isolated only in terms of the privileges provided to its residents. But it was not planned to exist and develop in isolation from the entire scientific and innovative system of the country without collaboration with the scientific and educational potential of the leading universities, academic and industrial scientific centres of the country, 'feeding' from them and transferring into them its positive experience. I hope that there will be such experience. And the success of the entire project will be largely determined by the scope of use of its scientific results and innovative developments in the economy of the whole country.

Does Russia possess enough industrial resources for development of the innovations that are planned to be implemented at Skolkovo and other innovation parks?

More than enough, but only if these resources will be aimed at the take up of these innovations. And even better if they do so by themselves (if they get a slight 'push' in this direction). This will determine the direction of such innovations and indicate what specific products and technologies are required.

What are the most successful and most disastrous examples of innovation policies in the world?

I don't know any 'disastrous' examples of innovation policies. And they can hardly be really disastrous. I like how the venture industry was created step by step in Great Britain. I like the conformity of actions and the result of the 'reforming' of the Finnish economy into an innovation one (based on knowledge). It is interesting to observe how the innovation system is being formed in Singapore and China (first of all in terms of the consistency of actions of all the participants). The French are constantly experimenting (and on a large scale) in this regard. I like the progress of the Kista project in Sweden. And what's most interesting is that there wasn't any particular fuss about it, but its influence on the economy of Sweden greatly outweighs the effect of the similar Sofia-Antipolis project in France. Not to mention the USA, where the innovations are 'bred in their bones', including the 'bones' of many Russian expats. In this sense, the statement of the Americans themselves is interesting, and perhaps, quite clear: they must and do have a state science policy, but don't have and don't have to have a state innovation policy.

Why the State Has to Come Back into an Active Role in the Economy



Prof. Carlota Perez – Visiting Senior Research Fellow at CFAP (Centre for Financial Analysis and Policy), Judge Business School, Cambridge University, U.K., Professor of Technology and Socio-economic Development at the Technological University of Tallinn, Estonia, and Honorary Research Fellow at SPRU, Science and Technology Policy Research, University of Sussex.

Why the State has to come back into an active role in the economy

Historically capitalism has had a pendular behavior in assimilating technological revolutions. In the first two or three decades of diffusion it unleashes the free markets led by the bankers and financiers. This leads to a major bubble which then collapses creating a recessive situation. But by then the new technologies, their organizational paradigm and their new infrastructure have been fully installed and can be used for widespread growth through modernization and innovation across all industries. This has usually required State intervention to regulate finance, provide incentives to production and innovation and create positive conditions for investment in the real economy (instead of in the financial casino that created the bubble). The major golden ages in the second period of each technological revolution have been aided by such interventions.¹

Globalization and the role of governments

Globalization is not about eliminating the national states but about the global distribution of production. The role of

the state in that context is greater than ever because it has to create conditions to attract certain industries and activities and to discourage others, while improving the conditions for the great majorities of its population.

To arrive at a consensus strategy in any country, it is important to have a shared vision of what the country can do successfully in order to have all the agents converge in those directions. Industrial policy is back! The August 7th issue of *The Economist* laments the fact but does acknowledge it is happening widely and cannot avoid recognizing that such policies have had some successes. Each country needs to both solve the demand problem and to decide in what direction to provide incentives for innovation. In particular the developed countries have been losing employment to the emerging economies and, in order to maintain the levels of well being of their populations, they must urgently find adequate directions for respecializing.

Deciding on a general direction for innovation

Isolated innovations, no matter how successful, do not bring economic growth. They need to be embedded in networks of production and systems of innovation and often to be strongly rooted in some pre-existing advantage.

A country with a potentially huge domestic market can use it for employment and growth and to consolidate the habit of continuous improvement, while it further develops its advanced export markets. Employment and decent salaries are the solid grounding of a healthy growth process. Without a well diversified production structure, isolated innovations will not be competitive and will ultimately be absorbed by foreign companies. This has happened to many science-based innovations in England and other countries.

A country with massive natural resources can build on that to innovate in the processing industries and improve its export mix. The more connected that the innovations are to existing industries that are strong and growing, the more likely it is that they will be successful in the longer term and that they will contribute to economic growth and further innovation.

In particular, the development of networks of business services and high-tech engineering around those industries (for example for the various stages of production and processing of oil and gas) can be a source of collaborative innovation. Not only are these services strongly knowledge based, they are also not part of WTO agreements, so that a country has much more freedom in developing these with strong links to the local user industries.

In addition, very large countries have different regional characteristics, resource endowments and specialized skills and experience. This could favour decentralized and multiple patterns of relative specializations providing conditions for dynamic domestic trade among regions. That too could eventually serve as training ground for an eventual export drive.

Radical innovations for the future

The next technological revolution is likely to be some combination of biotechnology, bioelectronics, nanotechnology and new materials, but advances in these technologies will still be expensive and are more likely to be fruitful if they are strongly connected to industries that are flourishing or to emerging demand sectors. Making nano-materials for batteries or using biotechnology to

organization— can be profitable and yield growth for the economy. Learning organizations, interaction in systems, continuous improvement, innovative business models and networks of collaboration between companies can revitalize, rejuvenate and modernize all industries, including the most traditional. And in a country with a massive population such a process of reviving production networks can generate a powerful positive feedback, reviving domestic demand and improving the general standards of living of the majorities.

Globalization is not about eliminating the national states but about the global distribution of production.

The role of the state in that context is greater than ever.

develop bacteria to digest oil spills is more likely to lead to a profitable business than stand-alone products without a powerful target market. When semiconductors were first developed, they were used for military purposes and to make mass produced radios and record players portable. Computers were seen as a big piece of capital equipment for governments or huge companies. It is only when the microprocessor breakthrough is made that the information revolution begins. And even then, it takes a decade before personal computers start really changing production and consumption patterns and another decade before the Internet creates the optimal conditions for globalization. It is very wise of every country to prepare for the next revolution, even knowing that it is not possible to guess in which direction the major breakthroughs will occur. It is a gamble but a necessary one. But those technologies are not likely to represent a significant portion of GDP for a long while.

The main thing to understand is that, whatever you produce — if it is done in a modern way in terms of organization — can be profitable and yield growth for the economy.

Widespread innovation for the short and medium term

In the meantime, the information revolution is there with all its advantages and low cost. It is capable of modernizing and transforming every other industry and helping economic growth. There are many innovations to be made across the board in whatever industry one is engaged in. An obvious direction has to do with the environment, but depending on the country, innovations to cater for old age or to face extreme climates or in the creative industries or connected to the natural resource endowment can also be encouraged.

It occurs to me that Russia has a wide innovation space in facing its specific challenges: distance, climate, etc. I suspect you may need rather specific materials for construction that are durable in harsh climates or special transportation systems. Those are the sorts of innovations that benefit from the domestic market in the early testing period and can open specialized markets for export once they are fully proven and cost-effective.

The main thing to understand is that, whatever you produce —if it is done in a modern way in terms of

«What One Can Do in Russia but Innovations?»



Vladimir Zinov – Doctor of Science in Economics, Professor, Dean of the Faculty of Innovation and Technological Business at the Academy of National Economy under the Government of the Russian Federation.

What are the latest changes in world politics in terms of innovation?

The mechanism for innovation is exactly the same worldwide. The “rigid” infrastructure comprises buildings, physical structures, research parks, technology incubators, institutions; the “soft” infrastructure includes regulatory preferences, the system of private-public partnership and the like. We have embarked on this course, and I am excited about the Kremlin for the first time in the recent fifteen years. What is going on under our eyes is a kind of revolution. In my opinion it’s a miracle. Even more so wonderful is that it

these things work together is not very high. To make this happen one needs either a competitive environment or administrative measures to encourage it. The manufacturing industry is reluctant to innovate in any country. That is, it is not a typically Russian problem. The state establishes a certain system and calls it innovative to sustain high rates of economic growth. It is exactly such a system which increases the probability of these trends coming together.

What are the ways to stimulate innovation and their key points?

