

Fostering Knowledge-based Industries by Gyeonggi Technopark (GTP); A Case Study

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Abstract

Technoparks(TP) in Korea were initiated in 1997 by the Ministry of Commerce, Industry & Energy (MOCIE) as five-year project. The main initiators along with the MOCIE for TPs' births were academia, local governments and industry. TPs were started with the mission of diminishing the problems occurred by pre-existing economic developments done for the past few decades. Initially, the 6 TPs including GTP were launched by the MOCIE. After their five-year projects, the MOCIE established ten more new TPs in other areas. Currently we have all 16 TPs in Korea. With government's decentralization policy, TPs have taken the position of the pivotal institutions for regional technology innovation.

While Gyeonggi Technopark(GTP) started with other first 6 TPs in 1997, it has been one of a few leading TPs and one of the most frequently mentioned benchmarking targets to show a Korean model of the RIS by both developing countries and new-born TPs in Korea.

GTP's mission is to lead on-going growth of the local economy, being a platform to accelerate technology innovation and its diffusion. For doing so, GTP has three goals: □ to make a cutting-edge technology industrial park for technology innovation, □ to upgrade the level of regional technologies, and □ to build a Regional Innovation System (RIS) by networking of different sectors. These three goals show a detailed business direction of how GTP could foster the knowledge-based industries at the local level. To accomplish the goals, GTP has carried out five core programs in the areas such as; □ R&D-based clustering □ R&D supports □ SME's business supports □ commercialization of new technologies and □ the RIS(Regional Innovation System).

GTP's 4 strategies are the driving force for its success. They are summarized as 4 initial Cs: Clustering, Commercialization, Coordination and Customizing.

Clustering activity is the first priority in terms of its strategic importance. GTP has continuously extended its space to entice national R&D centers and global companies. For example, GTP allowed the chosen R&D centers to build their own buildings in the cluster area with a good deal of excellent conditions for them. In that way, GTP enticed KTL(Korea Testing Laboratory), KITECH(Korea Institute of Industrial Technology), KERI(Korea Electrotechnology Research Institute), and SOI Korea(State Optical institute, Russia). Also GTP attracted the global company-based research centers such as LG Micron co., Ltd, & LG Innotech co., Ltd., etc with the similar conditions. GTP has been putting on-going efforts to entice excellent R&D sector in the area. These institutions play the role to lead the cutting-edge technology, and play a key role to transfer and/or disseminate their high technologies toward the small and med-sized enterprise within the region.

While GTP extended its physical space with-out to attract more R&D based insititutes (mentioned above), it has also expanded its clustering territory with-in. Eagerly participating in governments' projects, GTP attracted the MBC(Micro Biochip Center), GTP Bio Venture Center, and Robotics Research Service Center. Enticing JCI(Johnson Controls Automotive Korea), a global auto-parts co., is another way to create better automotive cluster environment in the park.

Though the roles of local governments and the universities have been great for clustering, major role has been played by GTP to create the landscape of the cluster. Owing to the strategies, GTP has 85 tenant ompanies and the space are fully occupied by them. The tenants' gross sales are 350 million dollars per year. More than 1,000 employees are working in the complex. At the beginning, only 44 companies and 340 employees. While 7 years have been passed, more than 200 companies have been successful in their businesses and settled down in other places after leaving GTP. With its reputation of technology oriented programs, GTP has been recognized as the harbinger of the regional technology innovation and creation of knowledge-based industries.

GTP has four internal and four external factors for its success. The internal ones are as follows; □ stable operation system, □ R&D oriented clustering scheme, □ closely working with the government's industrial policies, and □ good relationships with academia. The external factors of GTP's success are □ governments' innovation-oriented policies, □ localization mind for economical & industrial developments in the national

level, □ local governments' efforts for technology innovation, and □ regional SMEs' enthusiasm for technology innovation

Since its nature of the birth, GTP's journey for its mission has been very similar to other TP's in Korea. Not only on TP's starts, but also on their growing stages, the central government has used the same measuring stick in evaluating the outputs of them. After the 5 year fund raise was stopped in 2003, each TP was supposed to find its own best way to be accustomed to the feature of its neighboring environment. For instance, Gyongbuk TP has strengthened the power of technology innovation with university-oriented strategy; Daegu TP with the dispersion policy named 'π-plan'; and Songdo TP with the policy of Economy Liberty Zone designated by the central government.

