This research focused on the strategy consulting of the ‘Gwanggyo & Pankyo Technovalley’ for the formation of the innovation clusters. The study was performed based on both theoretical study and related qualitative study approaches. Particularly, scenario planning as a foresight method was used for the strategy formulation of the innovation clusters. The major determinants for the success of the formation of the innovation clusters can be summarized as follows; the service of the hosting institution of clusters, the alignment of the national cluster policy and the networks of the clusters. In terms of the needs of times, this study regarding the strategy for the formation of the innovation clusters is anticipated to be a good reference for the R&D organizations and technology cluster participants in coming years.
1. Introduction

2. The Theoretical backgrounds of the Innovation Cluster
   - Concept of cluster and innovation cluster
   - Importance of Cluster policy
   - Evolution of the Cluster

3. Example of Innovation Cluster Management

4. The Strategy of the Innovation Cluster of Gyeonggi Province
   - Innovation cluster policy of Gyeonggi province
   - ‘Gwanggyo & Pangyo TechnoValley’ as an innovation cluster
   - Foresight of the innovation cluster as using a scenario planning method
   - Strategy of the innovation cluster for achieving a future vision

5. Summary
Introduction

- In this hyper-competition environments, many nations around the world try to formulate innovation cluster and manage it successfully as an infrastructure for the innovation.
- This paper studies the major determinants for the success of the innovation cluster using the qualitative study (case analysis method) of the innovation clusters.

- As a global R&D hub, the preferred future of the innovation cluster of the Gyeonggi province will be studied by using the "scenario planning".
- The strategy for achieving for the desired future of innovation cluster and the execution of the strategy will be also presented
  - Management of host institution

2. The Theoretical backgrounds of the Innovation Cluster
Concept of Cluster / Industrial Cluster

- Cluster: Organic networks, closely connected organizations
  - OECD (1999, 2001) defined clusters as a network of the independent firms, knowledge providers such as universities, research institutions, and customers.

- Industrial cluster is a network of firms, knowledge brokerage, service providers, and universities in a specific industry.
  - The participants of the industrial cluster compete and cooperate within the cluster.

Concept of the Innovation Cluster

- Innovation Cluster is somewhat different from the cluster (industrial cluster) in that its purpose is only for the (technological) innovation.
  - Innovation Cluster is an organic network in which all the participants (innovation nodes) are closed linked and within its embeddedness, innovation occurs spontaneously.
  - Science Parks, Techno Parks are the example of the innovation clusters.
  - All the innovation process, from idea to technological commercialization, can be occurred within the innovation clusters.

Source: Young Ja Bae, Wi Jin Song, Deok Soon Yim (2002)
Component of the Innovation Cluster

- Innovation Cluster comprises of ……………….. (1) (2)
  - Innovation nodes (firm, university, research institute) and its network and relationship
  - Innovation Input (support, personnel, information)
  - Innovation Process (input, process, output)
  - Interaction of the innovation nodes
  - Innovation Culture (Individually, Collectively)
  - Hardware Infrastructure etc…..

Evolution of the Innovation Cluster

- At the expansion cluster stage, the expansion of the innovation cluster are very fast.
  - Innovation supports such as the fund, human resources, consulting for technology commercialization are important for the innovation cluster
- Management of the innovation clusters at all levels is important for success
3. Example of Innovation Cluster Management

In this hyper-competition environments, many nations around the world try to formulate and manage innovation cluster successfully as an infrastructure for the innovation.

<table>
<thead>
<tr>
<th>Cluster Name</th>
<th>Summary</th>
<th>Hosting Institution</th>
</tr>
</thead>
</table>
| Tsukuba (Japan) | • 330 organizations (research institution, firms etc)  
• Academia-Research / Regional government Cooperation | Tsukuba Corporation Host institution |
| Olu (Finland) | • Nokia, IBM (high-tech firms), University, Research Institution  
• Best Model in 65 innovation clusters in Scandinavia | Since 1982, host institution has been running Management of H/W and S/W |
| RTP (US) | • Benchmarking model of the Korea Doeduck Innopolls | Research Triangle Foundation and Partnership Dual Management |
Success factors for the innovation cluster

- Management of the innovation clusters at all levels is important for success
- Innovation service support (Software aspect) is necessary for technology development and technology commercialization in addition to construction of the infrastructure of the innovation cluster (Hardware Aspect)

4. The Strategy of the Innovation Cluster
Regional Innovation System

STI Policy Governance of Gyeonggi province

- Regional Government (Province, City) vs. Central Government
- Innovation Actors (Industry, University, Research Institute)
- Branches of Central government supported research institute
- Gyeonggi Institute of Science and Technology Promotion (GSTEP)
- Gwanggyo Technovalley, Pangyo Technovalley, Ansan Science Valley
**STI Policy Direction**

**From Hardware Oriented to Software Oriented**

- **STI infrastructure**
  - Gwanggyo Technovalley
  - Pangyo Technovalley
  - Ansan Science Valley

- **R&D budget support**
  - Planning, management, evaluation
  - Analysis of the R&D investment

- **Innovation Networks**
  - IICC (Industry Cluster Innovation Committee)

**Innovation Network and Organization**

- Industry Innovation Cluster Committee (IICC)
- Gyeonggi Region Research Center (GRRC)
- Regional Innovation Center (RIC)
- Small Science & Technology Parks (STP)
### Gwanggyo Technovalley

