SPONTANEOUSLY-DEVELOPED INNER CITY TECHNOLOGY PRECINCTS: CASE OF İZMİR

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by
Gülnur VURUŞKAN

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We approve the thesis of **Gülnur VURUŞKAN**

_____

Assist. Prof. Dr. Koray Velibeyoğlu

Supervisor
Department of City and Regional Planning

_____

Prof. Dr. Cemal ARKON

Committee Member
Department of City and Regional Planning

_____

Assist. Prof. Dr. Erdem ERTEN

Committee Member
Department of Architecture

6 October 2010

_____   _____

Assist. Prof. Dr. Semahat ÖZDEMİR   **Assoc. Prof. Dr. Talat YALÇIN**
Head of the Department of   Dean of the Graduate School of
City and Regional Planning   Engineering and Sciences

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ABSTRACT

SPONTANEOUSLY-DEVELOPED INNER CITY TECHNOLOGY PRECINCTS: CASE OF İZMİR

At the end of 1990s, knowledge became the fourth factor of production beside: land, labor and capital. Knowledge sector as education, R&D, mass media, information technologies, and information services had a rapid entrance to our lives. Changing urban and economic trends effected evolution process of technological-development areas. Today, knowledge-intensive business and service sectors are accepted as the key players in knowledge-based development of cities. Suburban technological-development areas have slipped to dynamic and vibrant urban centers where the business and service sector actually performs, and historical, cultural or creative character ascends. New urban technology precincts aim to sustain the process of knowledge production, transfer and dissemination by gathering different networks in strategic levels. Some urban technology precincts have emerged spontaneously in certain parts of cities named as spontaneously-developed urban technology precincts. Those areas act as a living organism because of their self study formation. Therefore, it is difficult to understand their general spatial and organizational characteristics

The aim of the research is to clarify how spontaneously-developed technology precincts can be characterized. In this context, Çankaya-İzmir/Turkey was selected as case area. The area, was assessed within a system of indicators as governance, connectivity, clustering environment, talent and social environment, built environment, cultural and natural environment.

As a result, case area in Çankaya – İzmir / Turkey can be accepted as an emerging inner city technology precinct waiting for local authorities to develop. It can be managed as a powerful source of local economic development and supply cultural and social prestige of İzmir.

ÖZET

KENDİLİĞİNDEN GELİŞEN KENTİÇİ TEKNOLOJİ BÖLGELERİ: İZMİR ÖRNEĞİ

90'lı yılların sonlarına doğru bilgi olgusu; sermaye, çalışan ve arsa gibi üretim olgularının yanında yer almaya başlamıştır. Değişen kentsel ve ekonomik eğilimler, teknoloji geliştirme bölgelerinin gelişim süreçlerini de etkilemiştir. Bilgi sektörü eğitim, ar-ge, medya, bilişim teknolojileri ve servisleri günlük hayatımıza hızlı bir giriş yapmıştır. Günümüzde, bilgi temelli servis sektörü, şehirlerin bilgi temelli kentsel gelişiminde önemli bir rol oynamaktadır. Bu süreçte, yeni nesil teknoloji geliştirme alanları daha canlı ve dinamik kent merkezlerine yönelmişlerdir. Yeni teknoloji geliştirme bölgeleri bilgi üretiminin transferinin ve dağtımının sürdürülebilir bir sistemle geliştirilmesini amaçlamaktadır. Bu bölgelerden bazıları oluşum şekilleri nedeniyle kendiliğinden gelişen teknoloji bölgeleri olarak adlandırılmaktadır. Bu gibi alanların mekansal ve organizasyonel karakteri, işletim ve çalışma süreçleri göz önüne alındığında, geleneksel yaklaşımlardan farklılaşmaktadır.

Çalışmanın amacı kendiliğinden gelişen teknoloji bölgelerinin yapısını ortaya çıkarmaktır. Bu bağlamda, İzmir-Çankaya örneği çalışma alanı olarak belirlenmiştir. Bu alan, yönetim, erişim, kümelenme, yapılı çevre, sosyal yapı, kültürel ve doğal çevre gibi etmenler altında incelenmiştir.

Sonuç olarak, çalışma alanı, gelişime açık bir kent içi teknoloji bölgesi olarak nitelendirilebilir.Bu alan, yerel ekonomik kaynaklar ile güçlendirilerek kültürel ve sosyal alanda İzmir kimliğine katkıda bulunacaktır.

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ICT   Information and Communication Technologies

IT   Information Technologies

R&D   Research and Development

UTP: Urban Technology Precinct

SDUTP: Spontaneously-Developed Urban Technology Precinct

INTELI   Inteligência em Inovação, Lisbon – Portugal

MAKCI   The Most Admired Knowledge Cities

I-Hub   Innovation Hub

IASP   International Association of Science Parks

OECD   Organization for Economic Co-Operation and Development

DPT   T.R Prime Ministry State Planning Organization

IZKA   İzmir Development Agency

ITO   İzmir Chamber of Commerce

TUBIDER   IT Sector Association

TESID Turkish Electronics & Information Industries Association

TUBISAD   Informatics Industry Association

NGO   Non Governmental Organization

SME   Small and Medium Entrepreneurship

CHAPTER 1

INTRODUCTION

21st century cities are in the process of re-urbanization with the effect of increase ICTs result of innovation, creativity and flexibility in relation with the changing economic structure to knowledge economy. In this transformation process, conventional spatial and organizational structure of technology-development areas starts to be change. Intersection of urban technology, urban space and society & economy affects location choice, type, place of production and the product type of conventional technology areas. They turn to knowledge generation, transfer and absorption process by knowledge economy. Commercializing new knowledge cause increase in knowledge-based business and service sector and awareness of centrality to urban to sustain face-to-face contact, and especially quality of life in the vibrant, dynamic city. This process brings knowledge based innovative environments that contain new technology development areas with new contents. Those new technology developments that locate inner city are named as urban technology precincts (UTPs). UTPs appear in two ways. First way contains a renovation and rebuilt process of old or abandoned industrial grey or brown fields in urban to new technology-based, vibrant, identical, branding areas. Second way is a spontaneously appearance that occurs by accumulation of ICT based service and business sectors in a definite urban part. These spontaneously-developed areas have unique opportunities to create local urban technology precincts for entrepreneurships. They are existing small accumulated ICT based areas waiting to be identical, branding, known urban technology precinct by small interventions with fewer budgets.

In literature, it is easy to find general information about spatial and organizational characters of conventional technology development areas or current time purposefully designed contemporary urban technology precincts. On the other hand, there is a gap for spontaneously-developed inner-city technology precincts. The study aims to define general spatial and organizational characters of spontaneously-developed urban technology precincts (SDUTP).

The study handles a possible case area in İzmir/Turkey which has potential SDUTPs. In this process; study deals with three research questions:

1. What is main spatial and organizational character of spontaneously-developed inner city urban technology precincts?
2. What are the aspects of technology precinct's design or fine tuning?
3. What are the possible elements to improve "İzmir Technology Diamond" in terms of spontaneously-developed urban technology precinct concept?

1.1. Research Background

The term "Precinct" is actually an urban phenomenon. In urban planning and design literature the term ''precinct'' is defined as an urban area with a distinctive character comprising its internal closure and mobility (i.e. recreation precinct, residential precinct, education precinct, entertainment precinct) (Cullen, 1971). On the other hand, Lynch (1960) describes an urban ''district'' as similar to the precinct, mainly referring to a medium-to-large section of the city with perceived internal homogeneity and distinguished by some identity or character.

In this study, the concept of "Technology Precinct" is rather place-centered and refers to a distinct part of a city with a recognizable identity to which knowledge gives its unique character. In this sense, the urban technology precinct can be regarded as the place of different types of knowledge-based areas in which geographic scale are not pre-determined and may be local or national/international – or both depending on the industry and its global construction.

Today certain cities have begun to act as communities of knowledge, innovation, creativity and learning, becoming more dynamic, complex, diverse, open and intangible and they are defined as knowledge cities (Carillo, 2004; Ergazakis et al., 2004; Van den Berg et al., 2004), creative cities (Landry, 2000; Florida, 2005), information societies and so on. Such a classification of cities and regions occur according to their capacity of becoming innovation environments and usage of knowledge (Finquelievich, 2002).

In relation with this, conventional concept of technology development areas began to change in terms of new technology precincts where knowledge is the driving force of the economic and urban development (Drucker, 1994) in relation with innovation and creativity.

In literature technology development area's beginning point is accepted as the idea of concentrating companies in one single area with the first industrial park/district; the Central Manufacturing District in Chicago created in 1905. (Castells, 1994; Seitinger, 2004; Annerstedt, 2006). Then it continues with science parks which first appeared at 1950 by Menlo Park and Stanford Science Park in Chicago. Conventional technology development areas have been classified under various names as technopoles/technopolis, research parks, business parks, technology centers; but the generic umbrella has been accepted as "Science Park" (Vanhoudt, 2006; Seitinger, 2004; Pages et al., 2008) which tend to provide the opportunity for a degree of institutional co-operation between university and industry, besides being producers of high-technology products and services. In relation to the changes of urban and economic structure, technology developments are classified in three generations (Annerstedt and Haselmayer, 2006):

- *1st Generation:* Science Push (1960s): Science- based technology zone
- *2nd Generation:* Market and Demand Pull (1980s): Science and economy interaction
- 3rd Generation: Interactive Innovation (Current)

The first generation has been perceived as "**science push**" whilst the second one seen as "**market and demand pull**". Today, the third generation is based on **interactive local flows** located in a vibrant urban community consist of science-industry-government relations and local, regional and even global innovation activities.

Development of creative, knowledge-based and technology-intensive services and sectors within certain precincts of the inner city generate important aspects of the spatiality of the Knowledge Economy (Hutton, 2004). These new innovative precincts are shaped by the integration of culture (liveliness) and urban development (diversity) by the increasing significance of technology in value-added production, and by the competitive advantage of the inner city for creative and innovative sectors.

Graham and Marvin (2004, p.78) suggest that ''as the value-added in IT industries shifts from the zones dominated by hardware producers to places that can sustain innovation in software and content, so the focus of industries may actually be shifting from Silicon Valley, Route 128-like Research and Development campuses to central, old-city locations''.

These inner city technologic sites and districts comprise not just isolated firms or ''outliers'', but rather quite substantial ensembles of dynamic industries. In this context they can be classified under the concept of urban technology precincts.

The current trend of UTP is to integrate functions of technology, industry, service and business sector and culture by combining living, working, learning and playing entities. Urban technology precincts have emerged as a principal policy issue in connection with city development and under pressure from competing city-regions due to economic globalization.

Haselmayer (2004) mentions that present urban technology precincts attempt to be interactive models of innovation, embedded in diverse urban environments. In such areas, "networks and systems of trust, the development of respective public, private or scientific partners, cultures of interpretation, and degrees of public or institutional participation as well as the availability of financial/legal instruments all form an integral part of the innovation environment's global function. Location embeddedness is no longer just a feature, but a key success factor for UTPs" (European Commission Report, 2007, p.59).

Locating in a vibrant environment is important because of supplying quality of life as living, working and playing area by creating a healthy integration with them for their talented high skilled workers. Generally, ICT based innovative areas emerged as a principal policy issue in connection with city development and under pressure from competing city-regions due to economic globalization. These processes might involve technology areas related developments such as accessibility of public services to high-tech businesses, management of clustering of competencies, real-estate asset values and the quality of the environment and place branding and marketing. New innovative environments combine technology, including computer graphics and imaging, software design, multimedia industries and graphic design industries that have been deeply influenced by technological development; culture represented by creative human capital and design functions; and place, more specifically the innovative milieu of the inner city (Hutton, 2004).

New innovative technology development areas can be named under various types according to their functional capacity, clustering environment and also their emerging process. There are new terms as living labs, technology hotspots, i-hubs, knowledge precincts, knowledge corridor and the most comprehensive knowledge city.

In this study spontaneously emerged urban technology precincts will be handled with the aim of clarifying spatial and organizational properties of spontaneously-developed urban technology precincts that affected by economic and urban trends in relation to increase in ICTs.

1.2. Structure of Thesis

The study has been conducted in five chapters, which tend to answer research questions which previously mentioned. The first chapter is the general introduction to the research problems. The second chapter is the general introduction to the transformation process of conventional technology-development areas and appearance of urban technology precincts. The aim is to define what conditions cause this appearance. Third chapter sets the worldwide spontaneously-developed urban technology precinct examples and general framework for their formation. Chapter four explores a case study in İzmir/Turkey which has shown the first indications of being SDUTP. Chapter five includes conclusions and recommendations. Figure 1.1 shows the general structure of the thesis with its different chapters, determining spatial, functional and social differentiations.