Due to the central government's Localization policy (putting more resources to the region that does not belong to the capital-metro area), GTP has been alienated from the central government's support span, and tried to work more closely with the local governments to hold its superior industrial capacities and location advantages to boost up the regional economy. As a result, GTP has been finding its own unique ways to work with other sectors. For instance, GTP is evaluating all BI centers (forty-seven BIs) in Gyeonggi Province. GTP is more focusing on Post-BI SMEs. To create several small-sized clusters in Gyeonggi province, GTP launched the Mini TP Project. GTP established and enticed professional information centers such as ECRC (Electronic Commerce Resource Center), GTTC (Gyeonggi Technology Transfer Center), Ansan Software Center, and Gyeonggi Ansan Intellectual Property Center. They are working together to accentuate the commercialization of new technologies.

Though GTP is an example of the success, it is rather the time for GTP to be more concerned of the issues to resolve. First, as non-profit organization, GTP has not yet achieved financial independence. Second, the industrial environment has not been so great for Korean industries. The exodus of the companies to China is taking place everyday. The central government's localization policy has metro area companies move to other regions. The lack of original key technologies hinders us from moving on toward the knowledge-based industrial society. GTP believes the true success is not in a great operation system, but in capability of coping with these problems and providing proper solutions.

◆ The Knowledge-based World Economy

The knowledge-based society. It is today's keyword to explain how rapidly the world is transforming. More regions of the world are finding their way based on knowledge and information. Economists are now more interested in knowledge as a new factor for economic growth than any other traditional factors, such as human labors and natural resources. For years we were experiencing a new millennium, we came to recognize that a new growth force had been coming forward indicating a new direction for our society. The key word is "knowledge". The creation of knowledge and on-going technological innovation have made the territories of the "region" broader and wider. It also became one of the key factors for national competitiveness. Knowledge is now understood as the focal ingredient of economic growth. Therefore, its roles, effects and the best examples of using it have been the main objects of researches in many nations.

Due to concerns about the new era of knowledge based economy, each country has obtained its competitiveness with diverse strategies and programs to meet the current trend of new challenges. Out of many different approaches, the world became more interested in the role of local innovation based on technology competitiveness. Out of many trials to make things work, it has been reported that more countries have accomplished better results with running cutting-edge industrial parks. Among many researchers, industrial parks are told to play a key role in technology innovation since the 70's. Also more people tried to connect its success with the NIS (Nation Innovation System).

◆ Decades' Trials Done by Korea

In the 60's, Korea started to industrialize the state with its unique economic development strategies. As a part of the national development plans, the central government established the Hongnung Machinery Research Complex in the 60's, and Daeduk Research Complex and Gwangju Hi-tech Industrial Complex in the mid 70's. Though these industrial complexes made some positive effects on the outer growth of the economic development, it has been told that they could not play a crucial role in setting up the regional innovation system. They eventually could not play a stepping stone to upgrade the regional economy in the mid-long term vision.

In the 80's, a new trial was done in Changwon, Chuncheon, and Osong areas to establish science research complexes. They were another example initiated by local governments. However, to be

disappointed, the project did not turned out to be successful enough, and later it head the initial plan changed or smaller in its size. It is not only because the social and economic conditions were not mature enough, but also because there wasn't any mechanism through which R&D could have directly worked for the production and commercialization of the materials. Another reason for no success on the industrial complexes was that the project was more focusing on building physical infrastructures rather than filling them with good contents. So, the complexes looked like simple accumulation of hard wares. There is one huge difference between the industrial complexes which Korea had tried before, and the concept "cluster" which consists of networking and mutual learning system within a community.