The key point is that state support of the risky part, mostly connected with the prototype stage and the pilot run. At this stage the production sector is not yet ready to purchase, but financial needs are substantial. It is not science in its pure form anymore. That is why the state employs various support systems. Such support systems are rapidly evolving. Every country demonstrates some good examples. For instance, last year firms received the opportunity to include R&D costs adjusted by 1.5 into the production price, which seemed absolutely unbelievable 3 years ago. Such practices already existed in the world as exceptions, and now we have this in Russia. It is a very good example. Earlier R&D costs could be only covered by profit. What does it mean? If you need to spend, for instance, 100 units, you should take these 100 units from the current year’s profit, which is subject to taxes. And this profit should also be correlated with the profit for the prior period. Of course, this practice was detrimental to innovation. Why did the state do this? To prevent various corrupt practices.

What kind of corrupt practices?

There is the practice of writing off costs, as if they are R&D costs, which are not really so. But now we have a system of expert judgments to define what can be written off as R&D expenses.

This is an effective leverage to stimulate companies to spend money for research and development. Innovations are always connected with the development of a new technology, a new product, and this process requires R&D costs.

Now the money spent for R&D is included into the production price. At that, the expenses incurred are adjusted by 1.5. That is, if you have spent 100 units you can make a 150 unit write-off against the production cost. Can you imagine that? Ten years ago I saw how it worked globally and thought it was a very bright idea. Putin announced the same policy last year.

What are the characteristics of the Russian innovation system? What are its strengths and weaknesses?

All the weaknesses are of mental origin. We are unable to sell technologies. More than that, we consider selling technologies as betraying the motherland. It is a survival of the times past. We believe we should do everything all by ourselves. If we do not operate on an independent basis then our security is questionable. This belief

is deeply rooted in public mentality and in the heads of our public leaders. It is deep down in our minds and souls. In fact, there is hardly anything that we can produce in large numbers for the international market. It is caused by our severe climate, high prices and transportation costs. We can earn far more by transportation schemes and selling of innovative technologies. I mean technologies that are

A successful business is a business fully functional on the international market and involving foreign partners.

And it is rather complicated to subvert such a business. It is not like the case when someone is entitled to develop a certain oil deposit and then stripped of it. It is completely different. A business of this kind frequently changes hands. It should be extremely transparent to attract foreign investment.

happens in Russia, because I simply have no idea what else one can do here.

The fusion of innovative research and technology, inventions and scientific solutions with business needs and the potential to thrive on their coming together existed long ago and will always be there. The chance to make all

developed to the prototype stage and certified. As for mass production, many countries transfer it to Southeast Asia.

At the moment a very good idea for venture capital funding is being promoted by the state. It is a miracle. The institution for development is the Russian Venture Company. The state is investing into this company 49% of its capital, and business invests 51%. At that, the state guarantees that it will have no claims to the profit made by the fund. It means 49% of risks are mitigated by the state. The entity which has invested 51% of the capital is entitled to 100% of the profit. It is awesome! In investing the money the state creates the infrastructure for business to raise money. In this case all the risks are justified. Business will find venture funds on its own, when the state gives it an example. According to the new law, adopted by the state, venture capital funds do not necessarily have to form legal entities. This is an investment

into the production sector. How can we accomplish that?

The state has already announced such a project. Moreover, it gave 30 billions to the Russian Venture Company, and adopted the law, but the public is still anxious about it. Will it happen or not? First of all, it is necessary to make positive examples widely known.

And what about fighting corruption?

You see, innovations are hardly ever connected with corruption. If you need to pay all those “kickbacks”, you can hardly expect any results from innovation. Innovations are too risky to add any corruption component into them. When a new business model is in the process of development, no one knows the final result. When you have a road construction contract you know for sure how much you will have to spend on it and how big a kickback can be. And here you have just a prototype technology, which should

money into our venture yet, but it has introduced a lot of technology into our business. We are still learning how to operate this kind of business. And is there any corruption? I doubt it. There is less corruption in innovation than anywhere else.

What is your opinion of research and technology parks in general and of the project Skolkovo in particular?

Skolkovo is an unprecedented project. I have nothing to say yet. I have been a member of the Board of Directors of the technology park “Idea” in Kazan for 9 years already. In my opinion, it is the best techno-park in Russia. It provides an excellent infrastructure for the innovative development of the Republic of Tatarstan. It is great that we have a single place where so many issues can be solved: how to help gifted children find their way in life, where an inventor can find investment and administrative support, where a growing business can find a supportive environment, where a big research-and-technology business can locate in a convenient location, where a large firm can resolve its technological problems with the help of a regional infrastructure. Here we have everything we need. That's why it is one story. Skolkovo is a brand new, powerful and globally unknown element. It will surely not become the second Silicon Valley. There is no chance to build another Silicon Valley anywhere. None of the attempts to create one in America, Ireland or Finland have been successful. Silicon Valley is unique. And Skolkovo will be unique too.

You see, the problem is that there is a kind of a receiver of scientific and engineering achievements in a specific area of expertise. Scientific and technological achievements are in great demand in rapidly evolving industry sectors. We call them innovative industry sectors. They are somehow interconnected; they have a kind of a pipeline between them. And if one of the pipes is transferred to Skolkovo by means of the state budget or some other administrative resource, I am not confident that this scientific and technology receiver will involve Russian institutions. Some development teams will definitely be there. But in my opinion, the industry sector that incorporates all these technologies will not be located on Russian territory. But some Russian participants will definitely be present in this industry sector.

Is Russian industry ready to manufacture products using the results of scientific research carried out in Skolkovo and other techno-parks? Is the production sector able to manage this?

Your question reveals that

Solkovo is a brand new, powerful and globally unknown element. It will surely not become the second Silicon Valley. There is no chance to build another Silicon Valley anywhere. None of the attempts to create one in America, Ireland or Finland have been successful. Silicon Valley is unique. And Skolkovo will be unique too.

fund, into which shareholders place money. And if the fund is a legal entity it has to pay income taxes and pay shareholders' dividends, which are also tax-deductible. This double taxation destroyed the very idea of innovation development. But the state has adopted new laws. Thus we witness these amazing events happening in the Russian economy.

What are the characteristics of the Russian innovation system?

I think that the Russian innovation system is quite complete; we just do not have enough people who believe that when it has evolved their business will not be taken away from them, who believe they are able to succeed and that the system offered by the state is not totally bureaucratized. In general, the state is the ultimate rescuer to which anyone dashes for help. However, there is no obeisance towards and respect for the state in the society.

People should have belief in the state to make more investments

be finalized. That is why an innovation economy is less corrupt, because it is hard to predict the final outcome.

The main deterrent of innovation development is people's anxiety that they can be stripped of their successful and established business. How can we manage this?

This is a very good question. You see, we are not mature enough for this. A successful business is a business fully functional on the international market and involving foreign partners. And it is rather complicated to subvert such a business. It is not like the case when someone is entitled to develop a certain oil deposit and then stripped of it. It is completely different. A business of this kind frequently changes hands. It should be extremely transparent to attract foreign investment. I need to say I am not only the dean of the department; I am also the head of a venture capital fund. So, one of our partners is an Israeli venture capital fund. To be precise, it has not placed any

problem of mental origin that I've mentioned. Who has told you that our innovations should be used in Russian industry only? It is not necessarily so. Innovative industry is oriented to the global market in 99 cases out of 100. The reason is that if you invest one million of risk capital, you need to have a market capacity of not less than one hundred million. In many cases the market size of Russia does not allow it. But there are some exceptions, for instance the 1C project. Currently I am also leading the project, which is purely Russian but very ambitious. However, these are exceptions. As a rule, when people invest into development of a product with a global competitive ability, the product is intended for the global market. And it will be produced where it is cheaper. That is why we should speak about our products and our manufacturing industry from the innovation viewpoint. And the Kremlin is using an administrative tool to stimulate this. This is absolutely correct, because they are interested to trade for economic reasons. However, even in Soviet times we sold very little of our engineering products.

