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11.THG MCP Thesis
MCP Thesis Proposal

Technopoles: From Mines and Foundries to Urban Neighborhoods

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Abstract

According to Castells and Hall (1994), technopoles represent the *mines* and the *foundries* of the information age. On the one hand, they are quarries for raw materials: fundamental technology and information. On the other, products based on those technologies are also conceived of, designed, and sometimes manufactured in the same centers. Since *Technopoles of the World* (Castells and Hall, 1994) was published, several technological transformations have impacted the urban landscape. Telecommunications infrastructure has become ubiquitous in most European and US urban centers. The availability of high-speed, digital voice and internet communications has impacted cities spatially (not always in significant or obvious ways), socially, and visually (increased digital media presence). More recently, technology is also being embedded in the city fabric creating a channel for location-based communications. How have these new technologies changed the notion of the technopole as the production centers of post-industrial society? What do widespread telecommunications networks and embedded technology imply for the urban form of technopoles at the neighborhood scale? In this thesis, a series of case studies is analyzed in light of more recent technological transformations to understand their impact on urban spatial configurations, live-work patterns and the evolving nature of urban communities faced with new technologies.
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Introduction

“The information they [high-technology products] embody has been created in technopoles, and invariably the embodiment of the information into the products also occurs in technopoles, which thus constitute the mines and foundries of the information age.”

In 1994, Castells and Hall published Technopoles of the World, in which they portray several cases in Europe, Asia, and the United States. The analysis focuses on changing modes of production and their impact on the type and context of industrial expansion in the information age. For Castells and Hall, technopoles represent both the mines and the foundries of post-industrial society. On the one hand, they are quarries for raw materials: fundamental technology and information. On the other, products based on those technologies are also conceived of, designed, and sometimes manufactured in those centers.

Since Technopoles of the World (Castells and Hall, 1994) was published, several technological transformations have impacted the urban landscape. Telecommunications infrastructure has become ubiquitous in most European and US urban centers. The availability of high-speed, digital voice and internet communications has impacted cities spatially (not always in significant or obvious ways), socially, and visually (increased digital media presence). More recently, technology is also being embedded in the city fabric creating a channel for location-based communications.

These two developments provide a very different context for post-industrial production than the one Castells and Hall were faced with in 1994. As a result, I believe that it would be valuable to revisit the technopole phenomenon and develop an updated set of case studies that indicates how post-industrial production may take place within a city that is suffused with technology. What do widespread telecommunications networks and embedded technology imply for the urban form of technopoles?

Research Question

What do widespread telecommunications networks and embedded technology imply for the urban form of technopoles at the neighborhood scale?

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Rationale

City governments and regional governments continue to promote programs for attracting high-tech firms to specific urban zones. According to the International Association of Science Parks,\(^2\) only 1% of their member science parks are located in non-urban areas. Many new clusters are modeled on rather generic office park designs that make some references to technology. In researching the case studies and questions proposed in this thesis, I aim to provide government officials with urban development guidelines for new technology clusters that reflect how new technologies can enhance high-tech production centers as urban places.

Urban Form and Technopoles in the 20\textsuperscript{th} Century

Technopoles are science parks or high-tech clusters\(^3\) that function like “spatial catalyst[s] promoting the formation of a flexible system of accumulation.”\(^4\) In other words, high value-added economic activities locate near each other and specialized services.\(^5\) Some of these dense clusters have developed spontaneously such as in Silicon Valley or Route 128 in Boston, Massachusetts. Others have been the result of strategic government intervention in land-use patterns. Sophia Antipolis on the Côte d’Azur in France developed from a very specific government-driven program to diversify the economy on the Riviera.\(^6\)

These research, development, and production areas generate a distinct urban spatial configuration that is captured in J.G. Ballard’s novel \textit{Super-Cannes}, which is set in a high-tech office park on the French Riviera:

\begin{quote}
…wealth at Eden-Olympia displayed the old-money discretion that the mercantile rich of the information age had decided to observe at the start of a new millennium. The glass and gun-metal office blocks were set well apart from each other, separated by artificial lakes and forested traffic islands where a latter-day Crusoe could have found comfortable refuge.\(^7\)

\end{quote}

New science park projects are often sited on the urban periphery or on undeveloped land within the city. Often government programs and incentives designate zones for these projects. Technopoles differ from one another in significant ways. They range in size from the smallest 20 ha, mid-small 20-60 ha, mid-big 60-100 ha, large greater than 100 ha.\(^8\) Some of the most well-known areas like Silicon Valley, USA Cambridge, United Kingdom or Sophia Antipolis, France cover very large areas (much greater than 100 ha). Varying degrees of government intervention have led to these developments.

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\(^2\) International Association of Science Parks (IASP), www.iaspworld.org

\(^3\) Technopole, science park, and high-tech cluster are used interchangeably throughout the text.


\(^5\) Thierry Bruhat, leading French technopole consultant.

\(^6\) Georges Benko.


\(^8\) International Association of Science Parks (IASP).
Scale and goals vary from site to site but technopoles have evolved from distinctly urban and economic development projects into multi-faceted systems for drawing creativity and innovation to a city or region. Experience makes the strongest case for coupling research-based institutions with high-technology firms to promote change. The model relates back to the historical development of Silicon Valley, which benefited significantly from the presence of Stanford University.