<table>
<thead>
<tr>
<th>Location</th>
<th>Yeongtong-gu, Suwon, Gyeonggi Province, Korea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>5 main centers / building site: 269,404 m² / Land: 221,532 m²</td>
</tr>
<tr>
<td>Construction Period</td>
<td>Jun. 2004 ~ Feb. 2008 (3 years and 9 months)</td>
</tr>
<tr>
<td>Total Building Cost</td>
<td>$571.5 mill. (1$=1,000 Krw)</td>
</tr>
<tr>
<td>Company</td>
<td>About 200 companies</td>
</tr>
<tr>
<td>Main Goal</td>
<td>Convergence of technologies (IT, BT, NT)</td>
</tr>
<tr>
<td></td>
<td>Development of technology and commercialization</td>
</tr>
<tr>
<td></td>
<td>Development of human resource on science and technology</td>
</tr>
</tbody>
</table>

(9) [http://www.ggtv.or.kr](http://www.ggtv.or.kr)
Gwanggyo Technovalley

- Local government driven innovation cluster
  - In an effort to develop Gwanggyo Region into a science technology based innovation cluster, the Gyeonggi provincial government has initiated to foster Gwanggyo Techno Valley.

- Main centers
  - Gyeonggi Institute of Science and Technology Promotion (GSTEP) : 2010
  - Gyeonggi Small&Medium Business Center (GSBC) : 2002
  - Gyeonggi R&D Center : Apr. 2007
  - Korea Advanced Nano Fab Center (KANC) : Apr. 2006
  - Gyeonggi Bio-Center (GGBC) : Feb. 2007
  - Advanced Institute of Convergence Technology (AICT) : Feb. 2008

(9) http://www.ggtv.or.kr

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Gwanggyo Technovalley

- Gyeonggi Small&Medium Business Center (GSBC)
  - Supporting businesses in Gyeonggi Province to build global competitiveness and make inroads into the world
- Gyeonggi R&D Center
  - Key supporter for startup businesses and corporate growth
- Korea Advanced Nano Fab Center (KANC)
  - Leading breakthroughs in high-value semiconductor production technology by developing compound-centric non-silicone nano devices
- Gyeonggi Bio-Center (GGBC)
  - Offering networking services for business, academics and research organizations relating to bio science and industry
- Advanced Institute of Convergence Technology (AICT)
  - Providing the focal point of convergence technology development and producing competitive human resources for the high-tech industries

(9) http://www.ggtv.or.kr
‘Pangyo Technovalley’ as an innovation cluster

Pangyo Technovalley

◆ The Gyeonggi Province is the core area of Korea not only in terms of population, politics and culture but also in manufacturing and industrial technologies. All the major IT companies and auto makers are headquartered in Gyeonggi Province. Recently, it has started to invest at science and technology in various areas to enhance its technological competitiveness.

◆ The Pangyo Techno Valley development project is a huge Gyeonggi-do project to strengthen national competitiveness and the self-sufficiency of Pangyo New City through the establishment of a knowledge industry base for the development of national growth engines related to IT, BT, NT, CT and advanced convergence technology. It is a Gyeonggi-do strategic project to create a state-of-the-art technology complex. (8) (10)

(10) http://www.pangyotechnovalley.org
Vision of Pangyo Techno Valley

- As the center of advanced global technology, Pangyo Techno Valley will secure self-sufficiency for Pangyo New City and develop a specialized Global Cluster converging Research, Information and Technology.
- Its goal is to implement a trial model for ubiquitous technology and create a stage for state-of-the art technology and products from around the world (8) (10)

Location of Pangyo Techno Valley

- Pangyo TechnoValley has geographical benefits of being located within the huge consumer market of the capital region along with close proximity to adjacent clusters such as Gwangyo TechnoValley, AnSan Science Valley.
- This geographical advantage allows Pangyo TechnoValley to stand at the center of Korea's IT, BT, CT, NT and advanced convergence Technology Belt. (8) (10)
Residing Businesses

- Residing Businesses (8), (10)
  - 4T, 294 (’10.7)
  - Samsung TechWin, SK Chemical, Ann Lab, NHN etc.
  - High Tech Venture

<table>
<thead>
<tr>
<th>Total</th>
<th>IT</th>
<th>BT</th>
<th>CT</th>
<th>NT</th>
<th>etc</th>
</tr>
</thead>
<tbody>
<tr>
<td>294</td>
<td>177 (60%)</td>
<td>36 (13%)</td>
<td>35 (12%)</td>
<td>3 (1%)</td>
<td>41 (14%)</td>
</tr>
</tbody>
</table>

Innovation Support Centers (host institution)

- Global R&D Centers
- Industry-academia co-research centers
- Public R&D Support Centers (8), (10)
Scenario planning & Strategy formulation of the innovation cluster of the Gyeonggi province

- 2020 foresight (5), (8), (10)
  - Horizontal Axis: Network Capability with other clusters
  - Vertical Axis: Cluster Management Capability (hosting institution)

Preferred Future of the innovation cluster of the Gyeonggi province
5. Summary
Host Institution for Innovation
Cluster Management

Operational Strategy on Hardware

Community Space
Living Facilities
Transportation infrastructure
Thank You
<table>
<thead>
<tr>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) OECD(1999), Boosting Innovation: The Cluster Approach</td>
</tr>
<tr>
<td>(2) OECD(2001), Innovative Clusters : Driver's of National Innovation Systems</td>
</tr>
<tr>
<td>(5) Ron Jonston(2006), Scenario Planning, Strategic Foresight in Modern Management, Foresight Course, PREST, University of Manchester, 2006</td>
</tr>
<tr>
<td>(7) SRI International (1999), Clustering as a Tool for Regional Economic Competitiveness</td>
</tr>
<tr>
<td>(8) GSTEP(2010), Gyeonggi province and pangyotechonvalley Presentation Material</td>
</tr>
<tr>
<td>(9) <a href="http://www.ggtv.or.kr">http://www.ggtv.or.kr</a></td>
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