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Globally Networked STPs – Platform to foster knowledge-based regional economy in China

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STP Services and Regional Needs

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Globally Networked STPs – Platform to foster knowledge-based regional economy in China

"All that is needed for a new universe is a new mind." William Carlos Williams

Executive summary

In 1978, China embarked on a policy of reform that opened its doors to the rest of the world, helping to make China an economic superpower. Technology-based economic development & resource-based advantage started to take center stage to drive its economic growth, especially in the exports. In a recnt National12th five-year (2011–2015) plan aims to shift the world's secondlargesteconomy from an export-driven and resource-based advantage into an innovation-driven global powerhouse. The key to achieving this will be for the nation to enhance the ability of its economy to innovate aggressively. Yet China's record on this score is mixed. A dramatically different mind-set is required to develop new models of collaboration in which leaders and professionals as well need to rethink how to recreate places for education, R&D, and sustainable economic development. This paper describes the approaches taken by the Institute (NJU-NYU/POLY Joint Institute for Innovation & Entrepreneurship[1]).

[1]The Nanjing University & NYU-Poly jointly established the NJU-NYU/Poly joint Institute for Innovation & Entrepreneurship) in October 2009 to provide education & training on subjects related to innovation & entrepreneurship.

New Challenges and Opportunities

The existing economic engines, STPs and Hi-Tech development zones,were all started in the last three decades. Their development strategies have been focusing on setting "preferential" policies, building modern operation infrastructure, creating incentives (tax waivers, free rent), and providing finance supports to attract businesses based on job creation, especially those foreign invested manufacturing plants. In an export driven economy,most of China manufacturers take orders from Western companies that have designed products for their home markets. And many Chinese companies have no involvement with product development, innovation, market research, and even packaging. Also due to various policies and beaucratic administrative criteria, financing for business came primarily through family funds for small business, or big banks for lending to state-run companies. There was no angel or venture capital investment networks, until more recently, to help spur growth and improve innovation. Many businesses that would benefit from an incubator environment are denied access because of overly rigid administration criteria, and many new companies enter the incubators never graduate because of a lack of adequate support networks. This means that in many cases communities and/or universities have invested in incubation programs that either failed or didn't provide meaningful returns on their investment.

China's 12th Five-Year Plan (FYP), 2011 - 2015, aims to restructure the Chinese economy by encouraging domestic consumption, developing the service sector, shifting to higher value-added manufacturing, conserving energy, and cleaning up the environment. In essence, the economy growth structure is moving from the export-led and resource-based advantage structure of the past 30 years toward a pattern of growth that is driven increasingly by Chinese consumers and innovation-based advantage.Scientific development and moving up the value chain sit at the heart of the 12th FYP. The key to achieving this will rest on enhancing the endogenous innovation capacity.However, this has also presented great challenges to the country as a whole, more precisely;

1. Production Life Cycle Management - As indicated earlier, most of China manufacturers take orders from Western companies and they have no involvement with product development, innovation, market research, and even packaging. Changing to domestic consumption means to restructure their business operation – from focusing on manufacturing process to the whole product life cycle management. The "know how" from business and technology management is a huge hurdle to overcome, especially for those Small & Medium size companies
2. Market Efficiency – Even though the private sector generated approximately 70% of GDP in 2005. Under the Socialist Market Economy, where to enter and how to enter the market place itself presents great challenge to them, especially for those who would like to enterinto the ICT(Information & Communication Technology) industry, which is still largely dominated by the SOEs (State Owned Enterprise). For example, VOIP (Voice over Internet Protocol) is still not opened up yet in China, thus features like SKYPE does not have much room for "experimenting". How to open up the most active and innovative ICT platform, Internet,to attract various types of talents for competition presents a great challenge for the government policy makers

3. Complexity of Innovation –Capacity to innovate cannot be equated to the capacity to invent. Simply, any successful innovation takes tremendous efforts across science & technology, social technology, and business management three major disciplines; more precisely, it takes a higher order capacity that includes elements such as the ability to create products based on technological breakthroughs and the ability to market those products well.At the same time, entrepreneurial firms require venturesome and resourceful customers who are willing to take a chance on their products and services. This "venturesome consumption" is especially critical in stimulating & encouraging the growth of high-tech based "domestic" enterprises and thus creating and strengthening endogenous innovative capacity. Good innovatorshave also exhibited critical"discovery skills"revealed in the book,"The Innovator's DNA" [2] , written by Clayton M. Christensen and those skills have given them the unique ability to integrate and consume big new ideas (or breakthroughs), no matter where they're spawned. Entrepreneurship is, far from being spurred for the most part by lone, heroic individuals, a social process that stems from a broad set of social and cultural conditions, which is a long-term process. How to foster an environment favorable for innovation & entrepreneurship is a $10 million question.