The evolution of technopoles can be traced in the history of Sophia-Antipolis, the “Silicon Valley of Europe.” A greenfield development between Cannes and Nice, Sophia-Antipolis was conceived to diversify the region’s tourist-based economy and become a model living and working environment. Under the guidance of a rigorous real-estate development strategy, well-known firms and respected educational institutions have clustered in the area. And Sophia-Antipolis continues to successfully attract newcomers but has been struggling to support those small firms so often associated with high-technology. Sprawling development (2,300 ha) and a lack of centers have also decreased the quality of life within the park9 even though strict land conservation has been successfully enforced (only one third of the land is built-up).

As in Sophia-Antipolis, technopole urban design and masterplan strategies rarely reflect the intensity of interaction necessary for sustaining and promoting the type of information spillover integral to triggering new ideas. Many technopoles are not connected to their surrounding urban fabric as they are constructed on distant greenfield sites. Land assembly in urbanized areas requires significant political and financial support both of which played an essential role in Sophia’s emergence.

Technology Transforming Urban Spaces

The spatial configuration of urban spaces has been impacted by three technological changes that have taken hold in the last ten years. First, telecommunications infrastructures have become more widespread and have increased in capacity. Second, embedded technologies are beginning to provide location-based services and information.

Telecommunications infrastructure provides access for rapid and high-capacity voice and digital communication and transmission of information. Between 1998 and 1993, 7.5 million miles of optical fiber cable have been deployed in US cities.10 More recently wireless communications have generated the potential for ubiquitous computing in a visible way.

Embedded technologies have provided the possibility for disbursing location-based content on-site. Some of these technologies imply that people communicate differently in certain urban zones through devices. In other cases, smart devices simply display relevant content according to the users in the urban space, time of day or other rules.

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9 Based on a discussion with park Director, Jacques Masboungi, Sophia lacks a true urban center where people gather. Sophia Antipolis, July 2003.
These two trends imply disbursal of information-based activity through the internet and the concentration of information in specific zones through location-based services. They have transformed the potential for configuring urban spaces for designers and urban planners. New opportunities for urban development should also impact how production centers are located in the city and new zones are developed. Technopoles could be among the first areas where these transformations in the city actually impact urban development patterns.

Methodology

I intend to analyze several cases based on the recent Seoul Digital Media City conference on October 23, 2003. The principal presentations were given by five cities that are trying to develop technopole/mediapole programs in existing and new zones: Cologne, Germany; Lower Manhattan, United States; Helsinki, Finland; Copenhagen, Denmark; Seoul, Digital Media City. In addition, one corporation, Samsung, presented its strategy for telecommunications in the future city. I have selected five cases studies. Four of the cases are urban development or redevelopment projects while the fifth case differs from the others by looking at a corporations proposals for the city of ubiquitous computing. The cases are subdivided into four categories which represent different manifestations of how technopole design is being rethought:

1. Redeveloping Existing Urban Areas: Lower Manhattan, United States
2. Content Creation and Distribution: Seoul, Digital Media City
3. Ubiquitous Computing: Samsung
4. Emerging High-Tech Neighborhoods: Copenhagen, Denmark or Helsinki, Finland and One North, Singapore

Chapter Outline

1. Introduction: Analysis of Castells and Hall
2. Widespread Telecommunications Infrastructure
3. Technologies for Diffusing Local Content in Urban Contexts
4. Case Studies
5. Strategies and Recommendations for Future Technopole Developments
## Preliminary Work Schedule

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<tr>
<th>Dates</th>
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<tr>
<td>5 January</td>
<td>Compiling information on technologies</td>
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<tr>
<td>12 January</td>
<td>Hone argument in reaction to Castells’ and Hall’s book</td>
<td>Manuel Castells’ Seminar</td>
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<tr>
<td>19 January</td>
<td>Continue research on technologies, Develop timeline for case study research</td>
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<tr>
<td>26 January</td>
<td>Continue research on technologies</td>
<td>Submit draft of section on relevant technologies.</td>
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<td>2 February</td>
<td>Research: Case Studies</td>
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<td>8 March</td>
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<td>Submit case studies to advisor and reader as completed</td>
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<td>15 March</td>
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<td>29 April</td>
<td>Research: Case Studies</td>
<td>Finalize case study write-ups</td>
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Bibliography

I will draw on materials from various fields for the purposes of introducing and analyzing the case studies listed above. The literature ranges from urban economics, planning, urban sociology, through architecture writing and texts on technology and society. Reports, newspapers, and websites will provide additional important materials especially for the case studies.

Technology and Societal Transformation


Technopoles


(I will also draw on the information collected throughout the MIT-Digital Media City initiative which includes significant amounts of additional information on specific technologies and other case studies around the world.)


International Association of Science Parks, http://www.iaspworld.org/

Pattinson, Marc. “How to Create a Favorable Environment for Technology and Innovation Parks in Urban Areas,” IASP World Conference on Science and Technology Parks, June 1-4 2003, Lisbon, Portugal.


Technologies

Digital Media City Project, MIT-Seoul, Korea, ongoing.


Methodology