Then, why has the state politics turned to innovation?

There are people with a strategic way of thinking in the government. The state realizes that its good to export hydrocarbons, but it can not last forever. On the other hand, lots of enterprises are literally dying out from not knowing what path to take. There are many people who need a goal in life. They are currently engaged in the Skolkovo project and it is going to be a great example. Another innovative project – "Seliger" – is the best initiative of the Kremlin in the innovation area. The involvement of the young generation is the key success factor for innovation.

Once we have touched the topic of young people, it is worth mentioning that universities all around the world offer special courses and programmes that teach students how to set up a business, make a business-plan, etc. Young people are trained to become businessmen. Do we have anything similar in Russia?

At our department we have students with higher education. They come to us to learn how solve new challenging tasks; they want to become more valuable on the labour market. We usually tell them; "If you come with a definite purpose, you will graduate with the expertise required. If you do not have the objective of your own, then we shall identify it for you. But you can not learn anything in theory, without any specific, relevant and significant objective". That is why our aim is to teach people how to resolve new challenges. Generally

these challenges are innovative. We teach how to create new products and to introduce them to the market. We are doing this on the regular basis since 1995. Our department is a unique educational structure. No other university in Russia specializes in the same knowledge area for so many years. No other educational establishment in Russia has the same staffing and methodological capacities as we do.

On September 22nd-25th, 2010, the II International Youth Innovation Forum "Interra 2010" will take place in Novosibirsk.

To this day the Forum is one of the biggest behind the Urals ground for interaction of administration and business representatives and expert community on elaborating solutions and introducing new innovative practices into economy, administration and social sphere.

www.interra-forum.ru

Russian Corporation of Nanotechnologies, RUSNANO, and the Russian Academy of Sciences (RAS) have jointly established Center for Technology Transfer (CTT). The project is implemented under a cooperation agreement between RUSNANO and RAS. The mission of the Centre is to commercialize knowledge and technology developed by the research institutes of RAS. Projects developed in the Center can apply for RUSNANO's co-financing, as well as to seed and venture capital funds.

www.rusnano.com

The Swedish-Russian Conference on Business Solutions covering practical aspects of preparing for and conducting business in Russia will take place Stockholm September 15. Russia is currently Sweden's thirteenth largest market for exports and fourth largest market for imports. We see an increasing number of Swedish companies operating in Russia and the interest in new business opportunities in the East is growing. International cooperation is sometimes complicated, with different laws, rules and business practices, and at times it can be difficult to understand. That is why it is important for those who are venturing into the Russian market to stay informed about matters within the field and take the right first steps.

www.barentsnova.com

Nanotechnology International Prize has been established by Russian Corporation of Nanotechnologies (RUSNANO). Starting from 2009 it is awarded on a yearly basis to researchers whose nanotechnology discoveries and innovations have been applied to production as well as to companies that practically implemented them. The Prize is awarded in one of the following fields: Nano-Electronics, NanoMaterials, NanoBiotechnology and NanoDiagnostics. Each year the field of the Prize is being defined and announced before the nomination circle.

In 2010 the Prize will be awarded in the field of "NanoDiagnostics". The Prize monetary part will make 3.000.000 roubles (approximately 100.000 USD).

www.rusnanoprize.ru

Innovation Chain: Searching for a Missing Link of Russian Innovation System



Dr. Sven-Thore Holm – Head of Division Industrial Pollution Control, Unit Governors office, Malmö, Scania State (1972 – 1982), CEO of SUN-Foundation, Responsible for the planning of Ideon, the first Science Park in Scandinavia (1982 – 1985), CEO Ideon Center AB (1985 – 1994), CEO Foundation for Technology Transfer in Lund (1994 – 2007), CEO Teknopol AB (1994 – 2000), CEO Innovation Bridge South AB(2005 – 2008).

What are the peculiarities of innovation system in Sweden?

Sweden is a small country. We are only 9 million, but amazingly we have a large number of multinational companies. You know the Volvo, the Ericson etc.

But Volvo is Chinese now?

Yes, but still, it has been developed here. The Chinese – they are buying technologies, and we are developing technologies. That's the difference.

So, as a small country, the total economy is based on R&D (Research and Development) oriented companies. This has been going on for fifty-sixty years at least. We have a strong military industry; we are producing pharmacy, automobiles, telephones and entire telephone systems etc. So, as a country, Sweden has always been based on high technology and, in fact, also on interest of the government to support that such of things. And, of course, this had implications to our universities, our institutes, and we are producing educated people, which is a long term political issue, so to speak.

We started changing the structure of the economy in the eighties, when the old traditional industries started to fall down, and textile industry was more or less exported to other countries. Then the government decided to get some value out of national investment in research and development, especially in connection with our universities, which is to 100% or to a large extent, I would say, paid by government money, but also to a large extent by private money. We are spending about 4.2% of our GNP on research and development, which makes us the leader of world. Most countries, to my knowledge, spend around 2%.

In the eighties there were some discussions about how we can even be better? And I was in that time in charge of environmental control in Southern Sweden. At that time we started to clean up our industry. And by having some connection with industry, I got some knowledge about what could be done. Supported by the governor of Southern Sweden I was then appointed to start the first Science Park in Scandinavia. And if you ask me how to create a national innovation, I will say that it starts with the people.

Now we were heading for the next generation of the industry. And this generation should be based on science and development. That is why we started to establish a kind of Science Parks System. We should extract people from universities and institutes to establish their own companies based on their own research, and support it heavily by public funding.

So, basically, it was the government that decided to invest money in innovations, the government launched the process?

That is what Russian government has decided recently. Recently they have discovered that this is a matter for the government, because the private sector will never invest in early business activity. It is too risky.

In order to foster the innovation system the government should realize that a total, full-stage innovation system is a vital part of a modern infrastructure. If you don't have this innovation system, then, probably, you are lost, because the competition in the world is so high.

If you invest heavily in research and development, then you get hundreds of institutes and universities. And what will come out? What kind of Russian product can I buy in the future? So far, I don't own one single Russian product. You cannot buy any Russian products outside Russia except for oil, metal and wood. So I think it is a good idea by the government now to try to change Russian economic structure, to create an economy based on production of commodities, an economy more based on R&D, your own R&D investments. You get tens of thousands of researchers doing what and for whom? And that is an essential thing of a true innovation system – to get all these people motivated and put them in a system where knowledge, and Russian knowledge is worldwide very well known, would have access to a commercial market. This is a true meaning of innovation system.

What innovation system starts with?

We start training young people, 4th grade – 5th grade, in creative thinking. Because in the future you need these people to do their work. And when I got to college, we had some national competition on how to create a small company? And on university level we have a national education on entrepreneurship, and students are taught how to create a business plan. And I am a chairman of Venture Cap Sweden which yearly involves thousand of faculty members and students to create a business plan about this sophisticated idea.

What should be done in order to improve the innovation policy? You are saying first thing is education.

The innovation policy starts with encouraging the people. Without people you are lost. You can get all technology in the world, but if you do not have a person behind it – what is going to happen? - Nothing.

It is very important, the thing that you've mentioned education system. Could you continue, and say what other step should be taken in order to encourage innovations?

Now you need to know the difference between invention and innovation. Invention is a kind of scientific discovery.

Inventions can be turned into innovations. Therefore, innovation is a commercialized invention. And in a political society this is mixed up, because politicians think that scientific inventions are innovations. But they are not. Inventions have no value. Innovations have value. And in order to turn invention to innovation you need to have an innovation chain which consists of different links. And if a chain has a missing link, how do you think it will work? It will not – forget it.

What this chain consists of?

The first link is governmental – national, regional, local – initiatives with a full understanding of what an innovation system consists of. The politician must know. And the second link is the people and universities. Knowing what an innovation system consists of, the government will need to have invention, discovery of commercial value. The government will need to train university and institutional people how to evaluate what they are doing – that is a special course. We have a special system – a good quality proof of concept. It means that scientists are proving that a scientific value is OK, and that there is, probably, a market for a product, and that there is, probably, a group of people who is bringing this to the market. That is what we call a proof of concept. If the answers to this question is no - technology is bad, no market and there are nobody to take care of this in the future – drop it. If you get – yes, yes, yes – then bring it to the next level of the innovation process.