Along with Korea's new political atmosphere(local governments' autonomy started off) and world trends of industrial development, technoparks were born as a new alternative project to establish a regional innovation system in local areas. Technopark projects were a tool for networking and technology innovation system. In December 1995, the government announced an industrial act, '5 Year Plan for Increasing Technology Infrastructure', and decided to start the 'Technopark Project'. Soon after many local governments and universities applied for the positions of each region's operator for technopark.

◆ Outline of Korean Technoparks

Technoparks (hereafter, TP) were started in 1997 by the Ministry of Commerce, Industry & Energy (MOCIE), as a five-year project. The main initiators for TPs' births along with the MOCIE were academia, regional governments and industry. TPs were born with the mission of diminishing the

<TPs in Korea>

TP (Location)	Established Year	Attendants	Space	Specialized fields
Gyeonggi TP (Gyeonggi Province)	1998	Gyeonggi Province, Ansan City 6 Universities	200,000m ²	Bio, Robot Electronic&information Automobile parts
Gangwon TP (Gangwon Province)	2003	Gangwon Province 3 Cities 12 Universities 8 Company	132,000m ²	Bio Medical Instrument Oceanic Life Advanced Materials
Gyeongnam TP (Gyeongnam Province)	2000	Gyeongnam Province 4 Local government 2 Research Institutions 16 companies	72,600m ²	Mechatronics Space and Aircraft Components Precisive Machinery
Gyeongbuk TP (Gyeongbuk Province)	1998	Gyeongbuk Province Gyeonsan City Gyeonsan CCI 5 Universities	138,600m ²	Machinery Electronic&information fiber, Bio Advanced Materials
Gwangju TP Gwangju Metropolitan City	1998	Gwangju Metropolitan City Jeonnam Province 8 University, GIST	100,000m ²	Optical Electronic&information Fine Chemistry
Daegu TP Daegu Metropolitan City	1998	Daegu Metropolitan City 3 Universities	118,800m ²	IT, BT, NT Mechatronics
Busan TP Busan Metropolitan City	1999	Busan Metropolitan City 12 Universities 21 Companies	118,800m ²	Harbors physical distribution software Auto components, etc.
Songdo TP Incheon Metropolitan City	1998	Incheon Metropolitan City 2 Universities KiTECH	452,100m ²	Electronic&information Mechatronics, Bio Advanced Materials
Ulsan Industry Promotion TP Ulsan Metropolitan City	2004	Ulsan Metropolitan City 2 Universities 4 Companies	100,000m ²	Auto, Fine Chemistry Shipbuilding Environment
Jeonnam TP Jeonnam Province	2003	Jeonnam Province 3 Cities, SGCCI 6 Universities	66,000m ²	Electronic&information components
Jeonbuk TP Jeonbuk Province	2003	Jeonbuk Province Jeonju City 7 Universities Hyundai Motors, etc.	66,000m ²	Auto Components Food Science Semiconductor Tradition Oriental Medicine

Chungnam TP Chungnam Province	1998	Chungnam Province 2 cities 12 Universities	200,000m ²	Semiconductor Display Media
Chungbuk TP Chungbuk Province	2004	Chungbuk Province 4 cities 3 Universities	254,100m ²	BT, IT, BIT
Pohang TP (Gyeongbuk Province)	2000	Gyeongbuk Province Pohang City 4 Universities 18 companies	138,600m ²	Electronic&information Advanced Materials Environment & Energy
Gyeonggi Daejin TP (Gyeonggi Province)	2004	Gyeonggi Province Pocheon City 4 Universities	100,000m ²	Furniture design Leather industry Environment & Energy
Seoul TP Seoul Metropolitan City	2005	Seoul Metropolitan City 11 Universities 10 companies	88,214m ²	NT, IT Microsystem Packaging

problems caused by economic developments done for the past few decades. At first, six places were chosen to operate the TP project. GTP was one of them. After the five-year projects, the MOCIE established 10 more new TPs in other areas since the outcome of running TPs was great. Currently we have all 16 TPs in Korea. With the government's decentralization policy, TPs have been the core pivotal institutions to lead regional technology innovation. The central government enacted a special aid law for TPs in 1998 and supported TPs in multi-dimensional ways. One of the special supports by the government is giving additional points of benefits to TPs when TPs apply for participating in the government's projects. The central government also helped TPs to organize its own association where the entire 16 TPs have joined to work together.