Chapter 2: I surveyed literature to clear transformation process of Science Parks, their general functional and spatial characteristics that differ by time. In this process, it emerged that increase ICT based technologies changed urban, economic and social trends and also technology-development areas. Because of that reason, in Chapter 2, I cleared main concepts that emerged with knowledge use as changing economy trend "Knowledge economy" and urban trend "Knowledge Based Urban Development". Moreover, by emerging new innovative technology-based environments, new terms like knowledge precinct, hotspot areas, living lab, knowledge corridor and so on defined.
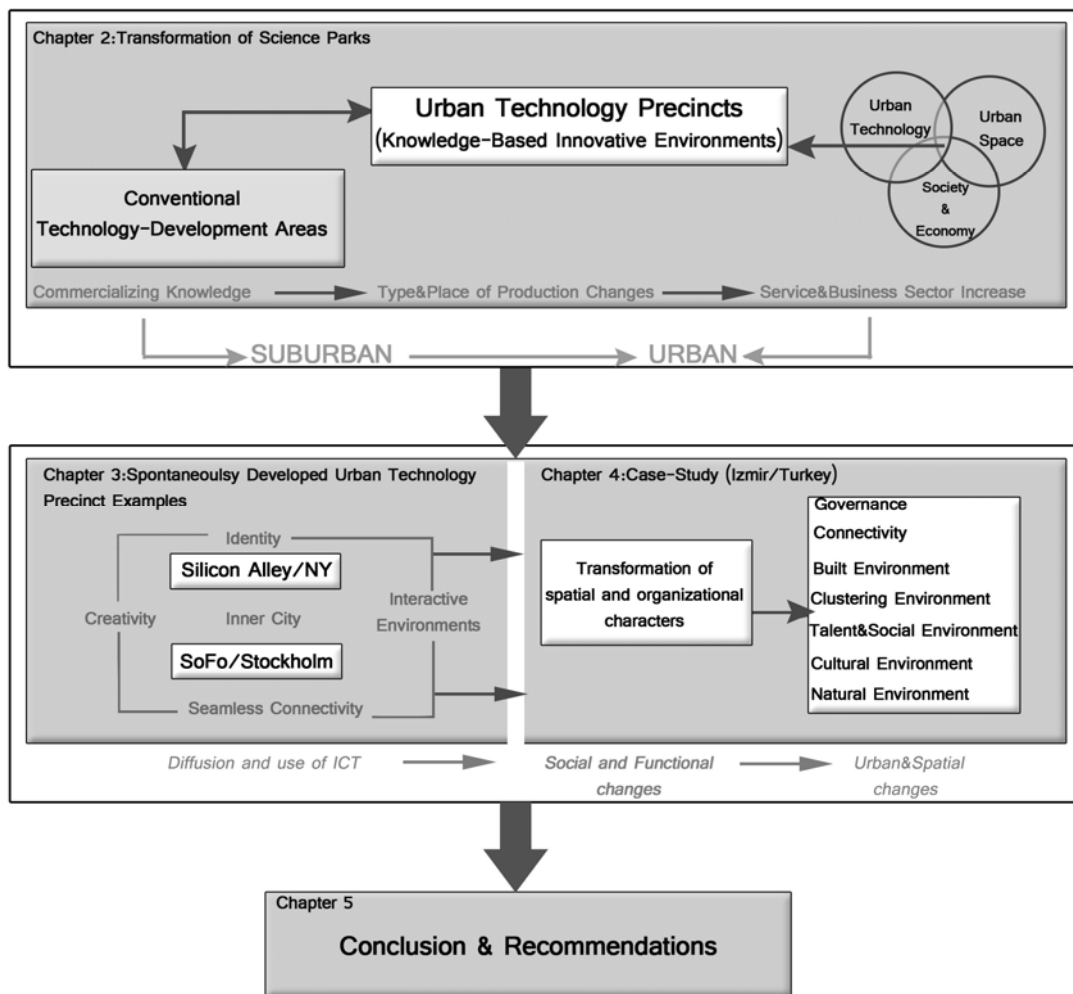
Figure 1.1. General Stucture of the Thesis

Chapter 3: Selecting of Worldwide Examples- After defining the evolution of Science Parks and emerging the concept Urban Technology Precincts*,* it is seen that there were two kinds of technology precincts one of which is planned ones that are encouraged by local governments and also private entrepreneurships. They consist of renovation process of greyfield and brownfield[1]. The other one emerges spontaneously in time in a defined part of the city. Spontaneously-Developed Urban Technology Precincts do not take place in literature in terms of their spatial and organizational characteristics.

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[1] *Brownfield* is land previously used for industrial purposes or certain commercial uses.

Greyfield land is a term describes economically obsolescent, outdated, failing, moribund and/or underutilized real estate assets or land.

However with its giant media and ICT sectors; Silicon Alley/New York is a suitable example. Beside including creative and design-based vibrant environment SoFo (South of Fokkungagatan)/Stockholm was chosen as second examples.

Chapter 4: Selecting the Case Study Area – Spontaneously-developed urban technology precincts are mostly hidden because of their self-work system. In this manner, finding a SDUTP example is difficult in real time. In this context I tried to find examples that are similar to Silicon Alley and SoFo. I considered it essential to have more than one case-study, not only to answer some parts of the research questions, but also for defining different spatial and social choice in an urban complexity. They are used when there is no adequate support in literature or when there is no clear, single set of results. Istanbul is the largest city in Turkey, as well as being the cultural, economic, and financial centre of Turkey. İzmir is the third most populous city of Turkey. Both case areas seemed as having potential for having SDUTP examples. Between 27th and 31th July 2009, first area studies done in Istanbul, but I could not find adequate SDUTP example. So, I have chosen İzmir as case area. The district of İzmir Çankaya has hotspot areas that seem having potential for being SDUTP. The area is similar to Silicon Alley with its functional character as ICT based firms and similar to SoFo with its creative environment. During case study, I collected data with face to face interviews, online contacts, internet research and observation. The conclusion of the research has emerged in qualitative data.

Chapter 5: General social, spatial and organizational characteristics were defined over worldwide examplsed and compared with İzmir case study. At the end, for İzmir example; existing local assests, non-features and the sides need to be developed were defined. Besides , what tools and interventions should be done to improve existing potential were exposed.

CHAPTER 2

FROM SCIENCE & TECHNOLOGY PARKS TO KNOWLEDGE BASED INNOVATIVE ENVIRONMENTS

During the years Scientific and Technologic Parks have taken different roles, they act as regional development organizations, provide innovation support and added value services for their tenants, and run real estate business. However, by the time changing urban and especially economic trend, they had to temporize and they faced with evolution process. In literature, science and technology parks are classified in three generations, which the last generation is accepted as the current century (Kakko, 2009; European Commission Report, 2007; Annerstedt, 2006; Haselmayer, 2004).

Today, although some conventional concepts are alive by temporizing to the impact of economic and urban context changes, 21st century compose new ones which are mentioned as "Contemporary Concepts: Urban Technology Precincts (UTP)". The aim of this chapter is to clarify their general spatial and organizational characters under the evolution process to show differences with the current time innovative technology environments.

2.1. First Generation of Technology-Based Development Areas

Technology development areas act as a science-based technology zones and the aim is to supply wider economic goals and objectives under regional impact for university and energize the business community around it. The innovation aspect of first generation is 'science push' (European Commission Report 2007, p.6) and also "technology push" (Kakko 2009). The many new ideas stemming from research and experimental development (R&D) should be channeled without difficulty to new firms established within or collected around or in the neighborhood of the science park. It is a 'linear approach' to innovation, which sees scientific results as raw material, for innovative activities among the business firms in the science park.

2.2. Second Generation of Technology-Based Development Areas

In second-generation technology developments, science and economy interaction starts with the effect of national impact. These areas such as technopoles prefers in large-scale areas and far away from universities and city. The innovation aspect of a second generation is 'demand pull'. It is market-driven to a higher degree than the first generation developments. This stage technology development areas, are less concerned with the early exploitation of scientific results because the products are used for innovating firms as a commercialize commodity. Toward the end of the 1990s, the conception of three factors of production: land, labor and capital started to change. Before that, knowledge, education, and intellectual capacity were considered as secondary, if not incidental, parameters of production human capital was assumed to be either embedded in labor or just one of numerous categories of capital. In the last decades, however, it has become apparent that knowledge in and of itself is sufficiently important to deserve recognition as a fourth factor of production. In the globalizing knowledge-based economy, knowledge and information and the social and technological settings for their production and communication were seen as keys to development and economic success (European Commission Report, 2007, p.58).

The replacement of physical commodity production by more abstract forms of production (e.g. information, ideas, and knowledge) has supported the importance of central places (cities) and led to the formation of knowledge cities. It is mainly in cities that knowledge is produced, marketed and exchanged.

Rapid advances in information and communication technologies (ICTs) during the last two decades established the infrastructure that enables the knowledge economy to scale up. "The main novelty of the knowledge economy consisted of the need to manage an intangible asset that, in contrast to material resources, does not depreciate through use but rather becomes more valuable the more it is used"(Yigitcanlar, 2007, p.3).

According to Buckley and Mini (2000) a city's knowledge economy is the economic wealth and well being that results from the effective investment in people and ideas that create an environment where information, creativity, goods and services are produced and exchanged, drawing on best practices. It requires a skilled labor force, up-

to-date knowledge, effective use of technology (primarily ICTs), and broad city resources that foster a productive urban economy.

In this process, communication, good governance and partnerships are developed with all major stakeholders. Corey and Wilson (2006) underlined the important role of ICTs in developing a knowledge economy and knowledge based urban development. Knowledge based urban development is a powerful strategy for economic growth and the post-industrial development of cities and nations to participate in the knowledge economy. New economy (knowledge economy) has two purposes to shape the cities; the first one is, it is an urban development strategy that codifies technical knowledge for the innovation of products and services, market knowledge for understanding changes in consumer choices and tastes, financial knowledge to measure the inputs and outputs of production and development processes, and human knowledge in the form of skills and creativity, within an economic model.

2.3. Third Generation of Technology-Based Development Areas

The concepts of "Creative and Innovation" are the seedbeds for the current time technology developments called as third generation. The innovation philosophy of the third generation is 'interactive innovation'. It is both 'science push' and 'market-pull'. The knowledge transfer leaves its place to knowledge exchange and knowledge becomes a competitive and commercial issue for cities as it is mentioned before. It departs from an underlying 'linear model' of innovation, while making more effective use of the network overlay of communications in university-industry-government relations. In the third generation, innovative environments tend to appear as outcomes of these functional interactions because of supplying the aim of 'interactive local flows'.

While Fritz Machlup (1962) introduced the concept of the knowledge industry, he distinguished five sectors of the knowledge sector: *education, research and development (R&D), mass media, information technologies, information services*, today by the effect of ICT knowledge intensive sectors exemplified by software design, internet design and services, computer graphics and imaging, multimedia and biomedical industries.

Richard Florida (2002) adds the creative industries as Music, Visual arts, Publishing Sector based on writing and literature, Audio-visual and media sector,

Performing arts, Multimedia, Cultural tourism, Cultural heritage, Design: architecture, graphics, industrial, fashion, advertising.

According to Manuel Castells, many cities worldwide face the prospect of major transformation in the 21st Century as the world moves towards a global information order.

By the increase of knowledge and creative service and business sector, the location choice of new technology-based developments moves to vibrant environments. Annerstedt (2006) adds that especially first and beginning of second generations are suburban technology developments; third one has a tendency such innovation environment to go urban aiming for better competitiveness, more sustainable urban development, and higher attractiveness as catalyst in the knowledge society (See Figure 2.1).
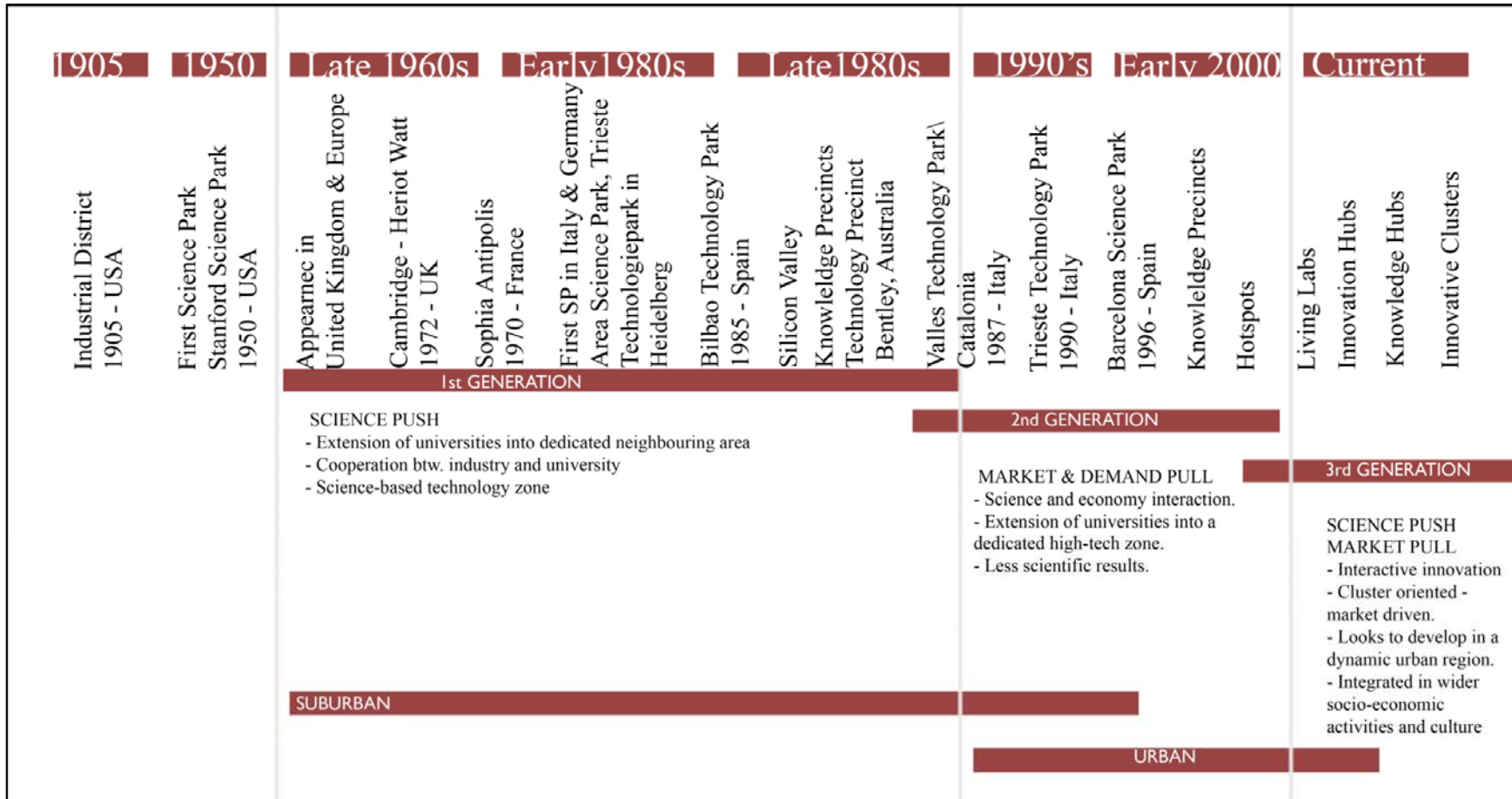
Figure 2.1. Evolution of Technology Precincts
(Source: Vanhoudt 2000, Vila 2008, European Commission Report 2007)

