



Building Innovation System to Upgrade Shanghai Innovation Capability

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Some notes on innovation system theories

- Innovation system theories initially came from National System of Innovation (NST) which was put forward by C. Freeman in 1987.
- Freeman, Porter, Lundvall, Patel and Pavitt, OECD contributed a great deal to the establishment of the theory.

- With the development trend of globalization elements and resources around the world are concentrating on cities with brilliant individuality. It is more in evidence that economic development is becoming regional and individual.
- Regional Innovation System (RIS) brought forward in the late 1990s. Main theories includes cluster theory, enterprise-university-government union theory, innovation network theory.
- Some cities in China begin to pay attention on the building of regional innovation system.



Learning from the experiences of some international metropolises

United Nations Development Programme (UNDP) published 46 technological innovation centers in the world in 2001.

- New York, Tokyo, London, Paris, Los Angeles
 - Silicon Valley, Boston, Austin, San Francisco, Kyoto
 - Hong Kong, Taipei, Singapore, Kuala Lumpur, Xinzhu
- Non city in Chinese Main Land is included .



1. New York

- Develop dominant technologies. No matter what financial center in 1980s, new medium center in 1990s and life science center facing new century, New York takes up with developing key advanced technologies and promotes to form industry chain.
- Government-University-Industry Innovation system. By making policies to encourage enterprises to develop new technology and product, by setting up technology centers to diffuse technologies to firms.
- Vigorous human resources. New York has first-class scientists and establishments for scientific research.
- Immigration of technician and scientists.



2. Tokyo

- Deepen Government-University-Industry union. Government encourages university and enterprises to set up research centers together.
- Revenue preference, financial support to encourage hi-tech industry development.
- Expand venture capital. Government supports investment in hi-tech industry development.
- Emphasize small and medium sized firms' function in technological development.



3. London

- Set up Knowledge centers, city government constituted “Strategic Programming for Science, Knowledge and Innovation”.
- Create innovation environment, establish E-community and incubator.
- Pay more attention on small firms, set up Innovation Group Fund.
- Emphasize small and medium sized firms’ function in technological development.



4. Hong Kong

- Introduce new technology in time.
Not search for hi-tech but suitable and fast mi-tech, focus on commercial benefit and market demand.
- Follow market trend and be adept at imitating innovation.
- Be active to carry on scientific and technological cooperation.
- Pay attention on the function of colleges and scientific and technological agency.

Factors affecting Shanghai innovation capability upgrading

4 index of S&T development of Shanghai (1998-2002)

	1998	1999	2000	2001	2002
R&D/GDP	1.51	1.58	1.69	1.78	1.89
Contribution rate of S&T progress	43.87	47.16	50.30	50.98	53.08
Output of hi-tech/industrial output	16.5	18.2	20.26	21.8	23.40
Hi-tech product export/total export	13.52	17	18.9	19.6	23.3



- Innovation capability is not strong and initial innovation is insufficient

Every year there are more than 4000 authorized enterprises patents in Shanghai. But only about 200 belongs to invention patent. i.e. invention with comparatively high creativity accounts for only 5%. The percentage in IT and automobile industry is less than 1%.



- Be lack of effective scientific and technological encouraging mechanism

Most colleges and institutes emphasize the number of papers, research projects and expected benefit when manage and appraise scientists and researchers, as a result, the advantage of basic research in Shanghai is shrinking.



- The transformation rate of scientific and technological results is still low
 - Rhythm of transformation is slow, some research outcomes have been washed out before they are transformed, especially in IT industry.
 - Interests distribution is not in reason.
 - Policy support is not in point.



- Reconstructing function of science and technology on traditional industry in not effective

Shanghai's automobile industry has been developing for several decades and now become the most important base in China by using foreign investment in the past 20 years. But engine is still imported. We still has not had our own brand.



- No famous scientific and technological brand

In appraising through national comparison in 2002, Chinese name brands in Shanghai are mostly in traditional industries. Non of them are in hi-tech industry such as IT, biology, medicine, new material and so on .

The main reason is that hi-tech industry development in Shanghai still depends on joint venture and introducing key technology.



- Scientific and technological exchanges need promoting
- International metropolises such as New York, Tokyo and Paris are all important centers of technology trade. Their technology trade and transfer account for more than 30% of GDP.
- there is a lack of cooperation of hi-tech parks in Shanghai with other parks in the world such as Silicon Valley.



- Scientific personnel are not international
 - According to international standard, percentage of foreign people should reach 5% and above for a international metropolis, but it is less than 1% for Shanghai.
 - human resource as a whole are short of strategic thinking and international insight, few of them hold capability of cross-culture operation.
 - All industries are lack of personnel suited to WTO.



- Hi-tech parks do not play an important role in hi-tech industry development
- The key function of Zhong Guan Cun Hi-tech industry park in Beijing's hi-tech industry development is very outstanding. Many universities and institutes are in the park.
- The mode of Shanghai is that Shanghai Hi-tech Industry Development Zone is made up of 6 separate parks. Non of them is built near any universities.



Some suggestions to build Shanghai innovation system

- To foster innovation organizational system mainly including enterprises, universities and institutes.

The key is to sufficiently bring their special functions into play and to form a network organization system of interaction.



- To build innovation investment system dominated by enterprises

Government should change the role from dominated investor to investment driver, pay attention to the construction of public innovation centers, incubators and promote the formation of new investment structure dominated by enterprises.



- To build uniform market system of scientific and technological factors

The aim is to make effective and smooth moving of innovation resources, especially scientists and technician.

Emphasize the construction of development system of innovation personnel.



- To perfect service system for scientific and technological innovation

technology trade center, technology transfer center, enterprise incubator, S&T consulting organization, appraise organization of technology, broker of technology.



- To build law and policy system for innovation
- To adjust the function of government in innovation system

Government is organizer and supporter of innovation, should concentrate on basic research, modern service industry, policy making, organize key research projects.



- To improve venture capital structure and operation environment, to perfect venture capital investment mechanism

For Shanghai capital is still a bottle-neck in hi-tech industry development. Actively introduce foreign and private venture capital, transform the former administration and policy function to market function.



- To breed innovation culture and encourage innovation enthusiasm of entrepreneurs

For many years Shanghai collected many adventurer by right of its position in the world. But an embarrassed phenomenon is that very few famous entrepreneurs are brought up in Shanghai.



- To found Shanghai scientific and technological brand

S&T innovation is core and brand is soul for construction of city innovation system.

At present, 84 of 100 world famous brand have experienced brutal competition for more than 50 years. So must build up backbone and work hard to create S&T brand.



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Thank you

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