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Science and Technology Parks in Open Innovation development: "One type fits all?"

Plenary Session 3:
Innovation and business country culture in relation to the development and success of STPs

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ABSTRACT

As villagers in Africa and Bangladesh have gone straight quantum leap from no phones to mobile phones, developing countries could leapfrog as well with other innovations. The nature of innovation also changes, and is speeding up. Other periods have seen bursts of considerable technological progress: the introduction of the telegraph, for instance, was equally as disruptive as the internet today.

Some developing countries already have higher levels of "early stage" entrepreneurship, as more people engaged in things such as starting new ventures—often because the need for doing so is greater. In many African countries, the users are about to take the worldwide lead in using mobile phones for payments and remittances, thanks to the introduction of schemes like the M-PESA money-transfer service introduced by Vodafone and Citibank group in Kenya. These allow people to send money by using text messages.

Now the centrally planned approach is giving way to the more democratic, even anarchic, new model of innovation. Good ideas have always been everywhere, but companies were often too closed to pick them up. The move to an open approach to innovation is really more promising.

Unfortunately the government planners, often obsessed with national innovation policies and in a need to create clusters like Silicon Valley, have not learnt the lesson. History also shows that countries that come up with new technologies are often not the ones that commercialize or popularize those inventions.

The hypothesis is to stop spreading money around trying to clone lots of Silicon Valleys. Besides, there is an even more important factor than money: the culture.

KEYWORDS

Technology Parks, Science Parks, Open Innovation, Regional Innovation systems, Regional development, Clusterisation

1 Introduction

As of generally accepted approach, innovation is the key to global competitiveness; it is not necessarily a zero sum game. On the contrary, innovation processes that tap into the neglected intellectual capital and connect it better with financial capital can help both rich and poor countries prosper. This is starting to happen in the developing world.

Patents are becoming much less important nowadays than brands and the speed at which products can go to market. Some of the rising stars in developing economies are beginning to take out more patents, but many of the innovations are still kept quiet as trade secrets. So fluid are the markets, and so weak the patent-protection in them, that companies often prefer to keep things in the dark, and come up with the next innovation necessary to stay ahead of the competition.

Even in developed markets, the need of accelerating the innovation is making patents less relevant. Industrial leaders are increasingly turning to most trusted brands to simplify things for their customers. Open innovation also appears to keep corporate bureaucrats cautious, making companies tougher at competing. For a business that uses open and better networked innovation, it matters less where ideas are brought up.

Globally, the estimated number of technology intensive parks/incubators vary from 300 to 3,500 worldwide (WATCH, 2002), the numbers in North America and in Europe are estimated at about 1,100 plus each; Asia has roughly 700, and the rest being balanced between South America, Africa and other countries. In Europe, the majority are in Germany, France and the UK. Interestingly, while incubators in industrial countries serve a variety of objectives, those in industrializing nations are predominantly focused on technology.

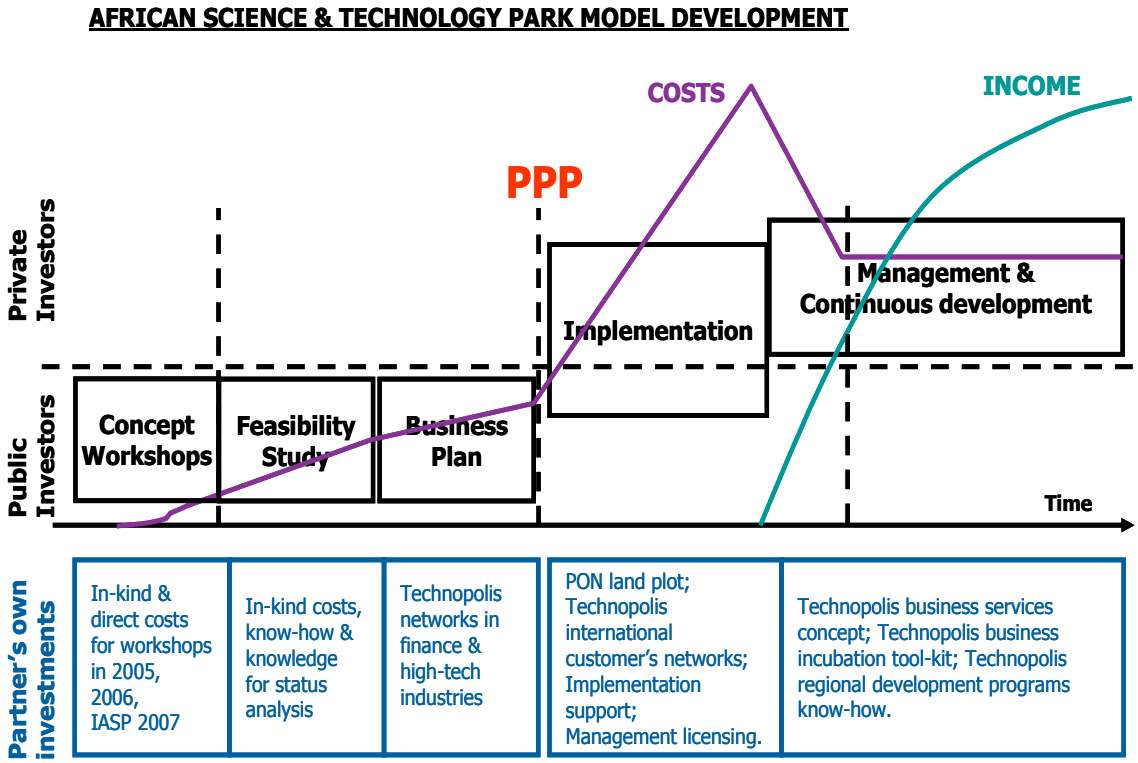
The developing countries are naturally lagging behind in the volume and the intensity of STPs in relation to post industrialized countries. There are, however, exiting successful cases in developing countries where significant, even commercial operations like Busy Internet in Ghana, have been established.