Objectives and Main Activities of GTP

Since Gyeonggi Technopark (GTP) started in 1997 as one of the first six TPs, it has been one of a few leading TPs in Korea. It became one of the most frequently mentioned benchmarking targets to show a Korean role model of the RIS by both developing countries and new-born TPs in Korea. GTP's mission is to lead on-going growth of the local economy, being a platform to accelerate technology innovation and its diffusion. For doing so, GTP has three goals:

1. to make a cutting-edge technology industrial park for technology innovation
2. to upgrade the level of regional technologies, and
3. to build a Regional Innovation System (RIS) by networking of different sectors.

These three goals show a detailed business direction of how GTP could foster the knowledge-based industries at the local level as follows;

First, the park shape matters. The physical looks of the parks tell how the parks are designed to work for its original objectives. In the case of GTP, it has 'Park Type' shape, which is based on land and facilities. The Park Type is different from other types, such as 'Innovation Center Type' and 'Network Type'. The Innovation Center Type has multi-functions within a building. The network type has one main building along with several others located nearby to carry out differentiated functions. Those types have their own shortcomings and strong points, and GTP chooses 'Park Type' considering the characteristics of the location. 'Park Type' is useful to enlarge the synergy effects of technology innovation by enticing the prospective companies and research centers from both overseas and domestic regions. It contributes to revitalize the local economy by acquiring the visual attraction in a short period. This means that one of GTP's main roles is enticing the prospective global companies and research centers to the park to earn a regional competitiveness. It also means that GTP recognizes the importance of fostering knowledge-based industries.

Second, to upgrade the levels of regional technologies, GTP prioritizes the systemization of infrastructure upon which R&D and technology commercialization could take place in a short time span. Though the companies in the national or local industrial complexes have had R&D capabilities, the amount of their funds and endeavors were too small, comparing to their total sales amount. It means that SME's are more likely to produce their products under OEM contracts and/or to work as

subcontractors under the Chaebol (a financial clique) economy system rather than to have their own independent technology administrations. TP has also emphasized the commercialization of new technologies developed at universities and/or research labs. The potential tenant companies of GTP now apply for their business space with the business plans, including R&D schedules. To support tenant companies' R&D capabilities, GTP operates programs and personnel in the areas of technology transfer, technology commercialization and intellectual property.

Finally, GTP's third goal, upgrading the level of regional technologies and building Regional Innovation System (RIS) is aimed at making an excellent circumstance where technology innovation continues in spite of the limited resources. In short, the main stream works of GTP is gathering resources such as facilities, research equipment, human resources, finance, and technology-related information into a single place(both on-line and off-line), and setting up the 'one stop multi-service system' under which any company could use the gathered recourses at its convenience. Since it is impossible for GTP alone to satisfy all of the companies' needs, the strategy of GTP is networking with other sectors and connecting with other support institutions. The networking system has been developed This is an effective method to escape overlapping and to make synergy effects in business. The business model of GTP with its 3 goals remains one of the most popular and universal.