So, the first link is government?

Yes, the government trough the national budget gives the money for everything I am talking about. If not, nobody else is going to do that. Because they are looking for a profit in a short run. And this is a long shot. Business will come on later, when most of the risks are gone and proof of concept is OK. Not before.

How long will it take business to start investing money in innovations?

It is a matter of a couple of years. Our experience is that if you are developing a software company, then twelve months. If you are developing hardware – then 3-5 years. If you are talking about pharmacy – you are talking about 7-10 years. There is no quick fix.

What can you say about innovation systems of the countries you are familiar with?

Innovation policy is on the highest agenda in most Western countries, like Britain, Denmark, Germany, Finland, Sweden, and, of course the US, also Japan in the East, but they have some problems, and China. China is, more or less, fed up with copying technology. Now they would like to

develop their own people, knowledge and products. And they are very eager to do that. They are investing heavily in innovations. They started a couple of years ago. The political society on the central level in Beijing has decided that innovation system and environmental control are the main things to China, and put these ideas down in the provinces. And they are having success.

The fact that China is not a democratic country with a market economy, what implications it has for the development of innovation system?

Innovation system is not initially driven by market economy. Partly, but not entirely. If you like to have you own researchers to deliver, and they have no connection to the global company, you will have to make a system where you discover what they are doing, import what they are doing, organize the structure and get it out in the world.

As for political system itself, of course, you cannot order people be innovative. You can order people to do a lot of things, but not be innovative. Because innovation comes from a free mind. And a free mind will deliver to society an amazing result.

And in China these free minds, they do exist?

Today China is importing people. Chinese American people from MIT (Massachusetts Institute of Technology), from Stanford, from amazing universities in the United States – these people are moving back. With American mind, with Chinese money they will be successful. And even in present Chinese population there are people that are interested in innovations.

Why do you think these people decide to move back to China?

They have all the money they need to establish research institutions. And in the bottom, they are Chinese, and not Americans.

Making a parallel to Russia and its history, when in the 1990-es seventy thousand people with higher education, scientists moved away, mostly to Israel and the US, do you think some of these people may come back to Russia?

It is amazing what Russian people do in Israel. To my mind, they are a backbone of the Israeli innovation economy. They were trained in Russia, and they deliver in Israel.

They will move back if you get the innovation chain working, if they get financial support. I would say, that is the main question of the center government of Russia – how would you do that?

To your mind, it takes only money to attract these scientists?

Let's take for example Skolkovo,

which is an amazing project, where people will have everything they need. And money will attract some people. But I think that people are attracted not only by living, but also by culture. Culture, that you have a lot in Moscow, in Russia in general. It is not always a matter of only money. It is a matter of money, and research labs, culture, living, etc. There are a lot of things that should be taken into account if you want to attract people from abroad and get things going. And there should be some kind of relocation activity because if you go as a man and woman attracted by some research activity, you need to find a job for your partner. You need an infrastructure.

I got a lot of information about Skolkovo, I have seen a lot of foreign companies that are interested in this project, but I have not read too much about how do Russian government attract Russian scientists to live and work here? What kind of activity they are going to do in order to create brand new Russian companies?

What are potential strengths and weaknesses to Skolkovo project?

I think that it is a very good initiative. It is a shift in Russian policy in terms of economic policy. It is a shift from resource based economy to innovation based one. There are planning to make heavy investments in innovations. But I would like see more examples when Russian scientists are given opportunity to create new Russian products that will enter a global word market.

In what way are you involved in the Skolkovo project?

I got an invitation to Skolkovo, and I said I am only interested in helping with the development of Russia's national innovation system - Russian people, Russian financial sources, and Russian companies. I am not interested in importing foreign companies to Russia. This can be done by anybody. But to encourage Russian people, and Russian academy, Russian financial system to create an internal national system – this is I would like to do. But I have not got an answer yet.

Innovation System: the Problem is to Get the Process Started



Jan Kregel – Professor of Finance and Development at Tallinn University of Technology, Tallinn, Estonia. He is also a permanent advisor for the Trade and Development Report of UNCTAD, as well as an Adjunct Professor at Johns Hopkins SAIS (SAIS), and a Visiting Professor at the University of Missouri–Kansas City.

Professor Kregel, to your mind, what are the latest changes to innovation policy in the world? What do think about the given changes?

If you look, basically, what we've seen is a very large shift in what we would call the innovation paradigm, the general approach to innovation. So, if you can divide into very broad categories, and say that we shifted from a mass production paradigm, the one that is based primarily on capitalist production and economy of scale, to one that has moved into more specific production and what we call the idea of economy of scope. In general, this is blink to micro processors, and the use of computer technology, communications and the things of this sort.

The first, I think, important change that has brought this shift in innovation paradigm was a simple possibility of a geographical dispersion of production. It means that you can access lower costs in specific markets. If you had a particular type of production, say, for example, you are producing an automobile, you produce an engine in Indonesia because the wage costs in Indonesia are much lower than they would have been producing in a European country.

So you have dual impact. The idea of using computer technology and micro processing had an impact on the production process, and also you have this impact on other costs of production, and, in particular, labor costs that you can generate by moving the particular parts of the production process to different countries. And this you clearly never would have done with the old fashion. By old fashion I mean the first process we talked about, which was mass production because all of this, by definition, had to

take place in one particular place, in a very large producing unit. I think this is the most recent change.

Now, obviously, we've seen over the last 10 or 15 years a big process of globalization which has been basically driven by a kind of technological innovations. The question is what is the next innovation wave? A number of people have looked at things like nanotechnology and biotechnology. But there is another side area which is environmental. So, if you look we have a big oil spill that is taking place in the Gulf of Mexico, and the kinds of technology that you can see that has been used there are in fact a sort of that mass production technology still. So, in terms of energy production what I think we going to see is a large amount of accusation of things like biotechnology.

What do you think about changes to governments' innovation policy? Are there any changes in what governments do about it?

If you look at the US government – US government has always had a very strong technology policy, and this has always been the national defense. If you look at some of the innovations that we've talked about – the micro processors, micro technology, things like the Internet, the Internet was originally generated by the US defense department in order to ensure safe and secure method of communication in case of national emergency or national disaster. This was something that was clearly generated as a part of research and development that was initiated by the government through the defense department. Much of this currently has changed. Let's take the example of Internet. When the Internet was developed it was not thought about as a commercial process, and the government really took no steps to ensure that it could be used as something that could provide a commercial basis. The only thing they were interested in is whether or not the militaries and the government could communicate among each other. They never thought that the Internet would be something that you and I would use in terms of daily activity, or that it would be a commercial process. So this was something that was developed more or less spontaneously by the market.

Currently, the government has support for research and development which is undertaken in a more balanced way. That is what would happen is that they would put out a tender or if you like call a contest for a particular product which they would like to develop. And then the individual companies would compete, will offer different solutions to that contest. But when the government finds the one that they decide is the most efficient it then also attempts to provide the company with a possibility for a company of using it for commercial purposes. That is to build it as a viable commercial entity.

Now, in one way, the government is providing this because once a company wins a contest, obviously, the government is going to buy its product. So, it provides it with a market. But, at the same time, it also gives to the company supports in terms of trying to develop a commercial market for that product. Say, for example, the defense department asks for some piece of equipment that is supposed to be used only on some sort of secret airplane. Obviously, the company can't sell that product to the market because nobody else could use it. So what they do is to help the company elaborate the product so that it could be used in some way that it could be sold in the commercial market.

Instead of just supporting research and development of a product they also support the ability of the inventor of a product to form a company. So, again, let's just take an example – Microsoft. Say, Microsoft had developed

its operating software just for the government. The government then would buy your software but at the same time will help you to form a company so that you can sell your software to the general public.