Framework forInnovation Ecosystem – Creating Innovative Community

Science and Technology increasingly appear as a main source of competitive and sustainable advantage for nations and regions alike.China's 11th FYP (2006 – 2010) called for 'scientific development.' - a key initiative in increasing the R&D-to-GDP ratio from 1.3 percent in 2005 to 2.5 percent by 2020. The 12th FYP places scientific development and moving up the value chain at the heart of the plan. However, the key determinant of their efficacy is the quality and quantity of entrepreneurship-enabled innovation that unlocks and captures the pecuniary benefits of the science enterprise in the form of private, public, or hybrid goods. In this context, linking university research with market, via technology transfer and commercialization mechanisms, constitutes the essential trigger mechanism and driving device for sustainable competitive advantage and prosperity. In short, people, culture, and technology meet and interact to catalyze creativity, trigger invention, and accelerate innovation across scientific and technological disciplines, public and private sectors (government, university, industry, and nongovernmental knowledge production), and in top-down, policy-driven as well as bottom-up, entrepreneurship-empowered fashion form the essentialingredients (or culture) of an innovation ecosystem.Based upon this conceptual framework and principles, we are adopting "quadruple helix innovation model" to develop our roadmap to explore Nanjing Metropolitan economic development.

The TH (TripleHelix Innovation)Model

Innovation is increasingly based upon a "Triple Helix" of university-industry-government interactions. This approach originated in Boston during the Great Depression of the 1930s, and has since spread globally to be used as an operational strategy for regional development. Under this operational strategy, the role of university in incubation of technology-

[2]The Innovator's DNA – mastering the five skills of disruptive innovators by Jeff Dyer, Hal Gregersen, and Clayton M. Christensen

based firms has given it a more prominent place in the institutional firmament. The entrepreneurial university takes a proactive stance in putting knowledge to use and in broadening the input into the creation of academic knowledge. As firms raise their technological level, they move closer to an academic model, engaging in higher levels of training and in sharing of knowledge. Government acts as a public entrepreneur and venture capitalist in additional to its traditional regulatory role in setting the rules of the game. Moving beyond product development, innovation then becomes an endogenous process of fostering an environment favorable to regional economic development.

The Institute has adapted the "Triple Helix Space – the Knowledge, Innovation and Consensus Spaces" as its working model to facilitate the interactions among various agents inside the major three spheres. The spaces are related to the three functions of (1) wealth generation (industry), (2) novelty production and new knowledge creation (academia) and (3) policy and public control (government). STPs and Incubators can be seen as the "intersection" entities (or physical environments) in which these functions are realized and hence to foster and facilitate the transformation of the economic structure. Guided by this conceptual framework, Nanjing city government has led the way to take proactive step in creating supporting environment for the high-tech industry segment:

Government - Nanjing Entrepreneurial Talent – 321 Plan

In response to the 12thFYP, Nanjing city government has taking a "bold" step in building up "a new mind" talent plan – 321. It aims to recruit 3000 world-class entrepreneurial leaders globally, select 200 entrepreneur-led technology-based enterprises, and accelerate the acquiring of 100 well established scientists into the central government sponsored "Thousand Talents Program"[3] in the next three years. The goal, with these recruited talents, is to boost the creation of an innovative community to build up an endogenous growth capability and thus lead to the transformation of Nanjing metropolitan into a sustainable innovate-based economy. The city government has also provided "preferential" supporting programs to speed up the progresses for these 3s, 2s, and 1s. We'll only briefly highlighted 3s and 2s. As follows:

1. 3s – known as "Leader in science and technology entrepreneurship"