Industrial Circumstance surrounding GTP

There are about 34,000 manufacturing firms (about 30% of 110,000firms) and 2,990 venture firms (about 29% of 10,400 firms) in Gyeonggi Province. The province is located in the heart of Korea, having played a central role of boosting up Korean industry for several decades. Main streams of high tech in Gyeonggi are semi-conductors, electronic & information technology, mechatronics, bio, auto parts, and etc. The investment amount of R&D fund is more than 8 billion dollars per year. It is three times more than of Seoul, the capital city of Korea. It is mainly because major big companies' such as Samsung, LG Philips, etc, are located in Gyeonggi Province. There are more than 7,000 SMEs in the Banwol and Shiwha National Industrial Complexes, and 170,000 people are working for them. The annual output is up to \$42 billion dollars (export \$6.7 billion). However, most of the companies are subcontracted to big companies and produce the ordered items only. With this reason, most of the companies have little experience at R&D and marketing, and it ends up hindering their growth.

| Ansan and its Vicinities |



- 9 Universities and Colleges within 50 miles
- Incheon Airport within an hour driving
- Pyeong-taekPort within an hour driving
- 2 National level Industrial Complexes (7,000 SMEs)
- Guro Digital Industrial Complex (Seoul) within 20 min's driving
- Excellent Human Resources

| A Map of Gyeonggi Province |



- Central Gov.'s plan for Gyeonggi : Mecca for high-tech, knowledge-based Industry in Korea
- 3 Focal Clusters : Ansan (B/S), Suwon (SamSung), Paju (LG Philips)
- Co-related industry clusters in Gyeonggi Prov.



The mission of GTP is, first of all, to construct the most adapted business environment for the regional SMEs, and to set the networking system where academia, government and industry work together so that the companies could grow into a world competitive companies with the ability of technological competitiveness.

Principal Support Programs

GTP has carried out five core programs in the areas such as; □ R&D-based clustering □ R&D supports □ SME's business supports □ commercialization of new technologies and □ the RIS(Regional Innovation System).

◆ The Construction of Industrial Technology Park

Clustering is the first priority in terms of its strategical importance. Size wise, GTP expanded its space from 100,000m² to 200,000m² within 5 years. For the additional space, GTP allowed the R&D sectors to build their own buildings with the condition of 20 year free usage. In that way, GTP enticed KTL (Korea Testing Laboratory), KITECH (Korea Institute of Industrial Technology), KERI (Korea Electrotechnology Research Institute), and SOI Korea (State Optical institute, Russia). Also, GTP attracted the global companies, research centers such as LG Micron co., Ltd, & LG Innotech co., Ltd., etc. GTP has been putting on-going efforts into enticing world-famous R&D centers in the area. These institutions play a role in leading the cutting-edge technology, and GTP expects that the R&D sector could transfer and/or disseminate their high technologies toward the SMEs within the region.

While extending its physical space outwardly to attract more R&D based institutes (mentioned above), GTP has also expanded its clustering territory with-in. As eagerly participating in governments' projects, GTP attracted the MBC(Micro Biochip Center), GTP Bio Venture Center, and Robotics Research Service Center. Enticing JCI(Johnson Controls Automotive Korea), a global auto-part co., is another way to create better automotive cluster environment in the park.

| A Technopolis Created in the City of Ansan |



<http://www.gtp.or.kr>

<Gyeonggi Technopolis Bird's eye view>

◆ **Construction for the R&D Infrastructure**

This is a support program to provide the R&D infrastructure that companies could use anytime they want. GTP has invested more than \$25 million to the SMEs so far. The open lab is one example. GTP's open lab provides 46 pieces of equipment for public use which costed 5 million dollars. GTP has made the database on the website for human resources and R&D equipments. In a similar way, GTP provides on-line consulting for technology and on-line education while collecting, processing and distributing the information of new technology and products. Another way of processing and disseminating information has been supplied by diverse information support programs; GIDC(Gyeonggi Internet Data Center) for basic IT-related information, ECRC for e-business, and Ansan Software Center for upgrading the technology level of SMEs' with IT application. These R&D infrastructures and supporting systems using IT are core activities to foster cutting-edge technology and knowledge-based industries. GTP has widened the coverage of activity through networking academia, industry and government.