What about the market environment in general? I mean, another role that government plays is that it creates an environment where new companies, so-called start – ups, can easily operate. To your mind, what a government is to do in order to create an innovation - friendly environment?

Well, as I have already mentioned, first thing is in providing market for products. It is very important. The second thing which has been very useful, in particular in the US, is industrial parks. What we call cluster into a particular area. Now, this is a very long tradition that talks about industrial district or industrial zones. And the fact that you create very large externalities by allowing firms

things like that.

Another very important thing is coordination of financing, and what we call a permission of venture capital. There is something the government can't support by means of setting up ventures. For example, in the US we have government sets up its own venture capital funds. It provides financing for new innovation and new technologies that they are particularly interested in.

You have to do all these three components: you have to have a possibility to create new companies and implement and sell products on the commercial basis; research and development in the industrial parks and innovation centers in order to produce the technology; and you also have to have financing or venture capital financing.

One of the difficulties is simply getting all this process started. Most of the new start – ups are in fact financed by already existing companies. So, if you take a big company, like Intel or

can use. So, you get this process of inner venture capital funds which are set up. And many times this is what we call vendor financing.

For example, Cisco produces routers. Now, there is maybe a company producing a completely different product but requires the output one of the routers that Cisco produces. So Cisco will sell them the product that they can use in innovation process but they won't charge them for it. That is they will not make them pay. They will say: "OK, we will lend you the money to buy our equipment, so that you could develop a new product. And then, if you are successful, you can always pay us back in terms of shares in your company or in terms of profitability". So this process of internal financing within a sector which comes as innovation process becomes mature. But, as I said, this is something that comes as a secondary stage. The problem is always to get it started.

Do governments always understand their role in innovation process? What government innovation policies are you familiar with?

In general, the governments don't pay enough attention to innovation policy. In general, as I've already mentioned in the US it is primarily a defense – driven process. And the idea is basically that the private market should be capable of doing this by itself.

You do have very strong policies. For example, the Chinese government has a very strong policy in terms of using foreign direct investments, and joint ventures in terms of generating technology.

The Japanese government in difference had a policy of buying technology from the outside and then developing it internally. This is a different sort of process, the one that comes from a country which is in process of catching-up. After the war Japan was in a position in which industry was totally destroyed. So they had to start from scratch. What they did is that they went and bought technologies primarily from Europe and from the US. And then they set up a process of internal elaboration of those technologies.

So, basically, the difference in terms of governmental policies, say, between Japan, China and the US is that the US already being an advanced country faced a very different innovation problem than was faced by Japanese government. Korean government had a very

The governments do not pay enough attention to innovation policy. In general, as I've already mentioned in the US it is primarily a defense – driven process. And the idea is basically that the private market should be capable of doing this by itself.

that are working in a particular area be concentrated so that there is a dissemination of information and other stuff.

You always have to keep in mind that there is a very strong linkage between the innovation side that is part of research and development process and the idea of implementation and commercialization. And if you can't manage to generate a demand for the product and efficient sales for the product then the entire process brakes down. It is impossible to have just research and development just for the sake of innovation. You have to be able to implement and install the technology, and for this you are required a strong support of commercial sector. This is one of the reasons why, for example, defense department pays much more attention to the formation of successful commercial ventures supporting the research that they are interested in. And this is also something that you find by setting what you call industrial districts or innovation centers or

Sysco, Intel and Sysco have their own venture capital fund. They simply finance new companies, and try to develop new products. Once the process gets started, it is much easier to proceed. The problem is to get this process started, and it is when the government plays a very important role in providing both the possibility of creating the industrial parks and providing the kinds of venture capital funds.

So, at some point innovation system becomes self-sufficient. In other words, it reproduces itself. But still, we cannot do without government in order to create a well functioning innovation system?

That's right. The idea is to get the whole process to get started. Once it gets started, then you get this sort of self generated production. In general, we see in the US this sort of large and successful companies. You start up with a particular kind of innovation, and the companies that are interested in finding other innovations which they

similar proposition. That is, Korean government bought technologies and then developed them internally.

This is, more or less, a decision of a country whether you are supporting what is called basic research or whether you are simply taking existing technology, trying to elaborate those technologies so that you build up domestic competent.

And one of the difficulties here is that, if you are already in advanced country, obviously, you have trained personnel that are able to work in this sector. Whereas, if you are in a country which is catching up, you need your own human capital base in order to provide a possibility for setting up your own technological development.

Some countries succeed more in innovation, some less. Why some governments manage to build more efficient innovation systems comparing to other countries?

Basically, I think important aspect we found is whether or not the government policy very strong supports domestic expansion and domestic employment. Because the more successful the economy is, if growing and using its domestic resources, generally, we find the more successful it is in providing innovation. Countries that have very low growth rates and have high level of unemployment then, in general, they do not have the resources to devote to innovation strategies. On the other hand, the economies that are attempting using policies to grow very rapidly and to provide full utilization of the resources are the ones that do in fact end up with successful policies. I think it is a question that cannot be separated from overall approach to economic policy. Economies that have been successful in innovation have also been the economies that have been successful in their industrial development and using economic policy type to produce reasonably high growth rates and reasonably high levels of employment.

What research and development may assure technological breakthrough in the nearest future? Do you think that such a breakthrough will happen?

As I have already mentioned, a lot of people believe that nanotechnology, the idea of this little micro engines is going to be the next level. So, if you look at these sorts of innovations, and you ask what areas it is going to be, I would say, nanotechnologies will serve, for example, in area of health service. They have not yet been export,

but they could be extremely important. That is, for example, in development of medication which, in fact, can be used for targeting implementation. So, instead of taking a pill which goes into your body and goes all over your body in order to produce a very precise impact in only one section, you now can take a little nano – whatever it is – and you ingest it, and it goes directly to the place where the medicine has to be delivered.

So, things like this, that are not being developed, have a possibility of changing quite dramatically the way we look at things like healthcare. Again, you have to separate the innovation from the implementation. A lots of innovation that come along are very interesting but may be they do, maybe they do not end up providing any sort of implementation that can be commercialized. In this case, let's say, if you look at nanotechnology and biotechnology – they set pretty clear impacts on sectors which are crucially important, like healthcare. For example, in the US our healthcare costs are extremely high, and they do create difficulties in terms of overall economic development of the system. So, if you manage to produce an innovation which can be used in order to bring down healthcare costs dramatically, then this sets a very big impact on the economy not so much as a result of the innovation but as a result of the way the innovation is implemented in the system.

INNONEWS

Dmitry Medvedev confirmed the composition of Scientific Advisory Board of a nonprofit organization "Foundation for the Development of the Center of Development and Commercialization of High Technologies".

The Board includes well-known Russian and foreign scientists.

Zhores I. Alferov – Vice-President of the Russian Academy of Science (Co-Chairman of the Board)

Roger Kornberg – Professor at Stanford University, USA (Co-Chairman of the Board)

Vladimir B. Betelin – Director of the Institute of System Research, Russian Academy of Science

Evgeny P. Velikhov - President of the Kurchatov Institute

Yuri V. Gulliaev - Director of the Institute of Radio-engineering and Electronics, Russian Academy of Science

Eugene V. Kaspersky – Founder of Kaspersky Lab

Vladimir V. Kozlov - Vice-President of the Russian Academy of Science

Gennady J. Krasnikov – Chief Executive Officer of Scientific Research Institute of Molecular Electronics and Plant «Micron»

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August 24 2010

«New growth strategy» of Japan: Goals and Objectives



Dr. Hiroshi Komiyama – the president of University of Tokyo from April 2005 to March 2009. His major research fields are Chemical engineering, Environmental engineering, functional material science and CVD reaction engineering. Dr. Komiyama is member of the World Knowledge Dialogue Scientific Board.

What are the peculiarities of the innovation system in Japan? Where did they come from?

The general idea of innovation is a technical improvement in Japan. Because it is thought that the technical excellence is the reason for a high industrial competitiveness of Japan. Therefore we think that the breakthrough in the next age is invented by high technology.