There are extensive amounts of studies handling the issues and problems of regional technology and science parks, like (BRUHAT, 1996), (KAUTONEN, 2002) and (MÄKI, 2001). Although the external circumstances apply to all science parks, regardless of the specific financing method of a technology park, a successful initial public offering (IPO) can be considered a good benchmark method for well developed growth ability. Typically owned by public investors, such as regional governments or universities, the aims and objectives differ from those of publicly listed companies in the same operation segment.

The profitability and growth problems of technology parks and incubation environments have been long term. As an example, in 1983 the board of Technopolis Plc went for a study tour to universities and science parks in Edinburgh, Glasgow, Birmingham and Cambridge. The lessons of the trip were that the traditional university incubator model did not work, as the business and scientific work was not operated within the same concept.

Managers must focus on extracting value from ideas, wherever they come from. Stewart Brand, an artist and an internet pioneer, is convinced that if you want to see the next wave of consumer innovation, “look to the slums of South Africa, not Japanese schoolgirls.”

2 Status quo



Science and Technology Parks, when designed and operated in an orderly manner, can be excellent places for nurturing such open innovation environment. In Africa, where chaotic and corrupt rule can restrict growth in myriad ways, extraordinary innovators are starting to flourish wherever they are not choked off by bureaucrats.

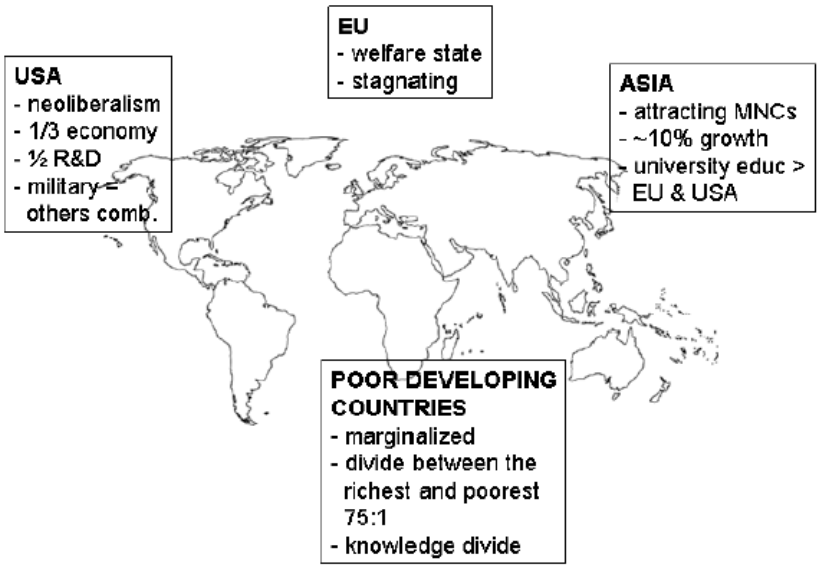
Allowing some simplification, Himanen (2004) claims that there are currently three especially dynamic models in terms of technology and economy, yet they are based on very different social models. These can be called by the following titles:

1. The "Silicon Valley model", i.e. the American neo-liberalist model - the predominant model (United States)

2. The "Singapore model", i.e. the Asian state - run model in which the objective is to attract multinational companies to the region - an emerging model (also in China and India)

3. The "Finnish model", i.e. a European combination of the information society and the welfare state, which is represented in its most advanced form in the case of Finland.