◆ **Management and Marketing Development Program**

When SMEs need to accelerate their scales of business activities, they definitely need the detailed information and knowledge about finance, marketing and management. To support them, GTP has provided services to enhance their business administration capabilities; for example, hosting the Ansan New-tech Industrial Exhibitions, exploring overseas marketing, operating show rooms, hosting the Design Contest, and international certification support have been arranged by GTP for several years. As global marketing environments are changed so rapidly, GTP runs the classes for CEOs to enhance their skills for business administration and decision-making. Also there are more specializing education programs such as Outplacement Start-up education and seminars for technology protection.

◆ **Technology Transfer and Intellectual Property**

Commercialization of newly developed technology is as important as the technology itself. Any good technology is supposed to melt down into a product. With the stress of commercialization, the technology evaluation, transfer, and the acquirement of the intellectual property became the main issues of boosting up hi-tech industries. To do these, GTP operates GTTC(the Gyeonggi Technology Transfer Center) and GIPC(the Gyeonggi Intellectual Property Center). The programs in the centers are executed under the central governments' concerns and GTP has taken the portion of Gyeonggi Province. Established in 2003, GTTC has accomplished many things, such as excavation of the cutting-edge technology, surveys on technology demands, technology marketing, consulting on technology transfer and constructing technology transfer networks, etc. Established in 2004, GIPC supports SMEs with information of intellectual property and registration know-how. The center was initiated by the Industrial Property Office and GTP took the right to cover the region of Gyeonggi area.

◆ **Setting up the RIS**

There are 48 Business Incubators in Gyeonggi Province. GTP plays a central role for their activities. GTP evaluates their accomplishments annually and organizes the networks among them. GTP is also operating the 'Gyeonggi Technology Innovation Council', where many innovation leaders gather together to discuss the issues of regional industries and to draw new industrial policies to be applied. The Mini TP Project is another networking project, dividing regional industrial fields into 5 areas: Mobile MiniTP, Bio/pharmacy MiniTP, Digital/Media MiniTP, Nano material MiniTP, and Eco MiniTP.

In addition, GTP has diverse fellowship programs to encourage innovative leaders to easily access new information on technologies and industrial policies. 'Inno-Café' is a space for casual meetings of these leaders, providing space itself, internet access, copiers, magazines of industrial policy, technology road maps and many other associated articles. GTP also tries to create a more positive mood of technology innovation, discovering the best practices of collaborative works among academia and industry, and holding workshops in order to diffuse it.

Strategies

GTP's 4 strategies are the driving force for its success. They are summarized as the 4 initial Cs: Clustering, Commercialization, Coordination and Customizing.

◆ Clustering

Space expansion and gathering the research institutions and companies into a single spot are not sufficient to make a good cluster since it is just simple gathering of the different sectors. GTP organizes networking and mutual learning system, making many working groups in the cluster. GTP plays a central role of system organizer; universities and local governments play a role of vision provider; and large enterprises, national research institutions and service providers play a role of specialized supplier.

◆ Commercialization

Commercialization of new technology has been emphasized these days, and it is GTP's preferential strategy. Today, the speed of the technology innovation is faster than ever, and the life cycle of the technology is shorter than ever. In short, timing truly matters in today's technology world, any developed technology should be commercialized on time. For faster commercialization process, GTP has provided diverse programs on getting intellectual property rights, supported to develop additional technology for production, and presented new business models for marketing.

◆ Coordination among the academia, industry and government

The cooperation among the academia, industry and government is told to be a key factor. However there is a basic premise of why they are gathering. The participants within the cooperative circle work only according to their interests. It means that without incentives the participants won't work together nor accept the government policies. GTP has tried to give both tangible and intangible incentives to the participants, while collecting their opinions and suggesting their alternative ideas to the governments. The goal of GTP's networking efforts is to be the hub of the region and as system organizer to help innovation leaders to play their roles for the RIS in the region.

◆ Customizing

Responding on the needs of the companies is another important business to GTP. Though their needs are diverse and they are fluctuated based on the time and environments. GTP had tried to respond their needs and to establish partnerships based on the mutual trust. GTP periodically examines the demands of companies on the areas of technologies, equipments, fund, and education. In addition, GTP often audits the discontent and difficulty through the customer satisfaction monitoring.