   Three types of entrepreneurs fall into this category: i) a subject matter of expertise, with broad prospects for market development, and has also established him/herself as a leader in the field of technology, ii) a person owns intellectual property rights or master in some specific technology and has demonstrated leadership in product development, iii)has start-up experience and is familiar with product technology and project management and desire to start their new venture here in Nanjin

[3]Plan,establishes by the Chinese Central Government Planning Committee, to recruitoverseas high-level talent(referred to as the "1000 Plan"), isaroundthenational developmentstrategic goals,starting in 2008, at the nationalfocus oninnovationprojects, key disciplinesand key laboratories, the central enterprises state-owned commercialfinancial institutions,mainlyinhigh-tech industrialdevelopmentzonesofvarious parks.

To help these entrepreneurs to realize their venture dream in Nanjing, the city government will provide 15 preferential policies to support the following areas:

- Business start-up support - mainly to resolve the process of setting up venture here such as registrtion,banking, the start-up capital, office building, venture capital funds for growth in the later stage; for example, based upon project type and its "relevancy" of the project, a start-up venture capital of 2 (or 3) million yuan will be provided, not less than 100 square meters workplace and not less than 100 square meters of apartment will be provided with rent-free for three years.
- Science and education training, extra technology R&D staff – Nanjing city has 53 Universities and more than 800,000 students and more than 10 government run STPs and Incubators. These resources provide a great talent pool for the start-ups and established enterprises as well. The city has also commissioned several well known institutes to provide advanced technology and management training programs to be available to the knowledge workers in the city. Special fundings have also setup for knowledge transfer from Academics to Industry and joint R&D collaboration as well.
- Financial and taxation support - This is designed to boost the healthy development of the start-ups in the finance area. Two types of preferential policies have been setup; one is for the start-up funders and the other one is for the angel investers or venture capitalists. To encourage angel investors and venture capitalists risk taking, the city government has various policies setup to protect their investment and also compensation policies be set should the invest fail. Intellectual property as security for loans, income tax incentatives, tax breaks and subsidies for imported R&D equipment, and special loans approval process for apartment purchasing have been setup for the founders.
- Living condition services – On top of the earlier established policy for talents, the city government will issue overseas talents "Nanjing blue card" so that the talents could enjoy being the residence benefits such as, children's schooling, and medical insurance.

2. 2s – "Technology entrepreneurstraining program"

This isan upgraded version of the 3s. It is targeting to a more mature entrepreneurs and also their start-up is up running with high potentials to succeed. In one sense, the selected ones are the entrepreneurial scientists. On top of the preferential policies applied to the 3s, the 2s also benefit from another 8 polices related to three areas; namely, 1. Thefiscal and financialspecial support – a premium package to relief their finacial burden so that they would be able to get focused on their offerings development, 2. special support forthedevelopmentofscienceandtechnology in terms of funding for new emerging technology so that they could enhance their enterprise ability to continuously innovate, 3. special support for the establishing their R&D teams such as making custom-made seasoned

advanced technology, business, and management training available to them to allowed a world class team be established timely.

To encourage the diversity of the 3000 leaders, the government has allocated 1000 slots reserved for overseas Chinese and foreigners. The first 351 of the 3000 and the first 48 of the 200 were selected and announced in the early February of 2012. These 351 are all in the pipelines of registering their ventures in Nanjing and they all would be located in one of the STPs and Incubators in Nanjing and the 48s would also be relocated to one of the STPs, if they are not there yet.

Responses to the Needs and Action Plan

Innovation Space

The Institute is a "hybrid" organization that promotes innovation and entrepreneurship. The Institute was set up initially to provide education & training programs available to university students, industry professionals, and government management. Starting the year 2011 summer, the Institute has been taking a broad role in facilitating the creation of an "innovation ecosystem" to nurture entrepreneurship through the following activities:

- Monthly speaker program – we have invited various serial entrepreneurs to the Nanjing University to give public talks sharing their personal experiences to university to students and industry professionals as well. In December 2011, we organized an "Open Dialogue" session to make the two university presidents, NJU and NYU-Poly, to have interactive dialogue with Nanjing University students. This event has attracted over 400 students to participate in the session
- Monthly NES (Nascent Entrepreneur Salon) program –There are 53 universities and 800,000+ students in the Nanjing metropolitan area. Engaging entrepreneurial students to fulfil their dreams in creating their own business is an initiative of the government for a while. However, a platform for young or nascent entrepreneurs to meet among themselves and learn from serial entrepreneurs on a regular basis is still lacking. In September 2011, we started the NES on a monthly basis. The attendance rose quickly from September 40s to 100s in November. We are in the process to make it a bi-weekly meeting, instead of monthly
- International Soft Landing & Innovation office – There are more than 20 STPs and Incubators in the Nanjing Metropolitan area. There are very limited networking among themselves. As a part of the promoting open innovation across regions. The Institute and the Nanjing Mofan Road Science and Technology Innovation Park have jointly set up an "international Soft Landing & Innovation Centre" to foster and facilitate the creation of "Innovation Networks" to harnessing the potential of Open Innovation globally

By working very closely with both NYU and NJY-Poly, the Institute is in the process of setting up an "networked incubator" to facilitate the commercialization of new "inventions" from labs to market and also foster the collaboration between faculties from the two universities. In short, the Institute is in the process of transforming itself becoming a new "hybrid"organization in the following sense: it is a part of a university entity responsible for the teaching and "business R&D" related to innovation & entrepreneurship, at the same time it is also a legal business entity offering commercial activities as any other commercial firms practice, except our mission is to maximize and optimize knowledge and innovation.

Recently, the Institute has been working closely with the Nanjing city government to support the Nanjing Entrepreneurial Talent – 321 Plan. We are taking charge of the training and coaching and mentoring program for the 2s to provide them access to business experts regionally and globally.

Consensus Space

The "Consensus Space" is essential a governance space and is closely related to the concept of leadership, which cuts across all the spaces. And this is where the Nanjing 321 leadership team resides. This team consists of key representatives from three spheres – University, Industry and Government.

The consensus space is different from the traditional top-down approach of leadership. The leadership comes from everyone in the organization in its own unique merit, not by power or position. Indeed, the Consensus Space is a mix of top-down and bottom-up processes to create leadership through collaboration rather than dictate, a neutral ground where the different entity can come together to generate and gain support for a new ideas promoting economic and social development and thus to improve the conditions for innovative based regional development.

Knowledge Space

Knowledge creation, diffusion, and use are the key issues in the knowledge space. In general, new knowledge is usually embodied in places such as universities, laboratories, centres of art and theatre, and other idea producing focus point. As indicated earlier, the triple helix operational principle is to facilitate the knowledge flow among various knowledge carriers. In general speaking, Chinese people value knowledge stock much more than knowledge flow. In various commercial offerings, you would often see or hear the phrase "ancestral secret or formula". To facilitate the knowledge flow, especially among nascent entrepreneurs, we have setup a bi-weekly NES (Nascent Entrepreneur Salon) to allow nascent entrepreneurs to get exposure to various people such as serial entrepreneurs, venture capitalists, and government officials. Meanwhile, the Institute also get started in establishing an"International Soft Landing & Innovation Centre" at theMofan Road Science and Technology Innovation Park to develop various programs to promote & the networking and collaboration opportunities among STPs, Incubators, and Universities regionally and globally. To further enhance the communications, the Institute also start to implement "Enterprise 2.0" in our website to enrich the "brain circulations" among various knowledge professionals.

Nanjing Government Officials have determined to focus their effort in the next 5 year to foster an environment favourable to innovation and hence to transform the economy structure. Knowing the complexity of Innovation, the government has also actively setting up collaborations with three global “innovation centres” to tap on those knowledge clusters and innovation networks to facilitate and speed up the changes as well.

Parameters for Success

Mind-set Transformation

William Carlos Williams said it well "All that is needed for a new universe is a new mind." Under the socialist market economy and also the traditional hierarchical social culture, it is always difficult for many people to view “change” as an opportunity.By and large, challenging the status quo is the biggest hurdle to overcome.As a part of our training program, we are designing a “total transformation framework” to be included in the next stage training program. The total transformation will be divided into three phases; the first phase would be working on the leadership transformation, the second phase is to working on the organizational transformation and the last phase is related to the sustainability of the transformation.