What are the latest changes to innovation policy in Japan? What do think about the given changes?

The Japanese government decided to take «New growth strategy» on June 18. A new growth strategy specifies two innovation strategies for the field that is able to grow up by making the best use of the strong points of our country, that is to say high technologies, which are nanotechnology, ma-

terials science, micro engineering, are strong points of Japan. One is an environment energetic strategy by the green innovation. The photovoltaic generation and the fuel cell, etc. are typical examples.

Another one is the healthcare strategy by life innovation. Healthy long life may reduce healthcare costs, but what I mean by life innovation is not only that. Participating in social activities can maintain senior citizens healthy in their mentality, so that the technological innovation for this matter is very significant.

As the target until 2020, 'Creation of new market of 50 trillion yen in the field of environment', 'New employment in the environmental arena of 1.4 million people', 'Green house gas mitigation of 1.3 billion tons or more in the world utilizing the technology of a private sectors in Japan' and 'New market about 50 trillion yen and 2.84 million people of new employment corresponds to the demand for service related to the medical treatment, nursing, and health.

However, a concrete implementation plan for achievement of the strategies is being discussed by the government.

What are the latest technological developments or breakthroughs in your area? How did Mitsubishi Research Institute contribute to this development?

Mitsubishi Research Institute is doing a policy research on the green engineering, the energy technology, and the material and the nanotechnology technology, etc. and the research on the technology strategy. We contribute to the policy decision on the government and the enterprise as a think-tank in Japan. Mitsubishi Research Institute is doing making and a technological assessment of the technology and technological road map for the government.

To your mind, what researches and developments may assure a technological breakthrough in the

nearest future? Do you think that such a breakthrough will happen?

There are three problems; a social load of the global warming issue, the aged society and domestic demand shortages in Japan. Among them, the aging of the population and the shortfall in demand are the most serious problems. They are fetters of the recovery of Japanese economy.

If these three difficult problems are solved in advance of the world, and it is possible to present it as a social model, Japan becomes a problem solution advanced country. Mitsubishi Research Institute is now advocating «Platinum society plan» under this recognition.

«I Think E-Mail is Dead»



**Carlos Dominguez – Senior Vice President,
US Service Providers Sales at Cisco Systems,
Inc.**

To your mind, what are the peculiarities of the US innovation system?

The US has a very long history and Silicon Valley is a really good example of what I would refer to as innovation system. So, innovation system includes universities that are bringing the right people, and they also have in the universities think tanks where people gather trying to solve some problems and great ideas. Almost every innovative technology has come from a university. As a matter of fact, Cisco was born of a project in Stanford University. So what is happening is that if you have an idea, venture capital will provide some money to you and guide. The laws are favorable in some states. They really promote incubation and entrepreneurship and a variety of other things. It is a model that really works. It is a combination of having a government that supports innovation. Secondly, having the academy and the bright people that can do it, having venture capital community and money to be able to do these things. And last, but not least, some our private and public partnerships that occur are driving along these things.

I think that is a kind of system that work, particularly, around innovation in the US. It is a model that you try to replicate over and over again. Skolkovo or Innograd is going to be a model that they try to replicate some of the things that are happening in the US Silicon Valley.

Do you think anything might be done to stimulate innovation? Or maybe the system is perfect as it is?

It is never perfect. There is always room for improvement. I think the system had worked here very well. But you always can do better. I will give you one example, and it is very US centered. Math and science are some of the core technologies to develop engineers. I would love to see at the governmental level more empathizes done into education to really promote and improve math and science. That is probably a common problem around the world. Government can also help with incubation and creating entrepreneurial incentive. GDP of a country is based on small and medium business, but not on big companies like Cisco. What you need is to have a lots of small businesses. But they need to know how to run a business innovations because without innovations they can never start a business.

And government can play a role in a lot of those areas by tax breaks to help small business, by giving incentive etc. All of those things can be done better. At the academic level, in universities I think there can be done a lot more too in preparing people. Approach to education should be revised. Games as a function of learning is one of the futures of education. Why should learning be boring? There is a large movement leveraging game theory from learning. And when you combine all these things and when you have that environment where you have government companies, venture capital, entrepreneurs, – that is a field for innovation. What we are trying to do differently – we are trying to build an innovation platform and I mean by that a process of innovation requires technology.

Speaking about other countries, what can you say about their experience?

One thing that is very important, especially in the context of what is happening in Russia, is that it is crucial for a government to understand, there is a very tight correlation between Internet and IT and the impact that you have on GDP growth. Countries that have figured that out are actually driving laws to promote deployment of Internet as making it universally available. Those are the countries that are going, I believe, lay the foundations for leveraging the technologies. For example, Finland in June 2009 passed a law that Internet is a human right for all their citizens. Another example. China is very focused on information technologies, education, and entrepreneurship. Funding is not a problem there. India has done some incredible things also. Korea is building a city – a smart connected city. Everything is going to be connected – transportation, education, healthcare.

Singapore, in Middle East Abu-Dhabi are doing great work. The common idea in all these countries is the acknowledgement of the role of Internet. The acceptance of that they have to build infrastructure of IT and knowledge for their people is very important.

What do you think about Skolkovo? I know that CISCO is very much involved in it. What initiatives will be taken?

For us it is very exciting to get to work with your government and your private industry. I think they got it right in the sense that they want to build innovation as a part of the industry of

Russia. You have got a fertile country. There is a lot of knowledge in the country. So you need to figure out how you are going to leverage it? Another smart thing is that I think they are not trying to reinvent things that have already been invented. They are trying to do models of what has happened in Silicon Valley, and learn from it. I think our biggest contribution is intellectual capital and knowledge that Cisco has in innovating, but money will be invested as well. We have a lot of experience in what works and what does not work. Communicating this knowledge and people will be really beneficial.

We brake it into five phases . At the first phase we are deciding who is the team, how do you teach more networking technology, entrepreneurship, also we are investing money. As it progresses to

disappear. Think about a very large company not existing and when you analyze why a company exist only forty years, you understand two things: it is a combination of innovation, which is one of the key things, that we are doing in Russia and we really have a focus on, because innovation is what breaks you into new markets and changes the way the things are done. We have a lot of examples. For instance, TelePresence technology changes the way people get together and meet, the way we do business. This is an innovation that really is a breakthrough.

The second piece that keeps a company in a leading position is operational excellence. which means you take things that you invent and innovate and then build a process around, how to replicate it and how to put into other countries. So what

build the next generation company for the future which means that we are all empowered to change and to do the things we want to do. CISCO is much stronger if everyone thinks. So, I think, these are all the things for the culture perspective that make CISCO very unique and one of the reasons why I am very happy to be here and very proud to be a part of the company.

What is the ratio between external and internal innovations in CISCO?

I do not have the exact number, but we have a strategy that encompasses 3 things. One of them is that we innovate internally. We normally innovate around technologies that we know a lot about. For example, the birth of our company is around technology called routing. So we know how to do routing very well. I do not think that there are many companies out there that know routing better than Cisco.

The second area is that we are trying to enter new markets. For example, in the case of switching, when switching first came in the case of data center, or in the case of video , where we did this very well but there was another company Emberg, that had video high quality on to the PC that are smaller, cheaper units. In those cases, if we are not an expert in a technology, we will buy those companies. So, part of our innovation is also having a strategy of acquisitions. So we have a process of doing acquisitions.

And the third aspect is that we do not know all, we have not invented every single product or idea. So we seek to get input in knowledge from the world. We have programs like I-Prize . I-Prize is a contest where we have a prize of \$250000, leveraging social media to give us best ideas in these categories and people submit ideas. We have done it for 2 years now. The first year a team that consisted of two Russians and a German won a prize. We wanted to develop their technology. Innovation is a top priority for CISCO and for most companies. If you are not innovationary you are going to be left behind at some point of time. There is not one way to innovate: you can innovate internally, externally (with programs like IPRIZE)

Government can also help with incubation and creating entrepreneurial incentive. GDP of a country is based on small and medium business. What you need is have a lots of small and medium businesses that require knowledge how to run a business innovations.

phase three, four, five Cisco will start putting some key resources. And ultimately once Skolkovo innovation platform is done and we have talent there, I think it will be some incredible innovation and products that will come out of there. We see the opportunity and we hope that the next few years it continues to develop the way I hope it will.