Fostering the Knowledge-based Industry

GTP's infrastructure and support program have contributed to foster knowledge-based companies. As a result, the city of Ansan, where GTP is located, won the prize of 'the best city for SMEs doing business' last year. Banwol and Shiwha National Industrial Complexes were also positively influenced

by GTP. The number of med to large-sized self-sustaining enterprises (more than 100 million dollars in sales a year) has increased from 24 in 2003 to 60 in 2005, and it is expected to be 100 in 2008.

Though local government and the universities helped in many ways, the main actor of making the landscape of the cluster is GTP. The space of GTP for incubating is currently full with 85 tenants. The tenants' gross sales are total 350 million dollars per year. More than 1,000 employees are working in the complex. GTP started off with only 44 companies and 340 employees. While 7 years have passed, more than 200 companies have successfully done their businesses and transferred to settle down in other places. With its reputation of technology oriented programs, GTP has been recognized as the harbinger of the regional technology innovation and creation of knowledge-based industries.

To foster the cutting-edge industry which has a regional ground, GTP chose 4 industrial fields to support; IT, auto parts, bio, and robot. Major SMEs in the region are of the field of IT and auto parts. Bio and robot are future technologies to lead the cutting-edge industry. Many sub-institutions of GTP such as MBC (Micro Biochip Center), GTP Bio Venture Center, Robotics Research Service Center, ECRC, and Ansan Software Center are producing services to foster the 4 industrial fields

Factors for GTP's Success

GTP has four internal and four external factors for its success. The internal ones are summarized as follows; □ stable operation system, □ R&D oriented clustering scheme, □ closely working with the government's industrial policies, and □ good relationships with academia.

◆ Attaining a Secure Governance System

Dr. Bae, president of GTP, has held the leadership from the initiating of GTP to present. This has made GTP's internal environment more consistent and the staff could perform the work with more focused minds. Also the stable organization management system contributes to GTP coping with the change of the external environment. In many cases, political changes affect the organization system of public institutions like TPs in negative ways, and cause some chaos or confusion within the organization. GTP has a relatively autonomous organization system to cope with it properly.

◆ R&D oriented clustering scheme

Compared to the other TP, GTP has geographical excellency good merits to entice companies and R&D centers all over the world. However, without any effort to make a great cluster in the region, GTP might have remained just one of the BI centers. Cooperation with the local governments and universities have also worked well. Excellent human resources are another strong point of GTP. Currently, about 2,000 Ph. D researchers work in the cluster and approximately 3,000 Ph. Ds will be working when the second phase of cluster plan is finished in 2008.

◆ Closely working with the government's industrial policies

The government policy and system is crucial to the development and growth of SMEs. The will power and strong spirit of local governments also affect the development of the local industry directly or indirectly. With the support of the governments, GTP has functioned as a policy executor and become the stronghold for the technology innovation in the region.

◆ Good Relationships with Academia

Working with academia is one of the most important factors from the beginning of TPs. The successful cases of the advanced technoparks around the world showed that the research capabilities and the equipments were the primary factors in the cooperation of academia, industry and government. However, many people failed to notice the difference between universities in Korea and those in Europe or America. The environment where universities could cooperate with the industry has not ripened yet, and also there are little incentives for the universities. GTP chose a more realistic strategy

in making relationships with universities. At the beginning, professors participated in working for GTP as part-time staff until the organization became strong enough. Also, the resources that GTP had to obtain from universities are not financial support but technologies and R&D capabilities. In this way, GTP was trying to find the best way of collaborative works with universities. GTP has also made diverse cooperation programs where universities could interestingly attend.