In third generation technology-based development areas, various new formations emerged. They can be summarized as in figure 2.2.
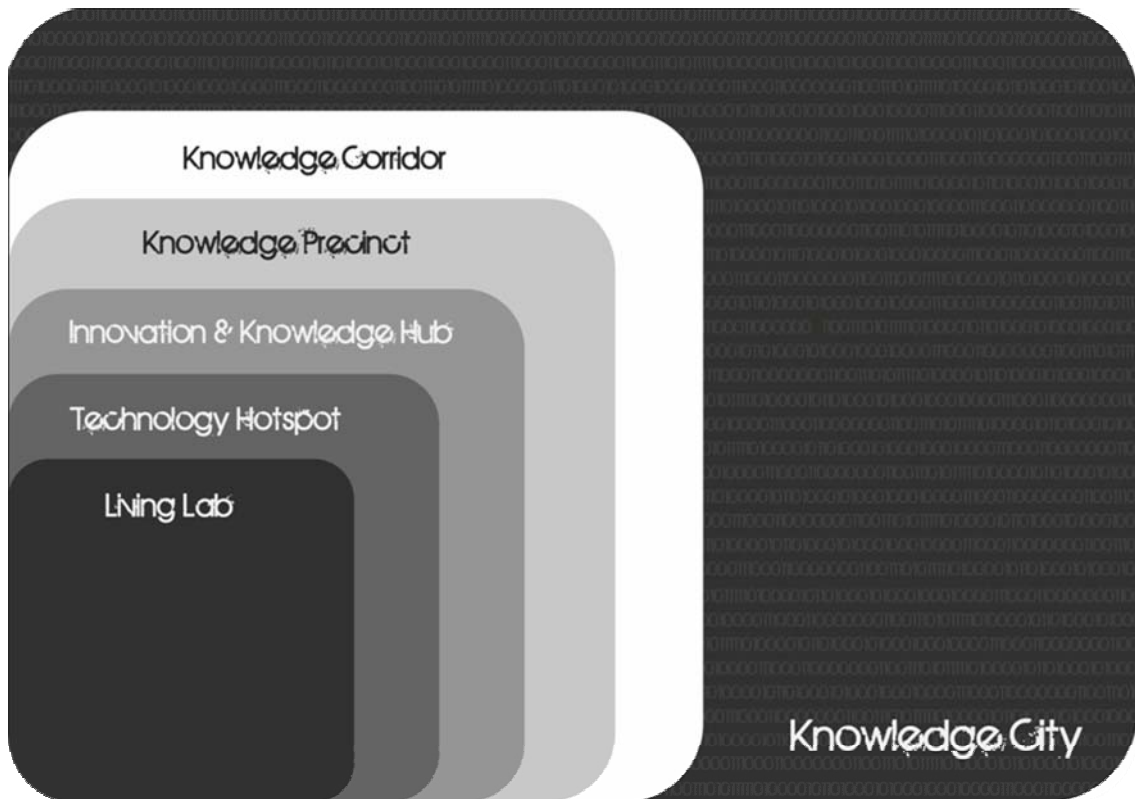
Figure 2.2. Scale of New Technology Precincts

They are interdependent and interrelated – scales of Knowledge/Creativity. These scales have soft edges. Connections across all scales are part of the overall knowledge assets in a city. The living labs are the smallest part of urban technology precincts. They study as a laboratory that consist ICT based technologies. These labs can take place in a single building or a flat. Technology hotspots seem similar to living labs. However, hotspots can take place in any place in inner-city. They can be recognized with their knowledge identity. They emerge spontaneously in a part of the city with accumulation of ICT based firms and also business and service sectors. Sometimes a technology hotspot area can consist of streets that include many ICT based firms. When we go up to upper scales, their covering land area and including functions can change. For example, knowledge precincts are seen as developer engines of growth and creative urban regions. (See Koh et al., 2005).

A knowledge precinct promotes and manages the flow of knowledge and technology amongst universities, research and development (R&D) institutions, companies and markets, as well as facilitating the creation and growth of innovation based companies through incubation and spin-off processes, and providing other value-added services such as high quality space (including living and recreation areas) and facilities (Yigitcanlar, 2008). Knowledge city takes place on the highest scale of data. It can consist all of those urban technology precinct examples.

2.4. Summary

When we compare the 1st and 2nd generations with current time 3rd generation, it is clear that knowledge industry shifts from material production to knowledge and creative production. This causes the death of industry-based areas and birth of business and service sectors (Figure 2.3).
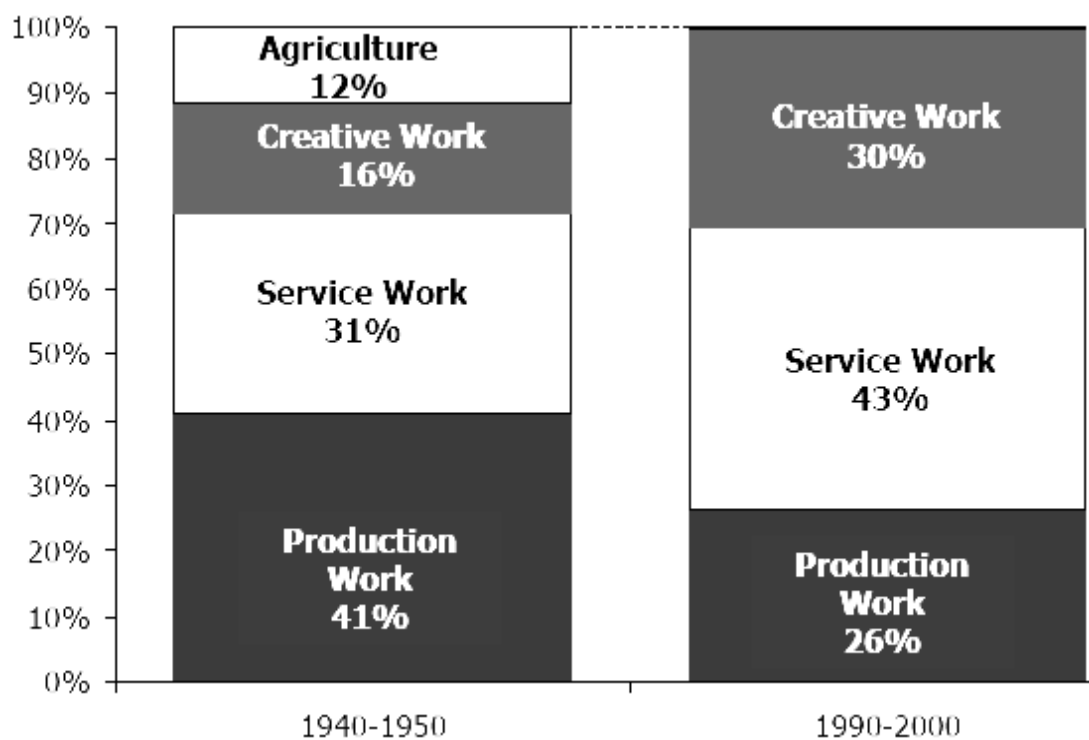
Figure 2.3. Changing Nature of Work
(Source: Walesh, 2007)

Third generation areas tend to promote a wide variety of interactions and the appearance of mixed-use environments, blurring the boundaries between physical, digital, economic, social and cultural spaces.

Multidisciplinary is the main feature of these creative communities, where we can find a high density of knowledge intensive workers, who look for quality of life, inclusive environments, social and cultural diversity and digital and physical connectivity. In other words, these are try to supply good places to work, live, learn and play.

The recognizable difference between the conventional and the contemporary technology development areas appeared in business and service sectors due to execution of accessibility, flexibility, seamless connectivity, integrated functions; live – work - play and place identity.

Table 2.1: Requirements of 3rd Generation Technology Development Areas
(Source: Tidd 2003)

Business Requirements	Attracting the right people
	Interaction and Communication
	Accessibility, Openness and Convenience
	Flexibility-Functional, Financial & Physical
	Image - identity / Differentiation
Spatial Requirements	Diversity of accommodation
	Concentration of functions and people (intensification)
	Dispersal - supporting people wherever they work
	Identity / Sense of Place
Requirements of "Knowledge Workers"	Increasing mobility of workforce
	Increasing focus on quality of life
	Greater provision of leisure and amenity

Today in 21st century cities recognize the importance of commercializing knowledge. So, urban technology precincts can be seen as the main pioneer of local and global economy.

CHAPTER 3

URBAN TECHNOLOGY PRECINCTS

In literature we come across with many types of urban technology precinct examples as it is mentioned in previous chapter. They differ according to their scale, emerging process or including functions. They can be examined under two main headings as being planned or spontaneous. Planned examples are mostly big budget projects that include rehabilitation or renovation of old industrial areas to knowledge based areas. Those projects are encouraged by local government, private entrepreneurships and also universities. For instance, One-North project in Singapore is the most known and popular example for planned UTPs. Moreover, 22@BCN project is a renovation project that transforms 200 ha of industrial land of Poblenou into an innovative district offering modern spaces for the strategic concentration of intensive knowledge-based activities.

In this chapter, spontaneously-developed urban technology precinct examples Silicon Alley/New York and SoFo (South of Folkungagatan)/Stockholm were examined with the research of INTELI (2007) and Hutton (2004). They are used as an analysis tool to understand the main characteristics of new urban technology precincts.

INTELI Project (2007) was conducted under two main questions of (1) how science, technology, innovation and creativity can be placed at the service of urban policy and redevelopment and (2) what the best practices are that should underlie the definition of urban policies as regards the design and planning of innovation hubs.

The study examines new innovative knowledge intensive areas around worldwide with methodology concerning definition of a conceptual model, establishment of a set of dimensions of analysis, construction of a system of indicators and extraction of conclusions. Case studies are reviewed according to those seven dimensions (see Figure 3.1);

- *Governance* refers to the coordination of actors public and private-involved in the management of the innovation habitats.

- *Connectivity* is related to physical accessibility, such as transport networks, as well as to digital infrastructures and flows.

- *Clustering Environment* is associated with the business climate and knowledge infrastructure of the innovation hub and with the interactions between universities and other research institutions and companies.

- *Talent and Social Environment* concerns the human capital component, comprising the level of qualifications, mobility and diversity of the residents and workers in the innovative community.

- *Built Environment* includes aspects related to the physical dimension (namely urban design) of the innovation hub and includes land use, urban grid, architecture, public spaces and urban art.

- *Cultural Environment* comprises cultural and entertainment amenities located in the creative hub as well as public attendance of cultural events and visits to historical sites (heritage).

- *Natural Environment* is related to the natural system of the area (waterfront, green spaces, etc.) in addition to the environmental quality (water, air, soil, etc.), weather, climate and energy, namely the use of renewable sources.

Figure 3.1. Dimensions of analysis of INTELI
(Source: INTELI, 2007)

Thomas Hutton (2004) analyze new innovative industry clusters within the inner city and he summarizes that they constitute important features of the spatiality of the knowledge economy, besides including computer graphics and imaging, software design, and multimedia industries as well as technologically 'retooled' industries such as architecture and graphic design. According to his research in London, San Francisco, Vancouver and Singapore, he addresses key developmental factors by emphasizing the importance of ''space and place'' shaping the location and morphology of these areas.

The structure of urban technology precincts within the inner city represents defining features of the convergence of technology including ICT and technology-intensive production processes, culture as represented by creative human capital and design functions, and place, and more specifically the innovative milieu of the inner city. Interaction and interdependency of these factors have supported the development of new urban technology precincts.

Hutton (2004, p.91) defends the importance of cultural influences as underpinning features of new industry formation within the core. He adds that many knowledge economy industries and firms choose their locations in the creation of ''cultural products'' i.e. goods and services imbued with high design values and symbolic content. In the wake of the crash of the dotcoms, the defining industries of the inner city's knowledge economy comprise firms, which combine creative inputs and applied design with technology-intensive communications and production systems in the fabrication of high-value outputs. These include long-established industries such as architecture, industrial design, graphic arts and design, and fashion design, as well as archetypical industries exemplified by software design, Internet design and services, computer graphics and imaging, and multimedia industries. These new knowledge intensive sectors are accumulated dynamic firms that tend to locate in proximity to each other. Those areas are also rich in terms of place qualities such as cultural insight, imagination, and originality. Local systems of production supply the quality of the area. Knowledge service sectors, that dominate Internet software, digital design, and World Wide Web services tend to concentrate into small number of gentrifying metropolitan areas.