With 133 billion market cap in 2010 CISCO remains one of the largest players in the field of consumer electronics, networking and communication technologies. My question is what keeps CISCO up?

In average, life spent of a company in a Fortune magazine is forty years. CISCO is twenty-five years old, so if we follow the average that means we have fifteen years left before we

has made CISCO in 25 years very successful and will make it successful in the future is the fact that we are very focused on innovations and we are also very focused on operational excellence.

Another thing that I would mention – is our culture. We have a great leader. I admire him personally and in business. I admire him personally because he is a really human being. He cares about people and he manages and leads this company with a lot of hearts. I will give you one very personal experience. My daughter was 25 when she had leukemia. She is doing very well. Do not worry, it is not a sad story, it is a happy story. My boss helped me through the whole process with her. I feel special that he did that with me, but he does that with many employees.

The second thing is that he wants to

or through acquisitions. We challenge things, we are always thinking of the future. All of these things really make CISCO unique.

New technologies and innovations help save your company money. For instance, this system of TelePresence helped to save around \$300 million per year. Can you name other examples when technologies increased efficiency and helped to save money?

I will tell you a quick story. Until five years ago I could not tell my kids what I do for a living because it was hard to explain. Because if you are doing products that are making Internet better and faster, you can only show them a box of lights, but they do not understand. So until five years ago when we got into consumers with Linksys and Flip, it was hard to show what we do. So technology itself means nothing to me. But I am proud of technologies that people use, that change the way that they live, work, learn or they way they play.

Technology like TelePresence changes the way I work. Some time ago in one year I did one million miles of flying. I was on the plane every single day. If you ask me what happened in your personal life I would not be able to tell you. I missed my children's birthday, I missed everything because I was on the road. And now, with this technology I may wake up at two a.m. and leave for the office to have a meeting with China, India or Europe, but I finish in one hour and go back to sleep. And now I have this technology at my house, and I do not even have to come to the office.

To your mind what are the greatest technological breakthrough in your area?

I think video is one. What we have done with personal communications is that we make it very easy to use. It is changing the way people communicate. We have technology that we are just announcing that really leverage the concept of social media and innovation gathering. I will make a prediction that might be controversial. I think e-mail is dead. Wherever 4 years from now or 40 but it is dead . I will

tell you why. Over 90% of the e-mails that I get are junk. I have got filters, but still I spend a lot of time trying to sort through that, and some of my e-mails I would be getting are filtered into spam. The way I communicate with my family by texting to them, or I communicate in a broader sense by leveraging social media, whether it is Facebook, Twitter or a variety of different things. The way I think things will be moving towards the future will be leveraging social media.

The power of U-Tube is very big. One of the things – the U-Tube is not private. We came up with a technology we called “Show and Share” which allows you to take a video clip and put it into a secure environment.

INNONEWS

The government is counting on foreign investors to help it privatize an estimated \$29bn in assets to reduce the state's “excessive” presence in the economy. Stakes in 11 state-run companies will be offered starting next year, and the sales will proceed even if state revenues outpace expectations, economics minister Elvira Nabiullina said during a budget meeting.

The timing and size of the sales – the largest since the controversial loans-for-shares privatizations in the mid-1990s – are yet to be settled. But foreign investors said they were encouraged by the focus on restructuring the economy and raising funds, rather than just unloading property.

“The privatizations should not just be a fiscal matter and not so much oriented toward raising funds for the budget, although that's also important,” Nabiullina said. “They are in large part a way for us to influence the structure of the economy.”

www.rbth.ru

GLONASS – a Russian analogue of American GPS technology – will be rolled out across the globe by the end of the year. Prime Minister Vladimir Putin made the announcement during a working trip to the Ryazan Region.

He also said around 1.5 billion rubles would be spent on developing GLONASS over the next 15 years. GLONASS currently covers the whole of Russia with the help of 18 satellites. By the end of 2010, six more satellites will be launched into orbit, which is enough to cover the entire globe.

The Russian government has already launched a program aimed at the practical application of GLONASS technology. Putin himself has proposed equipping all cars made in Russia with a system that will alert the emergency services, via GLONASS, of any accident.

www.rt.com

Russia submitted for registration its first carbon emission reduction project under a special United Nations procedure, a step that can signal “a substantial increase” of followers, a UN regulator said Tuesday. The joint implementation project, created under a UN Kyoto Protocol mechanism, will be located at the Shaturskaya thermal power plant near Moscow, the UN Framework Convention on Climate Change said in a statement from Bonn on Tuesday. The so-called JI projects generate tradable emission-reduction units that countries can use to meet their obligations to cut greenhouse gases under the UN climate protection treaty.

www.themoscowtimes.com

«We Are Going to Deliver This Report to Dmitry Medvedev»



Ellis Rubinstein - President and CEO of the New York Academy of Sciences

There are countries that have already developed successful innovation systems and those that are just starting developing theirs. What would be the best strategy for governments that plan to develop an effective, full-staged innovation system?

Newly developing economies and nations, particularly the BRIC nations and other that are trying to begin to compete, they do not have the luxury of waiting for “Silicon valleys” to develop on their own. That is obviously why we ourselves in New York Academy of Sciences provide advice in many settings including to your own President Medvedev. That is why we are building a report, and I will give you an official title, I call it “the race to innovate”. And our report is all about what you are asking.

The challenge for the developing countries is to figure out where is where, how the national government can be helpful in creating, what I would call, regional or urban innovation cluster or communities? The most successful strategy, in my view, as just if you were an investor deciding how to make best of your money, to try to create a portfolio of activities, so that you are not overly dependent on only one strategy. And this is really one of the biggest challenges that are facing leaders now in developing countries. They need to be able to figure out where is where. They will not simply duplicate what already exists and particularly try to compete with countries or cities that are already ahead of them. They will try novel approaches that will allow them to catch up.

One thing that sometime is advantage for developing countries is if they have real resources when they are starting from scratch and leapfrog a lot of old systems that are not helpful any more. So, for that reason, just one example. Many countries are talking about creating universities from scratch rather than trying to reform their universities. This is exiting but also a huge challenge. That would be my general remark about that.

One advantage that they have over developed countries

is that they may be able to leapfrog established behavior by doing things in a completely novel way. For example, creating entirely new universities from scratch rather than trying to reform their old system.

To put it in another way. Just like in the world of corporate competition, sometimes the powerful and large companies have disadvantage because they have so much embedded history and tradition that they cannot innovate easily. That is why small companies often can come out of nowhere as we have seen with companies like Google or RIM, to create a new structure, a new business model that is disruptive and then succeed in actually grabbing market share from all companies. The same principle might apply to developing countries.

Is this a reason why Russian government, for example, decided to begin from scratch in Skolkovo instead of investing into older structures?

That is truly what the whole Skolkovo concept is. And it is connected with frustration that some of your leaders have about Russian academy structure. No question about that. It is not easy to succeed, but that is the idea.

According to you, in order to create a good portfolio of a country there should not be just one strategy. Not only the government should invest in Skolkovo, but also support other innovation centers and research institutes of the old system?

I would not be that specific. I would say that a brilliant government strategy should involve portfolio of different activities that range from trying something that is entirely novel to trying to take novel approaches to reform the old structures where it makes sense. So, for example, you have embedded industry, old gas and oil industry. It does not mean that there are not innovative ways to convince those companies to try to become leaders in some area of clean energy or clean technology. You have embedded chemical industries. It does not mean you could not find ways to move some of those chemicals to corporate companies into green innovation space. You have great universities that have not operated as innovation system. But it does not mean that there are not clever strategies that one can use instead of waiting for the creation of entire new universities. To be able to reform from within those universities maybe operating from low. Those are the kinds of advice New York Academy of Science is actually is going to try to provide to the Russian government. It is a new report we are working on now and in the future.