In the following section, we are examining the innovation systems from the above presented division whenever possible.



2.1 Stanford University and Silicon Valley

The United States alone accounts for one -third of the world's economy and half of the R&D work carried out in the world, and its military budget almost equals that of the rest of the world. The development of the Silicon Valley has to be understood in this context.

The formation of the Stanford University and it's and the Silicon Valley is unique. About 40 years ago, Stanford University had some financial problems. The authorities of university tried to solve the problems by leasing part of the university land to high-tech companies for 99 years.

But what are the growth factors, claimed to be present in Silicon Valley? The distinctive to Stanford is that the land leasing scheme operated by the university has created steady flow of funding to the University which has in turn invested the wealth back to research and development work within it's focus areas. Saxenian, (1984) has further claimed several distinctive factors that have affected the "supernova" development of the area:

Job mobility statistics show the success of these networks: the average job turnover rate for small-to medium sized firms was 35% and the average job tenure (in the 1980s) was approximately two years (Saxenian 1994). Geography probably also played as critical role in this rate as the informal social contacts. The spatial concentration of a large number of technology-based firms enabled people to change employers without altering other aspects of their lives.

The result is that the engineers developed strong loyalties to technology and their fellow engineers and scientists while possessing far less allegiance to a single firm (Saxenian 1994).

2.2 Singapore model

The "Singapore model" applies to most of the Asian economies, such as South-Korea. As a good example, in 1973, the Korean government initiated a plan to establish a major high-technology research complex, called Daeduck Science Park (DSP). The Ministry of Science and Technology (MST) designated 27 square kilometers of land in Taejon, a city of 1.3 million people (1999) for the creation of the park. By 1998, the DSP had grown to host some 60 institutions employing about 12,000 scientists and technicians, and approximately 5000 support staff. Shin (2001) has researched the process involved in developing the DSP. The typical technology and development activation schemes were used, such as heavy tax incentives and deep governmental guidance on industry policies. Shin (2001) has also stated that, "it is true that many of them moved into the area not because they could benefit from the relationships with other research units, but because they were required to do so by the government".

Many Asian countries develop at an annual rate of around 10%, and the tendency is that global production and markets are increasingly moving to Asia. It is expected that In the IT field, for example by 2010, half of the world's semiconductors are consumed and a third of them are produced in Asia (excluding Japan). For example, Chinese Universities are currently educating more experts in science and technology than the EU or the United States (in 2000–2002: in China, 590,000; in the EU, 440,000; in the US, 385,000). A global market for expertise is about to emerge, where the development of Asia forms a completely new challenge to Europe, USA and more generally developed countries. The EU clearly lags behind the United States, for example in terms of the region's attractiveness to Asian experts.

Himanen (2004) claims that the Singapore model is based largely on tax competition, i.e. "a race to the bottom". This has also been a dynamic model, although the limitations and problems of competition have recently become evident. Also other countries can always reduce their tax rates more in order to attract multinational companies, and as a result production keeps moving to cheaper and cheaper countries. In the case of Singapore, companies have moved, for example to China and India. The outlook is threatening in the long run if the region has not developed adequate local expertise and innovativeness. For the Singapore's advantage, exactly this has happened in the Singapore case. If a region is to succeed in competition in the long run, it must have innovative ability; it is not sufficient that the government takes action to attract multinational companies.

The Singapore model is also patronizing, which creates other additional problems: the government attempts to control its citizens' freedom, although the information society cannot be creative if people do not have free access to information and the freedom to think otherwise. This is a great paradox also for countries like China and Korea, which idealizes the Singapore model.

2.3 Finnish model

Indicators which describe the science and technology inputs and outputs and, the scientific and technological development of different countries have been developed internationally (e.g. EU/Eurostat, OECD, UN). Countries are then compared on the basis of these indicator sets. Finland has shown up well in these comparisons and a wide international interest is directed towards the country as the developer of competitive technologies, an agile adapter and exporter.

During the 1990s, Finland underwent the most vigorous economic growth in its history, after the collapse of Soviet trade and simultaneous release of the free flow of international financing. This was the first time in history that the country's industrial and commercial structure was changing fundamentally: the focus had to be shifted from raw materials, capital and energy to knowledge-intensive and expertise-oriented activities. From a period of slow growth and low contributions, Finland has moved to an era of rapid growth with opportunities for high contributions.