Hutton (2004, p.93) labels these new innovative precincts as "New industry clusters within the inner city" and composes a typology for them according to their specialized production in the inner city according to space-place relation.

He distinguishes stages of development in the evolution of the inner city's Knowledge Economy and identifies at least a preliminary way the distinctive spatiality of new production formations in the metropolitan core. He develops a provisional typology of inner city new innovative sites and spaces, including:

1. *Extensive Production Districts* are extensive terrains of inner city space which encompass both dispersed and more concentrated distributions of knowledge economy firms (e.g. ''Multimedia Gulch'' in San Francisco, 22@ BCN –Barcelona, areas of the City Fringe in London), as well as a more mixed pattern of other land use types and industrial activities. These relatively large territories can incorporate both primary sites of knowledge intensive business and service sectors and proximate areas of supporting businesses and industries. Within these districts, large stocks of underutilized, older industrial and commercial buildings can be renovated and readapted for new industries and employment, on sites, which offer lower land costs and rents than those typically found within the CBD.

The redevelopment of these districts for new innovative precincts tends to be driven (or at least initiated) by market actors, although local government and public agencies can play important roles, for example by promoting zoning and land use policies, and by introducing building by-laws which facilitate the establishment of new uses. New production districts often comprise contiguous territories of heritage districts and older commercial and quasi-industrial areas in the CBD fringe and inner city, encompassing ensembles of industries and firms linked by complex input–output relations, but may also include precincts within the CBD. Here, knowledge economy firms have in some cases taken advantage of lower office rents ensuing from oversupply, and reduced demand associated with corporate restructuring to ''recolonise'' marginal quarters of the CBD.

2. *Induced Compact New Industry Clusters* are the second typology and they have similar with production districts in terms of that government and public agencies play main role to make changes in land use policy and zoning schedules designed explicitly to promote knowledge intensive industries (for example the False Creek Flats high-technology project in Vancouver), to public equity participation in property and/or buildings. Heritage policies and programs can also be seen as central to the preservation of buildings and sites for new industries. The difference is knowledge economy clusters take the form of more compact inner city sites within which agglomerations of knowledge economy industries and firms are situated.

3. *''Signifying'' Knowledge Economy Precincts* is another typology of planned urban technology precincts that executes the definition of ''epicentres'' of the knowledge economy of the inner city, consisting critical production functions as well as redefining attributes of consumption, lifestyle and urban imagery.

Signifying precincts differs from other typologies, as they are <u>big scaled and long running</u> projects. Typically, they cover more than one kilometer square in extent and often tightly bounded by major arterials or structures that effectively contain these sites. These areas offer special opportunities for social interaction and information exchange. Signifying precincts vividly demonstrate both the synergies of culture, technology and place in the knowledge economy, as well as the interaction of economic and social worlds in the inner city.

4. *Spontaneous New Industry Clusters* are in which market actors have initiated redevelopment, transition, and new industry formation. Silicon Alley in New York and Victory Square-Gastown Vancouver can be examples for this typology.

5. *''Incipient'' New Industry Districts and Sites:* These areas are the fresh, recent innovative precincts in the CBD. Hutton calls them ''Incipient'' new industry sites, which exhibit early signs of transition from older industrial, commercial or residential activities to new knowledge sites, typified by ''pioneer'' knowledge economy firms in formerly derelict or vacant buildings, or by hybridized creative services/technology-intensive businesses in existing commercial areas. Examples here include Stratford (Newham)-London and mid main District- Vancouver and so on.

According to his research, the emergence of these new territorial forms of industrial activity, differentiated internally by scale considerations, industrial mix, and functional specialization, among other factors, represents the reorganization of urban space to meet changing market demands and ascendant forms of intermediate services production.

When we combine the core point "Governance" view of INTELI (2007) with the space typology of Hutton (2004), it is clear that we can examine urban technology precincts under two headings as "Spontaneously-Developed Technology Precincts" and "Planned Urban Technology Precincts".

3.1. Worldwide Examples of Spontaneously-Developed Urban Technology Precincts

This section aims to illustrate spatial and organizational characters of spontaneously-developed urban technology precincts over worldwide examples according to analysis framework described in the previous section. Two well-known case study are chosen considering their success, popularity and branding in terms of knowledge-based development. Situated in the context of New York's development as a global city, Silicon Alley is the first example including advanced producer services and the dramatic growth of ICTs in an increasingly transnational economy. Silicon Alley is a very popular area in terms of being an industry cluster of about a thousand new media firms since the early 1990s. Another example is known as SoFo (South of Folkungagatan) a design district in Stockholm established in 2002 within a neighborhood that previously was residential (Koskinen, 2009). Today, the area became the hub of fashion in Stockholm. These two examples emerge with not only intended for ICT but densely media, design, and art. These both areas provide a frame, focus, and leadership; as well as pool resources for creating, running, and maintaining design as a core element in the district's identity (Koskinen, 2009 p. 13). One of the common properties for these areas is emerging by quality of creative work relations in contemporary business services and knowledge-intensive service networks, mediated by advanced ICT infrastructure. Both Silicon Alley and SoFo are one of the success stories for spontaneously-developed urban technology precincts. Because, in the beginning, they developed without preoccupation, today they became the most known creativity based innovative areas.

3.1.1. New York: Silicon Alley

Silicon Alley is a reflection of media industry in Manhattan which had continued during 1970s and 1980 with the impact of traditional media on the economic and cultural life of New York (Indergaard, 2003). The growth of Silicon Alley starts at 1992 by witnessing the explosive growth of a qualitatively different symbiosis of ICTs, structural innovations, and cultural creativity that has come to be known as the 'new media', multimedia, or cyber-industry.

Silicon Alley is a media and ICT based cluster which referred to the cluster of such companies extending from the Flatiron District down to SoHo and TriBeCa along the Broadway corridor, but as the location of these companies spread out, it became a general term referring to the dot com industry in New York City as a whole (Figure 3.2). One of the primary reasons Silicon Alley has been so successful because "The Alley" draws people from all corners of the earth (see www.siliconalley.net). They come to live and work together in this ever-growing high-tech area. The cultural blend and diversity of ethnic traditions, viewpoints and value systems have enriched all of their lives. Silicon Alley has become a model of how diversity can add strength and unity to a complex community.

The Silicon Alley includes businesses that provide on-line (Internet or World Wide Web) and CD-ROM products and services. It also includes many parts of well-established industries such as publishing, broadcasting and advertising, where firms use emerging technologies to distribute their products. Another high-growth part of this industry is "intranet" development, which concerns use of Web technologies for internal corporate communications and related purposes.

Figure 3.2. Location Map of Silicon Alley
(Source: Google, 2010)

Hyper-accelerated rates of change and unusually high levels of cooperation between competitors also characterize the new media industry in New York. These attributes are particularly apparent at 55 Broad Street. Tenants in the building include full-service ad agencies and media companies as well as specialist ISP's and programmers. Because of the constantly changing technology, firms of all sizes at 55 Broad Street find it useful to share ideas, concepts and programming code with one another (Interactive Media Lab. www. iml.jou.ufl.edu).

Silicon Alley takes its power from its corporations and inter-firms. Today it is home for giant media, finance, business and ICT based corporations such as Time Warner, Viacom Advance Publications, National Broadcasting Co. (NBC), the Columbia Broadcasting System (CBS), The Hearst Corporation, and Dow Jones & Co. (Indergaard, 2003). Each of these giant corporations consists of several subsidiaries, i.e. they are the result of multiple mergers and acquisitions and are continuously involved in processes of reorganization and restructuring (Figure 3.3).

Figure 3.31. Inter-firms of Silicon Alley
(Source: New York Times (March 10, 2006))

In terms of their service relationship to various market segments, the firms in this area are most closely associated with advertising and marketing (59 percent), entertainment (37 percent), information/reference (43 percent), education (31 percent), financial services (28 percent), and others. The largest business customer segments besides publishing, advertising, new media, and information technology are entertainment, financial services, telecommunications, education, broadcasting, retailing and other business and commercial services saw the largest amounts of growth, between 14 percent and 48 percent, since 1995/96). The percent increase in the share of financial services (48 percent), new media (39 percent) and information technology (33 percent) sectors illustrates the tendency for Silicon Alley growth to feed on itself.

Smaller customer industry segments such as health care, cultural, and government also experienced disproportionately large increases, e.g. government almost doubled its share from 8 to 15 percent (Coopers & Lybrand 1997, p.36).

Figure 3.4. Illustration for Silicon Alley Environment
(Source www.iml.jou.ufl.edu)

Silicon Alley is a central site for a region, which is concentrated of multimedia firms, which have their own success. This occasion create a highly dynamic and self-sustaining, almost autonomous development for the area. Three types of actors allowed them to dominate the making and mobilizing of Silicon alley networks. Venture Capitalists provided information, connections and advice as well as capital, in exchange for equity stakes and managerial influence in firms (Indergaard, 2004 p.18). Second one was corporations that mentioned above supplied the success. Finally, real estate initiatives control the spatial transformation of the built environment. Silicon Alley is named as *nested space*[2] that shaped within the market –centered system.

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[2] Richard Child Hill and Kuniko Fujita use the term nested spaces to explain the role of national differences in their institutional settings.

This provides flexibility in location choice of corporations. The inter-firms choose to locate near with the business and service sectors to live and work in accord. The typical location pattern of Silicon Alley within Manhattan can be characterized as a concentration within urban centers or even specific streets, building complexes or buildings that facilitated by a low need for office space and the location preferences of the creative key personnel. For instance 1106 out of 4881 firms (Fuchs, 2000 p.564) are concentrated in one small area of Manhattan (Silicon Alley) (Figure 3.5). This shows the persistence of agglomeration effects, the concentration of multimedia production attracts even more firms and staff. The being on a specific street adds a local identity to Silicon Alley.
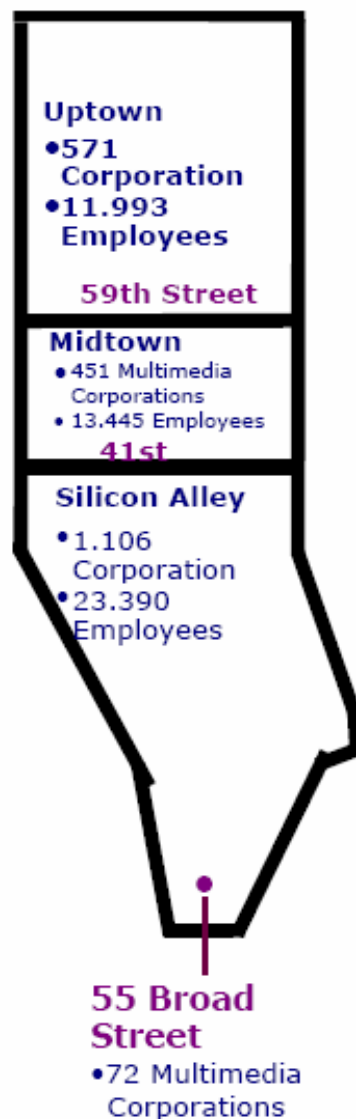
Figure 3.5. Multimedia Employment in Manhattan
(Source: Fuchs, 2000 reference to Pavlik 1999: 84)

3.1.2. Stockholm: SoFo (South of Folkungagatan)

SoFo is a new design district, which is located in Södermalm, a district of Stockholm, Sweden, established in 2002. The neighborhood began to change about a decade ago, when it first got a row of restaurants, and then became the hub of independent fashion in Stockholm. The area emerges as a pun on Silicon Alley (Soho) and is an invention of local entrepreneurs who have attempted to re-brand the area as a centre of creative and innovative fashion and retailing since 2003.

SoFo is a mixed used environment and like Silicon Alley it is home to many other creative industries in Stockholm, including advertising agencies, media companies and publishers. Although compact, SoFo also offers a wide selection of restaurants, bars, coffee shops, and art galleries.

It is also includes other social and recreational local places as Nytorget, a city square with a playground and small park and Vita Bergen, a larger park which commands excellent views over Stockholm. Vita Bergen also has an open air theatre which has music and dance performances during summer, and offers steep tobogganing in winter. Because of being at CBD, access to the area is efficient for everyone by metro and bus stations. Although, SoFo is in progress, it has about ninety members and it is known as the place to go for independent fashion, art, and design in Stockholm (Koskinen, 2009).

Figure 3.6. Shops in SoFo

In this district, one of the capital's trendiest, a huge selection of stores and cafés, each with its own individual styles can found. Three words best describe SoFo's atmosphere: young, hip and laid-back (Koskinen, 2009, p. 7).

Young people, artists, and designers make their way here to live and work, giving the area a very distinct character. This is where independent visions of fashion, art, and form unite to create eclectic atmosphere. SoFo is the place to find a variety of individual shops, young fashion, accessories, the best records, interior design and unique pieces. Small restaurants and cafés enhance the SoFo charm (http://www.sofo.se). The area is live and vibrant at 7/24. Lively and diverse environment add a different identity to the area. Design is a real phenomenon for the area. It creates design-based identities such as their logo, event night, and identity based shops. Although SoFo is at the beginning of the process, there are some gaps in its development. For example, In SoFo, the organization is more informal. Shop owners can freely use the name, provided that Per Holm, who invented the acronym, accepts them.