Hire the Right Management

Having a successful former entrepreneur or individual who worked closely with start-up companies at the helm of an STP/Incubator is important for many reasons. Incubator clients will need been-there, done-that advice, not academic theory or government “guanxi.” At this moment, the government operates most of the Nanjing STPs/Incubators and the management team is through appointment.

If STPs/Incubators are looked upon as economic development engine, they should be treated as business and need to be run by professionals who are experienced in meeting the needs of the companies that serve as their client base. It’s been recognized globally that “people climate” is much more important “business climate” (such as tax and rental reduction program, physical infrastructure,). With good management, STPs/Incubators can be profitable ventures that bring development into their communities.

Entrepreneurship

“Position” in a hierarchical society means almost everything. Most of the people are used to take “orders” from their superiors. Tracing back, all these get started from home and then getre-emphasized during their schooling years in aone-directional communication teaching approach. Accountability in such an environment is becoming meaningless often time; everyone has an eye on it, but, no one is in taking charge. And efficiency is suffering and business agility is being blocked.Due to various bureaucratic rules, most people are not willing to initiate the changes for a more efficient process. For example, the process of setting up a start-up is tedious and cumbersome, especially for foreign entities. On the other hand, Chinese “guanxi” plays a key role in speeding up the process.

Beginning year 2011, the leadership team of the Nanjing government is “filled” with an entrepreneurial spirit making changes toward a

betterpeople climate to attract talent globally. However, the first line of the officials are still staying “status put”, not catching up. Indeed, entrepreneurship is a social process that stems from a broad set of social and cultural conditions. The entrepreneurial impulse has to be embedded in a social ethos, especially in the government sphere, to succeed the transformation toward innovation-based economy the economy.

Fit the STPs and Incubators into the Big Picture

In a recent meeting, the Nanjing city government pointed out that a few of the STPs and Incubators are still being managed as a real estate business. Encouraging the growth of small business requires a coordinated environment. Managers of STPs/Incubators or better yet, the leaders of the communities establishing the STPs/Incubators should consider whether the existing industry clusters in the area contain the elements necessary to support new businesses in a particular industry. If the area has no businesses related to solar energy, then setting up a solar energy incubator is not likely to be successful.

Incubator developers must also consider whether there is sufficient access to professional service providers, capital, university technologists and other key entrepreneurial resources in a community before moving forward with a program. Indeed, an essential condition for creation and consolidation of the Knowledge Space is the existence of a “critical mass” of academic research and education resources on a particular topic in a local area.

Embracing Knowledge Flow

“Ancestral secret formula” is a phrase often heard in Chinese medicine intustry. People want to keep their “findings” themselves and then deliver products or services based on that knowledge as efficiently and as broadly as possible. This behavior is so deeply engrained in the minds of most of Chinese people and many enterprises are organized and operate to accumulate and defend stocks of knowledge and to extract as much value from them as possible.As the world speeds up, stocks of knowledge depreciate at a faster rate. As one simple example, the rapid compression in product life cycles across many industries on a global scale. Even the most successful products fall by the wayside more quickly as new generations come through the pipeline faster and faster. To succeed now, we have to continually refresh our stocks of knowledge by participating in relevant flows of new knowledge.

Summary

In summary, Nanjing government’s effort in transformation the region’s economy structure in attracting diverse talents and also setting up collaborations globally have provided entrepreneurs in the region have accesses to obtain important advices from outside experts and help them to establish crucial strategic partnerships and networking, both internal and external, which enable them to share knowledge and profits from complementary competencies.

Many studies have indicated that the ability to generate innovative ideas is not merely a function of the mind, but also a function of behaviours. Certain behaviours are more likely to generate creative ideas. Networking with diverse group is one of the critical behaviours. A globally networked knowledge clusters and innovation networks, by its nature, have provided a

diverse environment favourable for fostering different perspectives and thus would provide a framework favorable to management innovation; the collaboration is not only focusing on the outcomes but also the *impact; i.e.,* the *impact* of the collaboration on company products, processes or people; how the new knowledge derived from the collaborationwould certainly contribute to a company's performance and creativity and thus stimulate the transformation of economy structure.