The external factors of GTP's success are □ governments' innovation-oriented policies, □ localization mind for economic & industrial developments in the national level, □ local governments' efforts for technology innovation, and □ regional SMEs' enthusiasm for technology innovation

There's no need to offer an extra explanation about the external factors. Current government has spent a tremendous amount of the budget for R&D investment (e.g. 8.9 billion dollars for R&D investment this year) and for developing the 10 Next Generation Growth Driving Forces. After the venture bubble disappeared in the 90s, companies with technological competitiveness came back to the front line of the new industrial culture. It could give GTP other excellent chances to expand the boundaries of its business coverage.

Universality and Uniqueness

Due to similar birth stories among TPs, GTP's journey for its mission has been very similar to other TP's in Korea. Not only on the stage of TP's start, but also on their growing stages, the central government has used the same measuring stick in evaluating the outputs of all. But contrasted to other TPs, GTP put more efforts to make a technology innovation cluster (Gyeonggi Technopolis) in order to maximize the synergy effect within the area. And GTP has a close relationship with local governments to make financial resources. Due to the central government's Localization Policy (putting more resources to the region that does not belong to the capital-metro area), GTP has been alienated from the central government's support span, and tried to more closely work with the local governments to hold its superior industrial capacities and location advantages to boost up the regional economy. The other side, GTP has focused on the commercialization of the R&D results through the many support centers that established by GTP and central and/or local government.

As we see from the above, Korean TPs have double layered aspects: universality and uniqueness. Though starting with the same programs, TPs will try to be customize themselves to fit with their unique needs from the regions and the portion of the universalities will be smaller in the future. However, the universalities have prevailed so far and the history of Korean TPs is still very short. When compared with other technoparks around the world, we can easily figure out that Korean TPs still have more common grounds each other, which are different from other technoparks in European and Asian countries. Followings are the reason why;

First, the diversities of each Korean TP are limited under the guidelines of the central government. It is because Korean TPs were established by the central government and regulated by the law, which was made by central government. Though local governments and universities affect the shaping of TPs, the major framework for TPs was still done by the central government and its law.

Second, different from other technoparks in other countries, the business target of TPs in Korea includes all the companies located in their administrative districts. So, it is not particularly important that how many tenants are in the complex or how much the gross sales of the park are for a year. While technoparks in other countries were operated comparatively small numbers of staff mainly concerning the management of tenant companies, TPs in Korea have more staff to run many other programs, covering companies of the entire administrative district.

Third, different from other countries' cases, academia has a weak initiative to do cooperative jobs with industry. Though it is better than the past, it is not matured enough for academia to take initiatives to lead their own program of collaboration, and also, insufficient portions of incentives are another non-motivative factor.

Long Term Visions

Peter Ferdinand Drucker once said that in the knowledge society, the main cause to create wealth is not the capital distribution nor labor input, but the process of how the knowledge is distributed and applied. Recognized by many CEOs in the current industrial world, the importance of 'Knowledge Management' has been continuously applied and practiced.

Business operation systems of GTP need to be changed from simply constructing a infrastructure to be more focused on the diffusion of knowledge using information and telecommunication technology. GTP also has to induce the knowledge management system in operating the organization, and to put effort to upbringing the experts who will lead the knowledge and information society. In terms of the size, the cluster needs to expand to operate the RIS more effectively. Especially, setting business networks and revitalizing cooperation between academia and industry are GTP's facing issues.

In order for clusters to properly work, business networks for the companies are a must. To make it successful, it is necessary to connect the value chains of the functions on the horizontal line within the cluster, such as in the basic research, R&D, commercialization, production, marketing, selling and distribution. Especially, it is necessary to revitalize financial service market and to have functions for M&A and technology transfers.

Though GTP has had many outcomes, it is time for GTP to be more reserved for its evaluation. Instead, GTP is more concerned about some overcoming issues. First, as non-profit organization, GTP has not yet achieved financial independence. Second, the industrial environment has not been so great for Korean industries. The exodus of the companies to China is taking place everyday. The central government's localization policy makes metro area companies move to other regions. The lack of original key technologies hinders us from moving on toward the knowledge-based industrial society. GTP believes the true success is not in a great operation system, but in the capability of coping with these problems and providing proper solutions.