Design District SoFo organize activities, websites, and shopping maps, to attract certain types of customers and businesses; pushing development in an increasingly more artistic and design-oriented direction. For example, it organizes monthly shopping nights. Many SoFo shops stay open late (until 21:00 / 9 PM) the last Thursday each month. Expect to find happenings such as live music sets, various fashion shows and exclusive offers for that night only along with much more.

To sum up, in spite of being newly designed area, SoFo attracts an alternative, "hip" culture rather than the international brands and luxury goods typical of Östermalm's main shopping streets. SoFo leads a significantly more tranquil life; free of policy pressures.

3.2. Discussion on Selected Worldwide Examples

This brief investigation of worldwide examples shows that both case areas depend on ICTs, media, creative based industries, knowledge intensive sectors, taking place in CBD/ in the part of urban, which is also the focal point as "place" and the character of the area are still important. While it is worthwhile to look at old theories on agglomeration dynamics, it is equally important to take account of changes; for example, the undoubtedly significant changes in the way corporations decide on the location of their research and production units (Fuchs, 2000).

At the same time, the particular characteristics of place have become more important and corporate strategies have become more flexible.

Creating flexibility, variety and place quality can be considered as key factors for to pull corporations to those kinds of areas. Being near to all facilities, all social and recreational functions are the framework that behind the concept of connectivity for those. The hiding point is to creating compact mixed-use environments, which consists of all our needs as *Work- Live-Play-Learn.*

Emerging spontaneously is the general property for both examples (see Table 3.1).

Table 3.1: Assessment of Worldwide Examples based on analysis framework

		SILICON ALLEY / NEW YORK	SOFO/ STOCKHOLM
SPONTANEOUSLY DEVELOPED URBAN TECHNOLOGY PRECINCTS	TYPOLOGY	Compact Knowledge Economy Cluster	Incipient New Innovative Precinct
	GOVERNANCE	* Corporations and interfirms * Bottom-Up Approach *Market-Centered System	* Local Entrepreneurs * Bottom-Up Approach *Market-Centered System
	CLUSTERING ENVIRONMENT	* Existing Local Context * Clustering Areas: On -line (Internet, or World Wide Web) and CD-ROM products and services and also publishing, broadcasting and advertising	* Existing Restaurant and local contex * Clustering Areas: Fashion and Retail Advertising agencies, media companies and publishers.
	CONNECTIVITY	* "intranet" development * Integrated with the region	* Transport connections * Near to local social and recreational social places
	TALENT & SOCIAL ENVIRONMENT	* Qualified multimedia, business,finance and service sector	* Qualified designers, publishers, retail owners and also artists
	BUILT ENVIRONMENT	* Live and work together * Closesly associated with service and business sector * Diverse and Strenght Complex Community which add an identity to the	* Mixed-use Environmentalso * Includes other social and recreational local places * Distinct Character
	CULTURAL ENVIRONMENT	* Cultural blend and diversity of ethnic traditions, viewpoints and value systems	* Design-based identitites * Cultural Activities
	NATURAL ENVIRONMENT	* Not enough information	* Not enough information

Although there are relevant differences between the political, economic and social contexts of the countries and the regions/cities analyzed, a comparison of the worldwide examples can be fruitful in identifying intersection points and general organizational needs. As it has mentioned above urban technology precincts are shaped via strong leadership or growing autonomously. Good physical and virtual connectivity is also essential for social, institutional and territorial interaction within the area, fostering its integration into the city and the overall city-region. Existing technological and social infrastructure is important for ICT based firms' location choice.

For example in Silicon Alley there are virtual connections between all finance, media, and business sectors. In terms of physical connectivity, all examples prefer to supply the concept of centrality to premium access to different infrastructure, services and amenities. Besides these, we can mention that face-to face contact is still matter for corporations and customers; therefore social network and also pedestrian orientation are the certain property. When we look at the clustering environment, all examples prefer to create functional mix. This makes it easier for innovative ideas to float more easily. The ecological argument of cross-industry and resource spillovers leads to the prediction that firms are more likely to survive when located in areas where firms are operating in a variety of related industries like Silicon Alley (Fuchs, 2000). While SoFo prefers creative based functions with commercial unities, Silicon alley prefers to bring together ICT and Media. On the other hand, both SoFo and Silicon Alley put themselves forward by fashion; multimedia, advertising. The main idea behind the clustering concept is to create a suitable environment for pulling other knowledge-based services and knowledge workers. As we see in Silicon Alley, the proximity among companies is essential for talented knowledge workers to stimulate learning and creating compatible knowledge spillover effects (Yigitcanlar et al., 2008d, p. 13). In all examples knowledge workers such as researchers, artists, and scientists choose to live and work in urban technology precincts.

If we look at cultural environment, Silicon Alley and SoFo use potential of existing cultural environment then being pioneer to new ones. Concerning the natural environment, the need of green area can be defined as key factor for spontaneously-developed inner-city technology precincts to choose their location in urban CBD.

3.3. Summary

These brief reviews of worldwide cases suggest that SDUTPs has an infiltration-based development of corporations and firms in inner city. At the beginning, these areas prefer the most suitable areas in CBD with the effect of market-economy, however after that they starts to transform their environment positively. The result of this, it can be said that, these environments creates vibrant, distinct identical and interactive area by the time with supplying interaction with existing local context.

This kind of entity makes these spontaneously-developed urban precincts more durable and sustainable against possible problems. Their robustness can be accepted more than planned ones because of behaving like a living organism. Need of being near to knowledge-based business and service sectors bring intersection of multi uses and being in a mixed-use environment. When we examine SDUTPs in terms of urban design, existing social, cultural and natural amenities shape their emergence. Because of this reason, interventions to the environment can be difficult. Urban design tools can be limited with small touching as restoration of historical buildings, streetscape, color of buildings besides adding new advertisement tools as kiosks, signboards. These implementations can be done with the help of local government, private entrepreneurships and existing universities support.

Actually, we can say that for all urban technology precincts, interaction among the different environments – residential, business, finance, and media, recreational, social and cultural - stimulates the dynamics of the area. As we compare the worldwide examples, best practices point to the presence of good knowledge infrastructures in cooperation with companies of creative or soft industries. A culture of entrepreneurship is also important. Besides the presence of knowledge and creative workers, the environment tends to be diverse, multicultural and vibrant, with the presence of foreign talents.

Congregation of small - medium entrepreneurships constitutes spontaneously-developed urban technology precincts. In knowledge based development as it has mentioned before innovation and creativity have a significant role (Winden and Berg, 2004). In this context, knowledge intensive firms become together at the place where consists of interaction of liveliness, diversity, mix used environments, quality of life, flexibility and adaptability.

On the other hand, identity of place is the other most important key for knowledge based development and urban technology precincts. At this point after their emergence process and at the time for their improvement government or private investors should admit their role in this scene. For instance, governmental policies such as land use, zoning decisions or promoting policies can be developed. As a source of local economic development and supply matter of political and social prestige of cities, beside planned ones potential of spontaneously-developed urban technology precincts cannot be ignored.

Table 3.2: General Characteristics of Spontaneously-Developed Inner-City Technology Precincts
(Source: INTELI, 2007)

		CHARACTERISTICS						
COMMON PROPERTIES	2	GOVERNANCE	CONNECTIVITY	CLUSTERING ENVIRONMENT	BUILT ENVIRONMENT	TALENT & SOCIAL ENVIRONMENT	CULTURAL ENVIRONMENT	NATURAL ENVIRONMENT
	SPONTANEOUSLY DEVELOPED	* Market-Centered System * Bottom-Up Approach	* Locating at Central Business District * Walkable distant * Virtual Connectivity	* Knowledge and creative intensive sectors	* Infiltration Based * Mixed-use (Working-Living-Learning-Playing) Environment * Interactive environments, * Proximity to business and service sectors	* Qualified human resources * Knowledge and creative workers * Diverse and multicultural environment * Social networks	* Existing Cultural blend * Distinctiveness and unique identity ('Genius loci') * Cultural and entertainment facilities * Vibrant and inspiring life	* Developing Potential Assets * Creating Environmental quality

CHAPTER 4

SPONTANEOUSLY-DEVELOPED URBAN TECHNOLOGY PRECINCT IN İZMİR

In this chapter, traces of spontaneously-developed technology precincts are examined in Turkey. Firstly, it is thought that Istanbul is the best possible option for such kind of development since the city has already recognized as the highly innovative and attractive city worldwide. OECD (2008) acknowledges Istanbul among the fastest growing OECD metro-regions, mentioning that its economy is changing from one driven by labor-intensive activities to one based on knowledge industries. Moreover, Istanbul is identified as a Capital of Culture (MAKCI 2009, p.16). This concept appears to have developed into a strong and meaningful brand name for Istanbul. For instance, the European Parliament has recently declared Istanbul as the Cultural Capital of 2010. Istanbul has an important place in global knowledge economy with its regional hub character for activities like finance, logistics, tourism and culture. Kadıköy-Pendik axis has been defined as a technology development zone in Environmental Plan. It proves to be difficult to find SDUTP areas in that region. Preliminary field surveys and observations assert that despite some innovative developments, we could not reach the main expectations as find compact innovative urban technology hotspot areas. After that, we started to examine another possible case in Turkey-İzmir. İzmir-Çankaya District that consists of too much knowledge intensive and ICT based business and service sectors. It was thought that the area has a potential of being spontaneously-developed technology precinct. Şair Eşref Boulevard in the area has also hotspot character.

In this chapter, possibility of İzmir Çankaya district and Şair Eşref Boulevard having hotspot character is scrutinized in terms of assessment criteria developed in the previous chapter.

4.1. Knowledge-based Development in Turkey

Turkey has always had a continuous and strong desire to take its part in global system only after 1980s with its ICT based research. Today, Turkey as an emerging liberalizing economy attracts attention worldwide (Yelkenci, 2006). Its continuous growth and increasing global competitiveness in the knowledge economy are recognized both by the OECD and EU countries (OECD, 2005). In 2006, TBMM of Turkey has established a new five-year development plan for 2007-2013 that focuses on becoming a knowledge society. The action plan associated with this national strategy recognized many priorities including integration of ICT in businesses, technical modernization of public services, global competitiveness in the ICT sector, improved efficiency and access to IT infrastructure and services, and the encouragement of R&D (TBMM official newspaper, 2006).

4.2. Knowledge based Development in İzmir and Background Information on the Case Study Area

According to socio-economic development and competitiveness index, İzmir is the third biggest city of Turkey and it is the center of the Aegean Region (İzmir Development Agency Development Plan 2009-2013). İzmir has natural, cultural and also knowledge assets besides high institutional structure, information and communication infrastructure and strong access networks.

As it was mentioned before; like Istanbul, İzmir is also affected by knowledge economy in terms of its local economic development. When we examine the 2008 data of TUIK sectoral distribution, service sectors take the lead by 61% next to industry with the ratio of 31.5%. Moreover, 99% of business firms of İzmir are composed of small and medium enterprises (SMEs).

Today, many public authorities, NGOs and SMEs struggle to develop ICTs in terms of local economic development and a more qualified urban life. This tendency in İzmir was noted in a recent research report of İzmir Development Agency entitled "Analysis of the Existing Structure" (Figure 4.1).

According to this research sectoral development axis and key sectors are defined by analyzing their capacity of innovation, technology levels, importing exporting ratios.

It is seen that computer based services take place under the new rise sectors and creative industry character. ICT-based sectors are defined as one of the potential sectors in terms of local economy that wait for supporting.

İzmir Strategic Plan for 2003-2012 which was prepared by İzmir Chamber of Commerce is another reference to support the idea of ICT as the most important tool for the local economic development. According to economic sectoral goals, in the period 2003-2012 should be based on *Software Export*. The report defends that this ICT-based service sectors (especially Software, hardware, media, Computer based Services, graphic design etc.) should be supported by local and private authorities such as municipalities, universities, NGOs and private investors.

Sektör Adı	Parlayan Yıldızlar	Yeni Yükselenler	Firma Sayısı Artanlar	İhracatın Türkiye'deki Payın Artanlar	İhracatı Artanlar	İhracatın İthalatı Karşılama Oranı Artanlar	OECD Teknoloji Skalasına Göre Orta-Yüksek Teknoloji Seviyesine Sahip Olanlar	OECD Teknoloji Skalasına Göre Yüksek Teknoloji Seviyesine Sahip Olanlar	Marka Tescillerinde Sektörün Türkiye Genelinde Payı %10'un üstünde olanlar	Endüstriyel Tasarım Tesislerinde Sektörün Türkiye Genelinde Payı %10'un üstünde olanlar	Yaratıcı Sanayi Niteliğine Sahip Olanlar
Gıda ürünleri ve içecek imalatı		X	X	X	X	X					
Diğer iş faaliyetleri		X	X								X
Giyim eşyası imalatı; kürkün işlenmesi ve boyanması		X			X					X	X
Derinin tabaklanması ve işlenmesi; bavul, el çantası, saraçlık, koşum takımı ve ayakkabı imalatı				X	X						X
Kağıt hamuru, kağıt ve kağıt ürünleri imalatı	X		X		X						
Kok kömürü, rafine edilmiş petrol ürünleri ve nükleer yakıt imalatı					X						
Büro makineleri ve bilgisayar imalatı						X	x				
Tıbbi aletler; hassas ve optik aletler ile saat imalatı	X						x			X	X
Geri dönüşüm			X								
Bilgisayar ve ilgili faaliyetler		X									X
Tütün ürünleri imalatı					X						

Figure 4.1: Evaluation of rising industrial sectors (except agriculture)
(Source: İzmir Development Agency, 2008)

İzmir Development Agency's (2008) report asserts that firms that connected each other or compatible services which locate at the same place should be investigated and clustered to cause awareness of each other and supply suitable arenas to study together. In this context, Çankaya/KONAK District is selected as the focus of the case study because of its fame as being IT District including software development, computer hardware services, graphic and media firms (Figure 4.2- 4.3). The identified existing knowledge-intensive service and business in Çankaya show IT capacity of the area. According to research results, 72 knowledge (knowledge generator based) intensive firms were determined around Çankaya.