Would you please comment on innovation policies of the countries you are familiar with?

You are asking me to give the results of the report that we are going to deliver to President Medvedev. Just to give you few highlights and a little bit about that. Our report in particular interviewed roughly 40 experts from all over the world to ask them to help us to identify, along with the literature that other countries have made?

And we ended up concentrating for this first stage on Israel, Finland, US, India, Taiwan, and Russia are as examples. And just to give you a little idea, I could say something of the following kind. Let's take Israel as an example. For 62 years one of its strengths has been that it created a public

– private partnership and a policy reform that encouraged the Israeli people and their entrepreneurial spirit to be innovative. And the result was that it has the highest per capita rate of entrepreneurship in the world. That is known. But that it is success does not mean it has no challenges. One concern that our experts say was that it has over focus on just information technology. The question is will it have long term sustainability if it cannot broaden the portfolio of innovation that is engaging in? It is a challenge for a small country to do that.

Similar case is Finland. Everybody knows it is very unusual national policy that opened the market, deregulated their industry, liberalized their trade and investment and actually provided state agency funding. They were able to encourage the creation of Nokia, IT sector explosion which for a while made Finland economy very strong. But once again, it is not a 100% positive situation because it is a small country. Nokia may lose market share. What does it take to be sustainable over a long run. These are challenges of a small country. And Russia is a large country and it should be able to look beyond. If it could create 3 or 4 different areas of innovation so that it would not be dependent on one or two like Israel and Finland, it would be in a way better shape.

Speaking about Israel, was not it the immigration wave in the 1990-s that caused the “economic miracle”?

It is absolutely no question that the inflow of talent, whether it is to any given city or country, brought huge advantages. In case of Israel Russian talent alone brought huge advantage.

You are getting at a point that I was going come to later. One of the greatest weakness of national policymakers is that politicians cannot think of building structures. They are building cities, building infrastructures and they do not actually develop a community of talent that is going to drive innovations in those structures. So, absolutely correct that one of the Israel’s advantages was the ability to attract new talent and keep it. They also have success in sending their young people to universities outside of Israel and then getting some of them back because they have pride in their country which is, of course, a big challenge for many countries around the world.

Another example of success in that area is China. They did a spectacular job in bringing back roughly 20% of the most talented young people who get trained in the West. They come back to China and establish their own laboratories. There is no question, your point is absolutely correct. One of the most important elements in a great innovation system is talent. You can spend all the money in the world but if you have not fostered entrepreneurial talent you will not have any innovation.

Will Russia, like China, in the nearest future be able to bring back its scientists that moved away?

If Russia invests the energy to get young people to come back, they would. What China did was not a trivial activity. First of all, as you may know, China offered a huge amount of money to people to come back. If young scientists come back they get salaries that are higher than they would have had if they stayed outside China. Second, the universities and individual cities established laboratories with equipment so fantastic that even if they were working in San Francisco, or in a great universities such as Yale or Columbia or MIT they did not have better equipment. In some cases China

gave them better equipment that they even had in the US to work with.

The third factor, that is quite unique, is that in many cases China would not allow the old faculty members to be bosses of these young people who were brought back. They would give them independence, they would give them ability to have their own laboratories, to run their own students without interference from the leadership of the universities. It is quite unusual. Beyond all that, they permitted those young stars to retain half time positions in the United States or Europe in universities where they came from. So this appears to be doing a favor to those other countries. But what it does is that it establishes partnership or alliance with the best global universities and young people do not get isolated when they come back to China.

So that is just four examples of a very visionary policy that came from the top. In fact, I was the first non Chinese journalist to interview Jiang Zemin, the President of China in that time. He said to me straight to my face that his most important goal is to get these most brilliant young scientists of China out into the world even if it was politically difficult for them and bring them back to be the leaders of the next generation.

So if Russia has this kind of visionary devotion to its young people, I do believe it will bring many brilliant young people back who are in the Diaspora.

Speaking about the US, in what way the government is involved into innovation system and how does it help new companies to create innovation? How strong the government innovation policy is?

The biggest single roadblock in my mind is that most countries that are trying to be innovative have what we call the silo mentality where individual universities, individual departments, individual faculty members all live in their little silos and do not operate in partnerships that would create synergy. And they do not get leverage from being allied with other thing. So you find this within universities, you find this between universities in the same city where they will not work together, you find it between the university and industry, you find it between the science and finance communities within a city. So this is what we call the silo mentality. And one of the most crucial policies that any government can do to try to improve innovation system is to create financial and other kind of incentives to break down those silos, to create network and bring people together, and bring institutions together to work for common good. And gain, it is very different from creating a single university in a single place.

I will give you one example. Something that we would like to work on with Russia. That is, while they are building Skolkovo outside Moscow, we would like to try to help them develop mechanism that would identify the most promising areas within Moscow, promote public-private partnership between different institution and create public-private partnership to drive innovation in Moscow region. Basically, Moscow right now is living in a silo mentality.

Why in Moscow in particular? What about cities in Russia?

Same thing for Nijnii Novgorod, same thing for Novosibirsk, same for St. Petersburg. Absolutely, I would think that a good Russian national policy will look at Tomsk and Omsk. What is crucial to the places I have mentioned?

All of them have large number of talented young people. And you cannot create innovation without talented young people. One of the biggest headaches for Middle East, countries like Qatar, Abu Dabi, Dubai, Saudi Arabia, with all that money in the Persian Gulf is that have no students. In Russia you have students, but you are not yet investing the money in putting together the networks of innovation that are needed with young people that have to be mentored, and they have to be taught to be entrepreneurs, they have to learn how to take risk, they have to be supported when they have failures. There should be prizes. All of these things are the things that Russia needs to do.

Right now, one of the most interesting trends that we see at New York Academy of sciences in the world is that world has become like early Renaissance Italy. Instead of thinking about competition between nations you see this enormous competition between the great cities of the world, which all try to capture talent. So, you have Shan High versus Beijing, Deli, London, Paris, New York, Boston, San Francisco. All of these cities have a lot of students and talent. Moscow, Nijny Novgorod, Novosibirsk, St. Petersburg, Mexican city, San Paulo, Buenos Aires could all be in there. This is where the action is likely to be because they have talent.

But those rich countries in Middle East you were talking about, with all their money they could have attracted scientists from all over the world?

They are trying to do this a little bit but they have no cultural tradition of welcoming people from other places as equal citizens. They have a bit of a problem with that. You have to have a country that does not only want to bring back most talented people that left it but you also have to have a country that wants to welcome people from other traditions and other societies. Which is why we admire Israel, and why the US has worked so well. Europe is now desperately trying to learn how to bring people from different cultures.

The president of China told me straight in the face: "I think the reason the United States will win against Europe is that I went to Intel and they introduced me to their employees. And I saw people fro, all over the world". This is a single minded idea but it is very important.

One of biggest things that national policy forgets community development. This means that you make sure that you have students, that they are well trained, that they are mentored to be entrepreneurial, supporting them in being entrepreneurial, bringing in the one from other countries. All of that is often forgotten about.

To your opinion, will Russia succeed in building innovation economy?

I will be able to answer this question if I am invited spend the next six months or a year working with Russian leaders because I know that there are a lot of smart people that have concept. But there are a lot of great ideas in the world and the proof of success is when something is actually done. So until we see these ideas being put into practice it is very hard to say. For example, I am trying to work with universities in Moscow, to establish new alliances. I talked to minister Kudrin, he has a lot of good ideas, but I need to see what happens to them. I have seen countries that have very exciting start but then they have big challenges. India is a very good example. They have brilliant people imported by the government from the industry, but overcoming

embedded tradition is so difficult. It will take some time to Russia.

As I have already said, In Yaroslavl we will be delivering a report to Russian president Dmitry Medvedev, and that will be the end of what we hope will be a stage one of our partnership with Russia and its leaders. The question for us is what happens after Yaroslavl.

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