At the same time, Finland has also become part of a global economy with fluctuations and high risks imposing new threats. The businesses' economic and political environment is currently undergoing a dramatic change that will have a major impact on how innovation and innovative processes are understood.

The current economic change and particularly globalization is often referred to as a new economy where knowledge and the related technology and innovation constitute the primary driving force. Finland has been able to take advantage of the development as a nation, thru its regional development systems.

Although regional development research has been done extensively the interaction of innovation activities, technology development, tacit information, social capital or networking has been studied relatively little. In Finland, and more generally in Nordic countries, there has been extensive research about the issues.

In Finland, the efficiency differences have been growing between the regions during the time period 1988-1999, according to Susiluoto (2001). In the 1980's the difference between the strongest and the weakest links was 30 per cent, the difference had grown to 40 per cent in the 1990's. Regions, whose proportionate position dropped more, were the smaller and more remote regions. According to Kostiainen (2002) the urban regions have been changed into new operational environment, where globalization and competition of firms and skilled labor is leading the regions, rather than nations, into rivalry.

The competitiveness index of the region is consist of areas reach ability, concentration, innovation activity and human capital. Huovari et al. (2001) have valuated Finnish' regions development potential on a long run by formulating a competitiveness index. Significant is that the best scoring regions are equally good on almost all of the measurement areas. It is not surprising that these areas

tend to be centric regional cities and university towns. The competitiveness index correlates also very well with the economic well being of the area.

The public financing of R&D efforts has not superseded the private financing in Finland. The increase in the public sector financing by one per cent increases the private research and development expenditure by another per cent. Lehto (2002) has researched and in measured local levels, that 0.5 per cent additions to the R&D expenditure in a regional level have increased the whole regions R&D expenditure and has actually benefited the company's total productiveness. This has been called as a "spill-over" –effect.

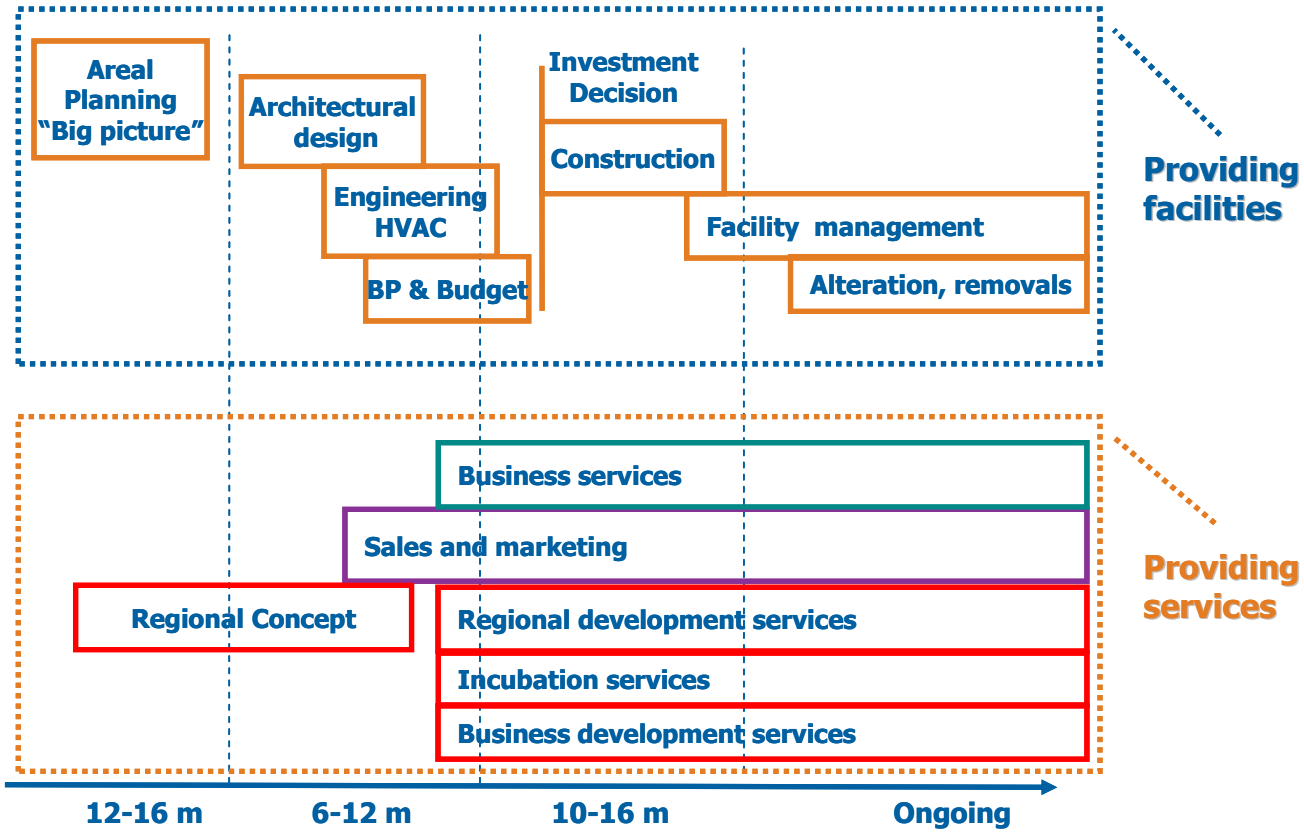
Hanell (2002) has compared Nordic regional innovation systems to each other, and has found that Finland has been most active among the benchmarks has been bringing national models into the regional level.