The accumulation area of the firms is bounded by main vehicular access roads. This boundary gives a diamond shape to the area. Thus, the accumulation area of the

firms is defined as inner city technology precinct and named as "İzmir Technology Diamond" because of its shape (Figure 4.4). Moreover, it is observed that some areas have technology hotspot character around Şair Eşref Boulevard and 1362 Street through individual office buildings (Figure 4.5).

Figure 4.2: Administrative Districts of İzmir

Figure 4.3. Location of Çankaya District

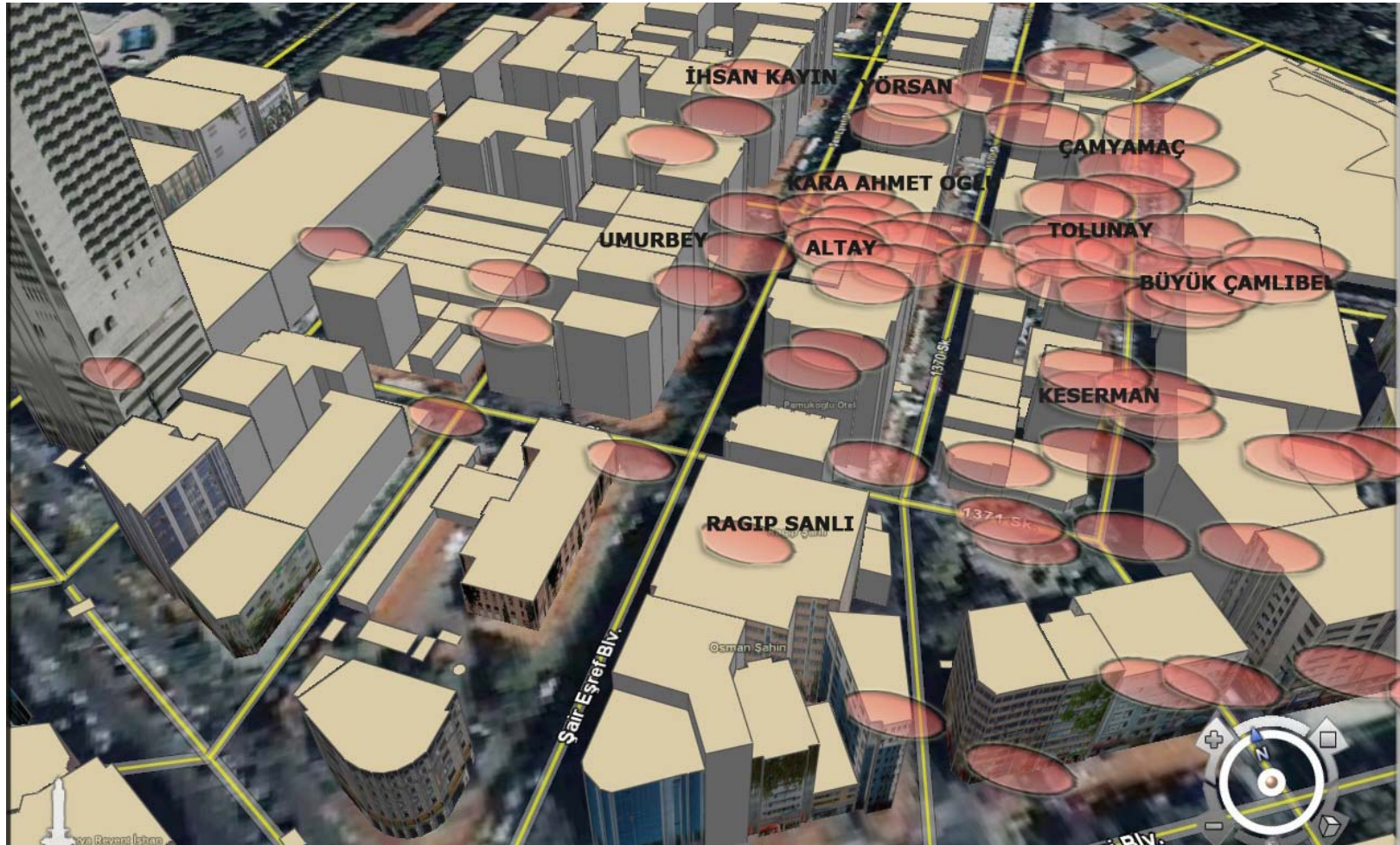Figure 4.4. İzmir Technology Diamond and Hotspot Areas

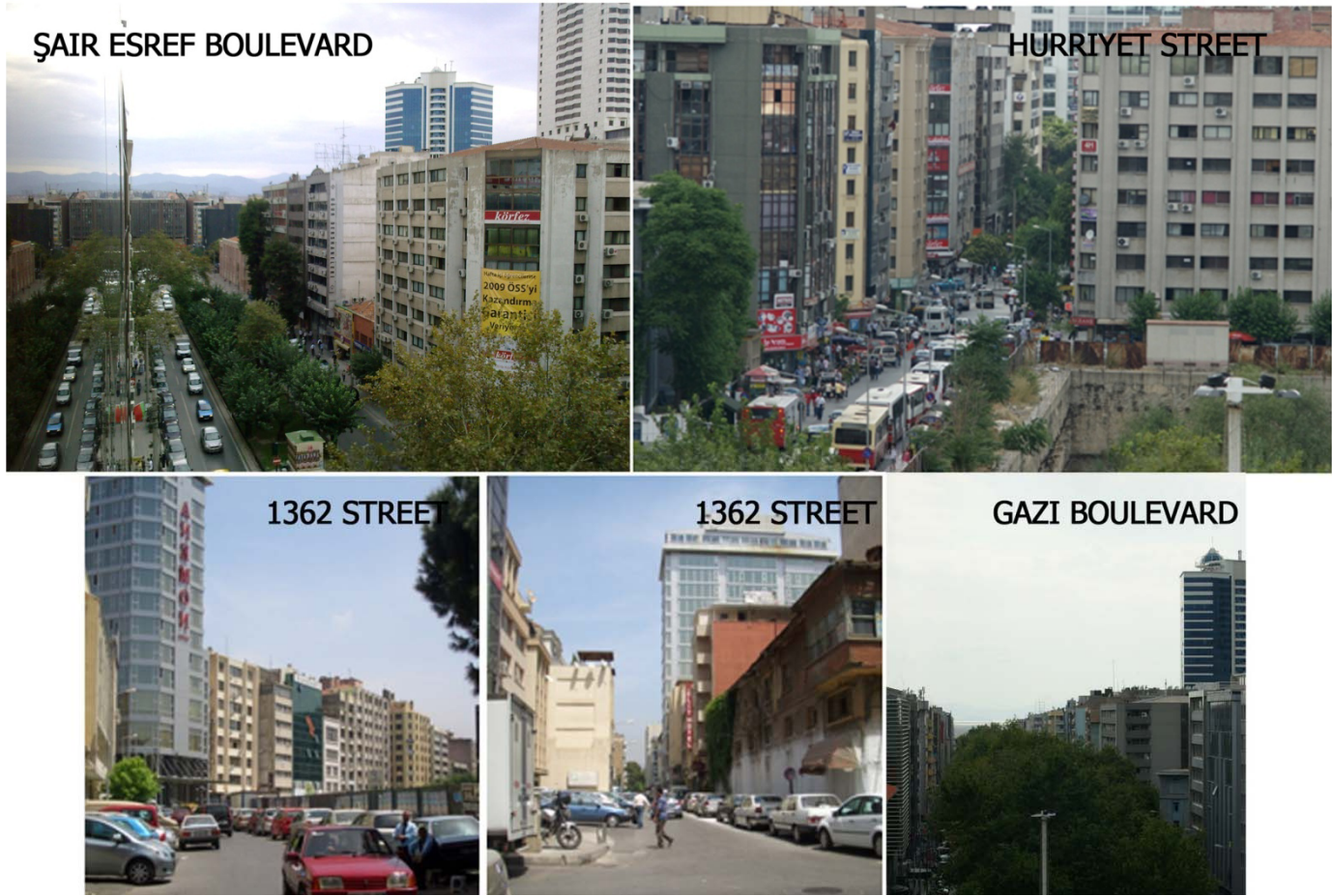Figure 4.5. Location of Individual Office Buildings including Knowledge Intensive Firms

Figure 4.6. Office Buildings of the area

İzmir Technology Diamond area and near environment were formed after 1922 İzmir fire according to French architects Rene and Raymont Danger's 1925 plans. The main radiant axis and squares as Gazi Boulevard, Dokuz Eylül, Cumhuriyet, and Montrö Squares were formed by this plan (Figure 4.7).
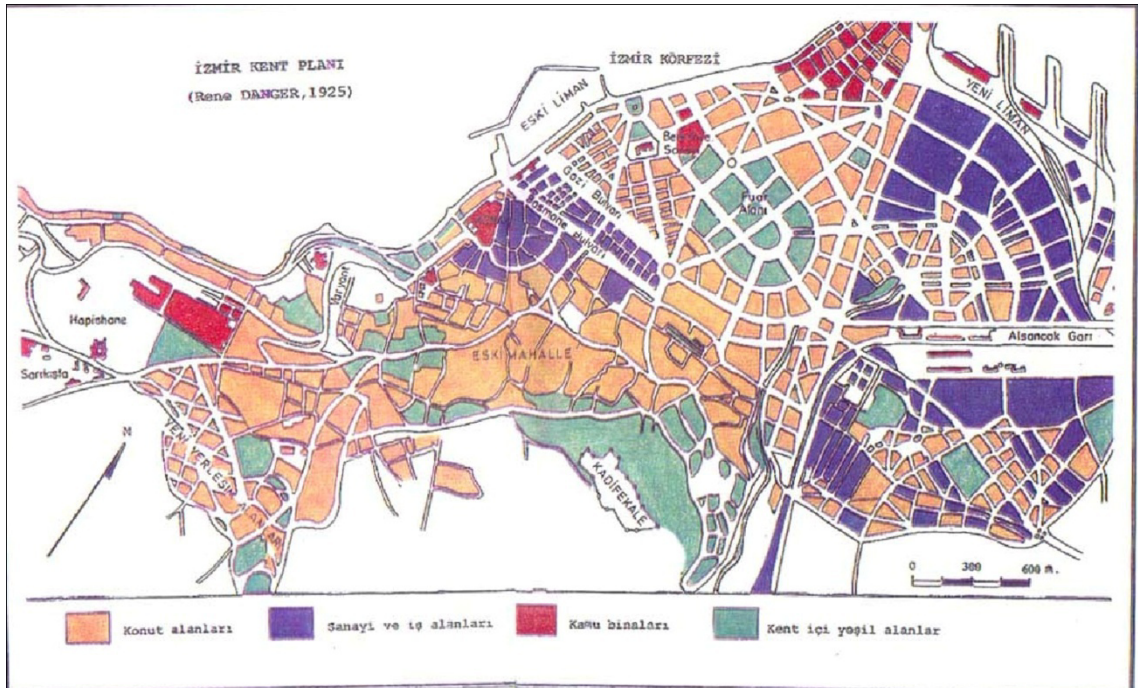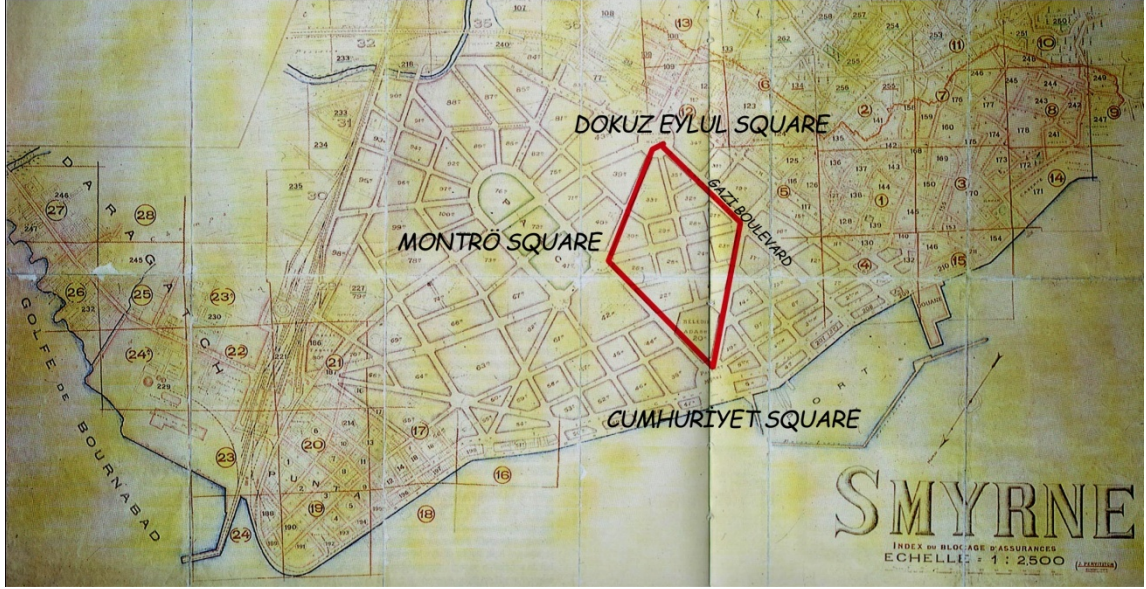

Figure 4.7. Rene and Danger Plan
(Source: İzmir Konak Municipality Archives)

Although the spatial character of the area was defined as residential in this plan, after 1955 plans, functional character of the area turned to central business district that include office buildings, commerce, accommodation, cultural and social facilities.

4.3. Research Framework

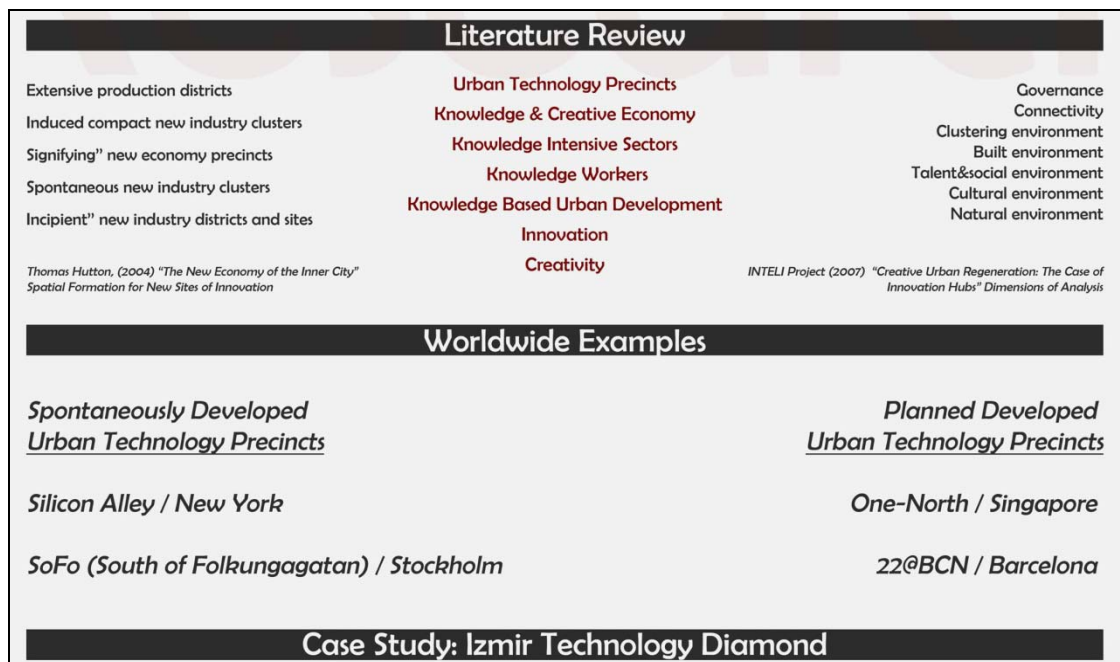The research framework used for this study is as follows:

Figure 4.8. Conceptualization of Research Framework

- Gathering general information about key points as urban technology precincts, knowledge and creative economy, knowledge based urban development, knowledge intensive sectors and knowledge workers, innovation, creativity are investigated for literature review over books, articles, periodical and academic publications, web sites.

- Establishment of a set of dimensions of analysis from the research named Creative Urban Regeneration: The Case of 'Innovation Hubs 'of INTELI and Thomas Hutton's' spatial typology to understand main characteristics of new urban technology precincts.

- Analyzing worldwide planned and spontaneously-developed UTP examples to define general characters and spatial organizations of them.

- Construction of a system of indicators for Çankaya/İzmir-Turkey case area which is a start-up example of organic urban technology precinct named as İzmir Technology Diamond and Şair Eşref Boulevard, 1362 Street which is a start-up example of hotspot, and extraction of conclusions. The empirical work was based on the collection of bibliographical elements, direct observation and field interviews.

General characteristics of SDUTPs make up the decisive framework for the Çankaya/İzmir case. These seven foundations features are indicated in Table 4.1 and Table 4.2.

Table 4.1: General Characteristics of Spontaneously-Developed Urban Technology Precincts
(Source: based on INTELI, 2007)

COMMON PROPERTIES	SPONTANEOUSLY DEVELOPED	CHARACTERISTICS						
	2	GOVERNANCE	CONNECTIVITY	CLUSTERING ENVIRONMENT	BUILT ENVIRONMENT	TALENT & SOCIAL ENVIRONMENT	CULTURAL ENVIRONMENT	NATURAL ENVIRONMENT
		* Market-Centered System * Bottom-Up Approach	* Locating at Central Business District * Walkable distant * Virtual Connectivity	* Knowledge and creative intensive sectors	* Infiltration Based * Mixed-use (Working-Living-Learning-Playing) Environment * Interactive environments, * Proximity to business and service sectors	* Qualified human resources * Knowledge and creative workers * Diverse and multicultural environment * Social networks	* Existing Cultural blend * Distinctiveness and unique identity ('Genius loci') * Cultural and entertainment facilities * Vibrant and inspiring life	* Developing Potential Assets * Creating Environmental quality

Each of these seven foundations refers to a state of existing potentials and represents the case areas' ability to being SDUTP and hotspot. They also show the urban pattern, existing functions and sectors and identity of the area besides creating, disseminating and using knowledge and creativity for economic growth. Each of the seven foundations' relevance to the basic properties of new economy and their measurement methods are explained below.

Table 4.2. Characteristic Features of Spontaneously-Developed Inner-City Technology Precincts

CHARACTERS	DIMENSIONS	SUB-DIMENSIONS	RESEARCH TECHNIQUES
GOVERNANCE	Bottom-Up Approach	Number of outstanding individual knowledge intensive companies	Survey Interview archives
		Number of years that locating in the case area	Survey Interview archives
		Relationship with international firms	Survey
	Market-Centered	Existing regulations and policies	Archive
		Existing associations and NGOs	Archive
CONNECTIVITY	Central Business District	Creative and knowledge intensive spaces around the area	Check-list
		access to jobs and key services	Observation Check-list
	Ease of Access	Transportation modes of the area	Observation archive
		Access to Airport, Port	Observation archive
		Customer Access to firms	Observation Survey
	Seamless Connectivity	Presence of suitable IT infrastructure	Survey Interview archives
		Number of firms which have e-services	Archive
		Existing investments for IT networks	Archive interview
		Possible investments for IT networks	Archive interview
CLUSTERING ENV	Knowledge and Creative Intensive Sectors	Interrelationships of firms with each other	survey
		Work field of firms and the ratio	survey
		Relationships with corporations and universities	survey

(Cont. on next page)

Table 4.2. (cont.)

BUILT ENV.	Infiltration Based	Ratio of dissemination of IT based firms in the areas	Survey
	Gradually Active Mixed-Use (Work-Live-Play) Environment	Existing land use policies comes from plans	Archive
		Intrinsic land-use on area	Observation
	Perceptual and Architectural Branding Identity	Presence of Distinctive, branding Places, buildings	Observation Survey Interview Check-list
		Mix-use building ratio	Observation Check-list
		Urban Furniture	Observation
TALENT&SOCIAL ENV.	Qualified and talented knowledge and creative workers	Percentage of Knowledge and Creative talents (Youth, students)	Archive
		Presence of Universities	Archive
	User Friendly Physical Environment	Number of gathering places	Observation
	Social Networks	**	
CULTURAL ENV.	Distinctiveness and unique identity ('Genius loci')	Existing popular, known architectural building or an area.	Observation Survey Check-list
		Existence of historical heritage and historical building	Observation Survey Check-list
	Cultural and Entertainment Facilities	Existence entertainment facilities such as cinemas, theatres, open theatre etc.	Observation Survey Check-list
	Vibrant and Inspiring Life	Cafes, restaurants, bistros, pubs around the case areas	Observation Survey Check-list
NATURAL ENV.	Natural Environment (landscape, park, greenery)	Consistence of landscape and open space usage	Observation Check-list
	Natural Environmental Quality	Efficient usage of open spaces**	Observation Check-list

All of these indicators are definitive to evaluate the case area in terms of having potential to be a SDUTP. In the process of assessment, we used qualitative research techniques such as observations, checklist, and interviews. Additionally, to obtain quantitative data we utilize archival data from Turkish Statistical Institute, NGOs and professional associations.

On the other hand, to evaluate the knowledge capacity of the firms, a valuation framework was prepared illustrating the three main categories as *Creative Suppliers, Technical Service, and Distributer* (Table 4.3).

Table 4.3. Valuation Framework of Knowledge intensive firms

CATEGORY	EVALUATION CRITERIA	VALUE
CREATIVE SUPPLIER	Knowledge Generators	3
TECHNICAL SERVICE	Knowledge Users	2
DISTRIBUTER	Knowledge Disseminators	1
TOTAL		6

Under Creative suppliers category, software based firms that study on software systems and generate software database by their own, graphic design, media and web design and advertisement based firms are taken. This category is considered as the most important and valued as the highest (3) in the score sheet. In the study only the creative suppliers were chosen for evaluation of knowledge capacity.

The second category is defined as technical services or supporters. Since technical service need computer based knowledge we qualify the firms over their talented employees. This category evaluated as the second highest (2) in the score sheet.

The last category contains distributers. Distributers are importing or exporting of hardware or software systems. This kind of a firm cannot need any extra knowledge except giving technical service. Therefore, distributers takes the lowest score (1) in the score sheet.

According to this knowledge capacity valuation, most of the creative supplier firms take place on Şair Eşref Boulevard and 1362 Street. They prefer locating in office buildings. As a conclusion, Şair Eşref Boulevard was the best example for the study with its hotspot character by including many ICT based SMEs. On the other hand, diamond shaped area named "İzmir Technology Diamond" has SDUTP character with covering all work, live, play concepts besides having unique identity.

With this regard, a diamond-shaped area which is surrounded by Gazi Boulevard, Cumhuriyet, Montrö and Dokuz Eylül squares, is anticipated to have a SDUTP character (Figure 4.9). "İzmir Technology Diamond" is selected for detailed investigation.

It takes place at the strategic point of inner city İzmir. It is a transition point for two main commercial zones as Konak and Alsancak. Proximity of İzmir Harbor is another supportive point.

Figure 4.9. Accumulation of Knowledge intensive firms in İzmir Technology Diamond

In the process of interviews 20 of 72 knowledge-intensive firms were selected according to their knowledge capacity as being creative suppliers. Interviews were conducted between 27.04.2010 and 10.05.2010. The 20 selected firms' are given in Table 4.4.

Table 4.4. Selected Knowledge Intensive Firms for Face-to-face Interviews

Selected Knowledge Intensive Firms	Location
Ceyhan İletişim Sistemleri	1362 Street
Akel Otomasyon	1362 Street
Mikroteksis	1362 Street
Mikrodata Bilişim Teknolojileri	Şair Eşref Boulevard
Egetek	Şair Eşref Boulevard
Pusula Bilişim	Şair Eşref Boulevard
Destan Telekom	Şair Eşref Boulevard
SBA Reklamcılık	Şair Eşref Boulevard
Destek Bilgi Sistemleri	Şair Eşref Boulevard
Arce Yazılım	Şair Eşref Boulevard
ADS yazılım Komart Bilgi Teknolojileri	Şair Eşref Boulevard
Diyez Yazılım	Şair Eşref Boulevard
Niobeweb	Şair Eşref Boulevard
4M yazılım	1362 Street
Bilgi Tasarım reklam	1362 Street
CTS Yazılım	Şair Eşref Boulevard
Univera	Şair Eşref Boulevard
Aura Bilişim	Şair Eşref Boulevard
Sınırsız Bilişim	1362 Street
Yapay Zeka	1362 Street

Interviewers were selected mostly from employers of firms. These contacts were willing to participate in the interview as this field of study (ICT) has recently flourished in İzmir and Turkey.

The structure of the interview was built upon to designate the duration of existence of firms in the area, their ownership and dwelling floor, number and qualification of employees, location choice, international and local relationships and problems of the area. Each of these topics entitled provides brief and precise data to generate an assessment framework for possible interventions and opportunities.

4.4. Assessment of the Case Area

In this part, potential possibilities of the case study area in terms of having SDUTP and hotspot characters are examined. The area examined according to seven

dimensions as governance, connectivity, clustering, built, talent and social, cultural, natural environment (see Chapter 3).

4.4.1. Governance

Bottom-up approach of the firms is the first characteristics issue of spontaneously-developed technology precincts. In this part number of outstanding individual knowledge intensive companies, number of years that locating in the area and the international relationship are the main data. On the other hand another supportive criterion is existing regulations and policies.