3 Grants or Investments?

There are too many technology parks in the world that are still caught in the institutional or publicly supported phase of development. The biggest challenge in the future for most of them are to move into the entrepreneurial phase of development. If there is no success in this development, these places will remain as no more than subsidized "high-tech promises" in a globalizing world of rapid technological innovations.

Although the success of a technology park company naturally depends also in large sense from external and internal factors, great deal can be judged from its strategic choices and decisions.

The present status quo in developing countries is that STP are mainly public investments, far too often resembling their paragons in developed countries. The funding is in large sense public, without private demand on return to the investment.



The internet and communication age of today is producing ever more semi skilled labor in developing countries, where there is still scarce amount of opportunities for these young graduates.

Although the income differences in the developing nations are high and tend to even increase, the driving factor is modernized communication methods and access to information that allow entrepreneurism. Even with a know phenomena of "Nigerian letters" one can find the chance components; access and entrepeurism.

There is seldom large scale development unless there is a grassroots activity. The public sector should provide means of channeling this energy into actions that better serve community. Microloans are present successful tools utilized within different segments in developing countries, but should be equally tested in the field of technology development and start ups as well, as a sample of the toolset. The instruments themselves should be naturally tested and adjusted. Even to lower the threshold, the STPs and incubators can act as management and host organizations in providing the needed platform.

4 Conlusions

The history of innovation, merely an example of closed innovation, is filled with elites and centralized processes.

This can be simplified, companies, not regions, are competitive. So the question for all governments is: how to attract many competitive firms?" That throws cold water on cluster obsessed politicians. It also points to what are sensible actions to promote innovation.

This explains why the best innovation policy is probably one that does the least. Liberty is generally a powerful force. In the past, innovation was dominated by elites—the "wealthy gentlemen societies", for example—who had privileged access to information, money and markets.

Everyone wanted to learn how Silicon Valley was created, and how it has managed to keep its position despite various booms and busts. Asia also made its mark, with innovation environments from places like Singapore, discussing about how many billions of dollars they are spending on technology parks, tax breaks on foreign investment and scholarships for their bright young performers in elite Universities.

The French have poured billions into pôles de compétitivité; Dubai and others are doing much the same. There are many aspiring clusters worldwide, nicknamed Silicon Fen, Silicon Fjord, Silicon Alley or Silicon Bog. Normally governments pick a promising part of their country, ideally in the neghbourhood of a big university, and provide lot of money that is meant to kick-start entrepreneurship under the guiding hand of the bureaucrats.

This has been a major failure. The high-tech clusters in Oulu, Finland and in and around Cambridge, England, are the most often-cited counter examples. The main problem nevertheless seems to be, that the inventors never want to grow up, they are happy with modest success. One veteran of the Cambridge start-up scene even argues that its success came "in spite of, not because of" government and university support.

Nokia's performance was not the result of far-sighted planning or subsidy by the government of Finland. One Nokia executive tells: "The biggest boost to the firm was the deregulation that followed the Second World War and the government's avoidance of protectionism. And also, coming from such a small and open market, Nokia was forced to think globally".

Secondly, governments are still keen to promote centralized innovation policies to look out for market distortions and over-regulate that that can strip away potential small entrepreneurs in the markets. Entrepreneurs can face an uphill battle legally, not just culturally, in many countries. The bankruptcy laws in many places are excessively burdensome, also banning failed entrepreneurs from running a company for years.

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