According to case study research, 45 of 72 knowledge intensive firms around Çankaya District are located at the İzmir Technology Diamond. While 18 firms tend to locate in Şair Eşref Boulevard, 20 of them locate at 1362 street. The locating duration of the case area is classified according the peak period that ICT firms tend to increase for both Turkey and İzmir. 1990s is the peak period that ICT terms started to be well accepted and the number of knowledge intensive firms gradually increased. Because of that reason, the classification is done as before 1990, 1991-1995, 1996-2000 and 2001+. 2000 is the second peak point because of the mentioning millennium and innovation period. According to results although before 1990 (Figure 4.10) any firm tend to locate in the case area, after 2000 it is seen an incremental increase. The firms show that founding of first distributers, technical services in the case area was the main reason of that.
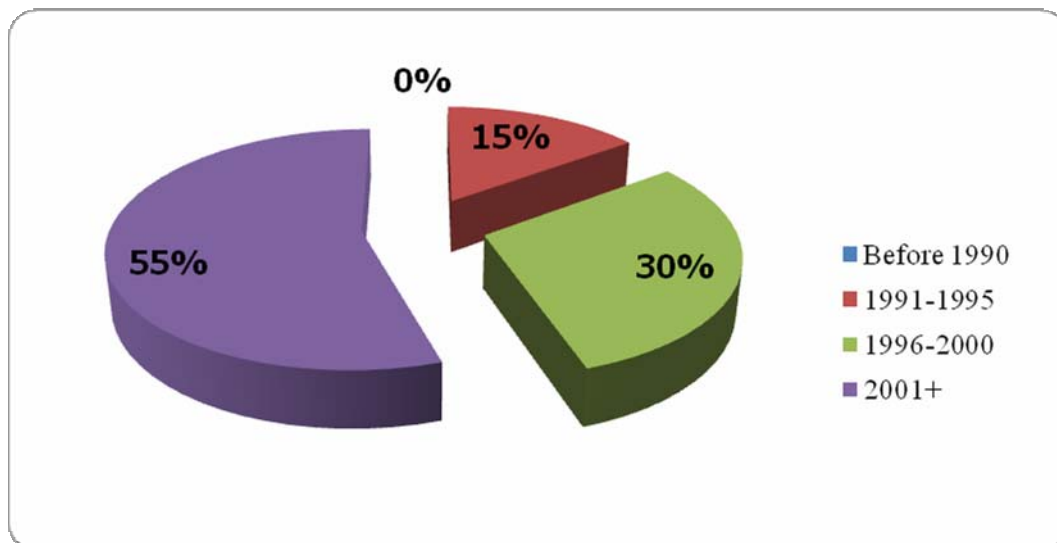

Figure 4.10. Ratio of the Existence in the Case Area

When we examine the local and international relationship, international relation is weak for now due to insufficient recognition of the selected 20 firms. On the other hand, most of them have strong local relations only İzmir, Aegean Region and nationwide (Figure 4.11 - 4.12).
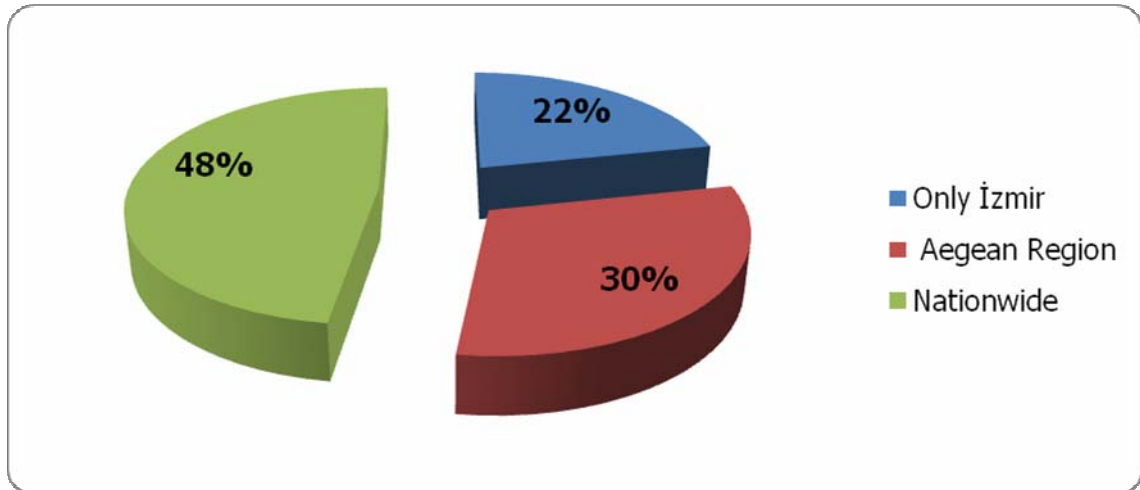

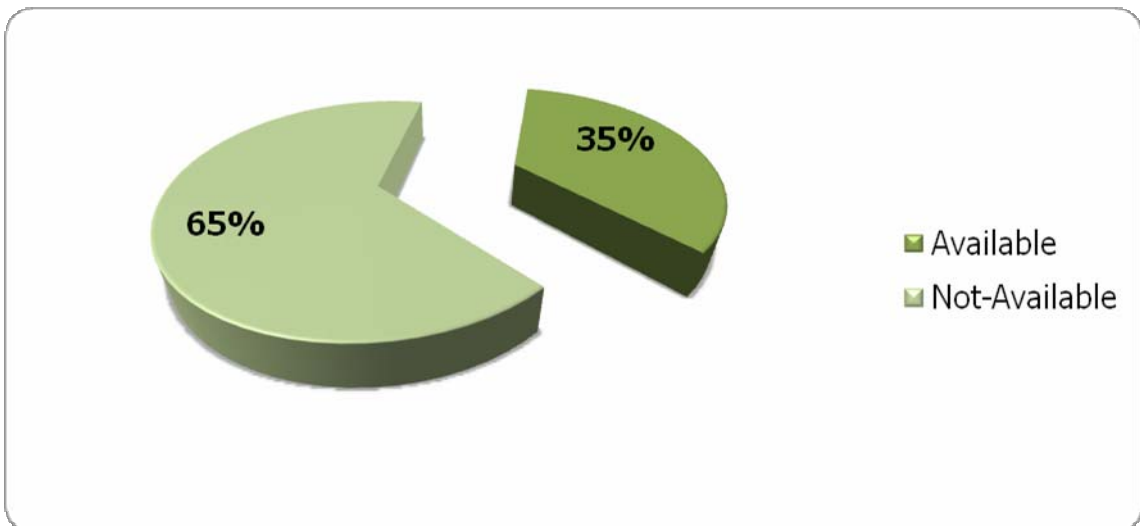Figure 4.11. Existence of the Local Relationship

Figure 4.12. Existence of the International Relationship

In Turkey existing regulations and policies are shaped around master plans. These plans are classified as upper and lower scales. All urban areas depend on these plans. İzmir Technology Diamond is an area that its planning history goes beyond early 1900s. The existing regulations for the area can be classified as 1/25000 scaled Environmental upper plan (Figure 4.13), 1/5000 scaled İzmir 1st Stage Alsancak-Kahramanlar Region Master Plan (Figure 4.14), and 1/1000 lower scaled plan (Figure 4.15). However for all plans the area is defined as the significant part of İzmir's Central Business District. According to plans, in terms of functional structure, there will be commercial, institutional, educational, healthcare, office, cultural and also residential areas can be taken place. This is the most supportive foundation for the character of being qualification of urban precinct.
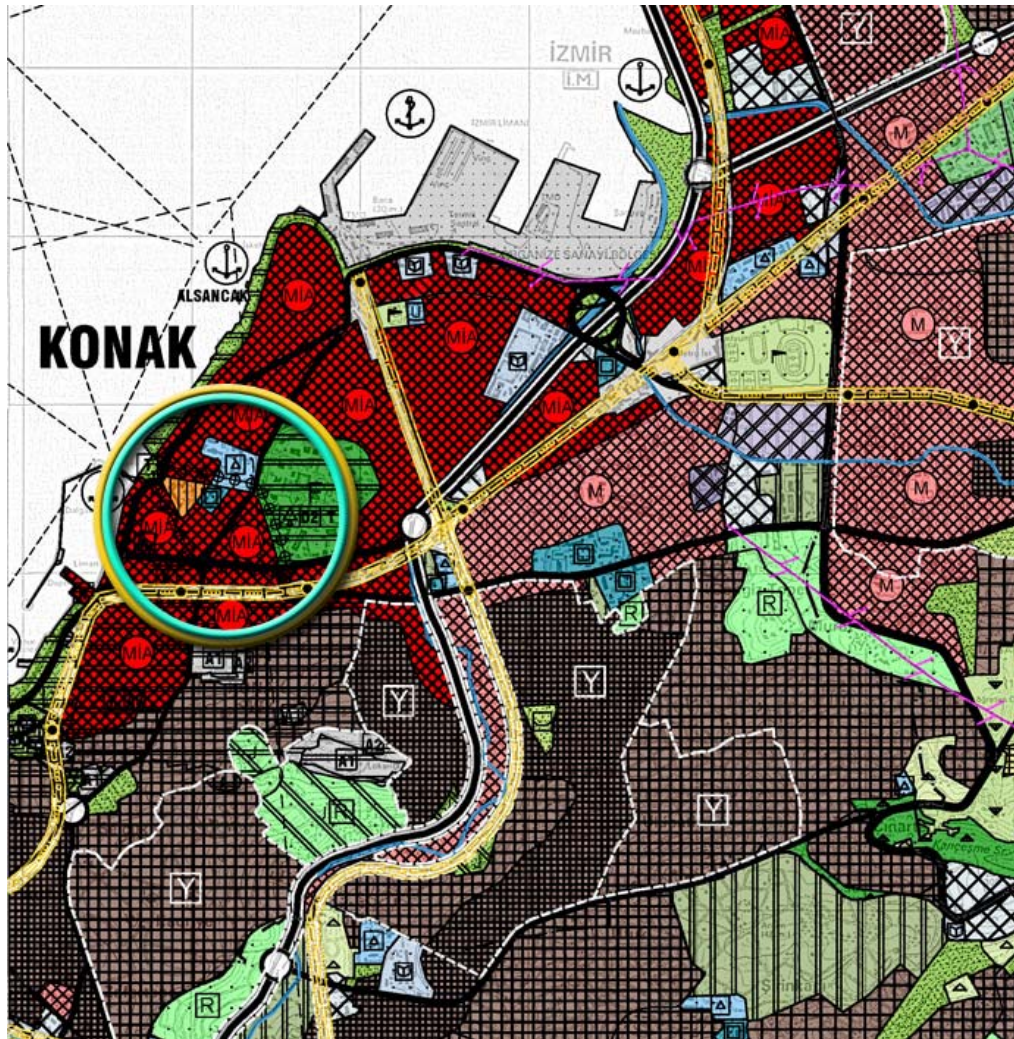

Figure 4.13. 1/25000 Scaled Environmental Plan approved at 11.11.2009
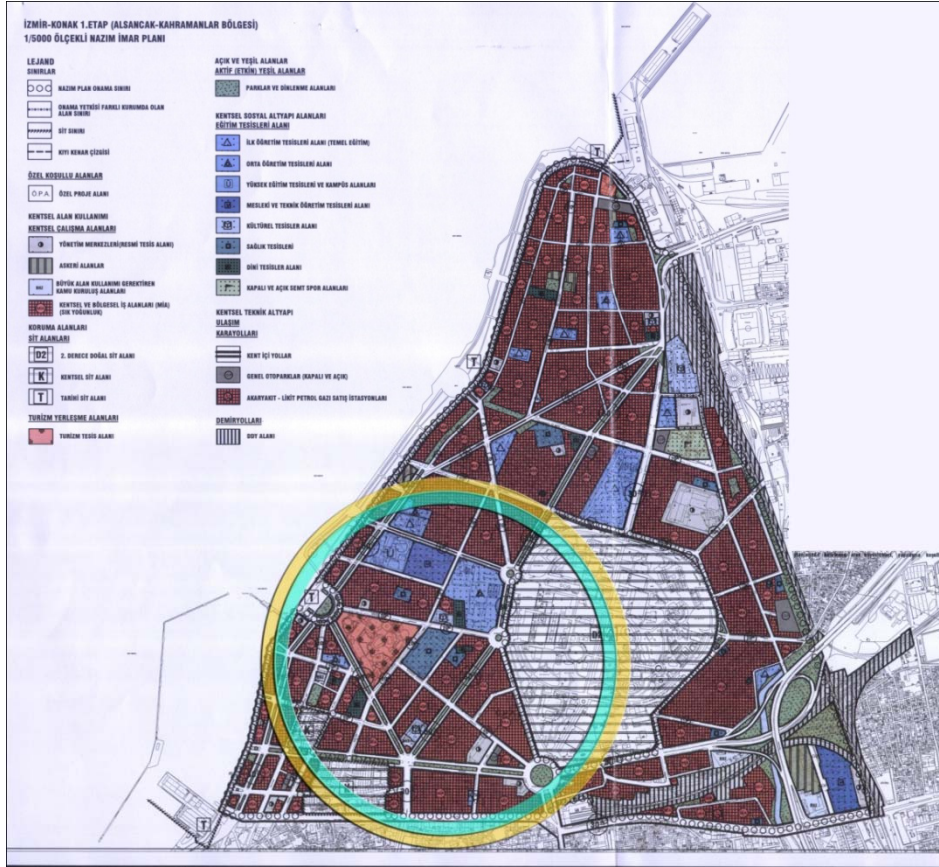(Source: İzmir Metropolitan Municipality Archive)

Figure 4.14. 1/5000 Scaled İzmir 1st Stage Alsancak- Kahramanlar Region Master Plan approved at
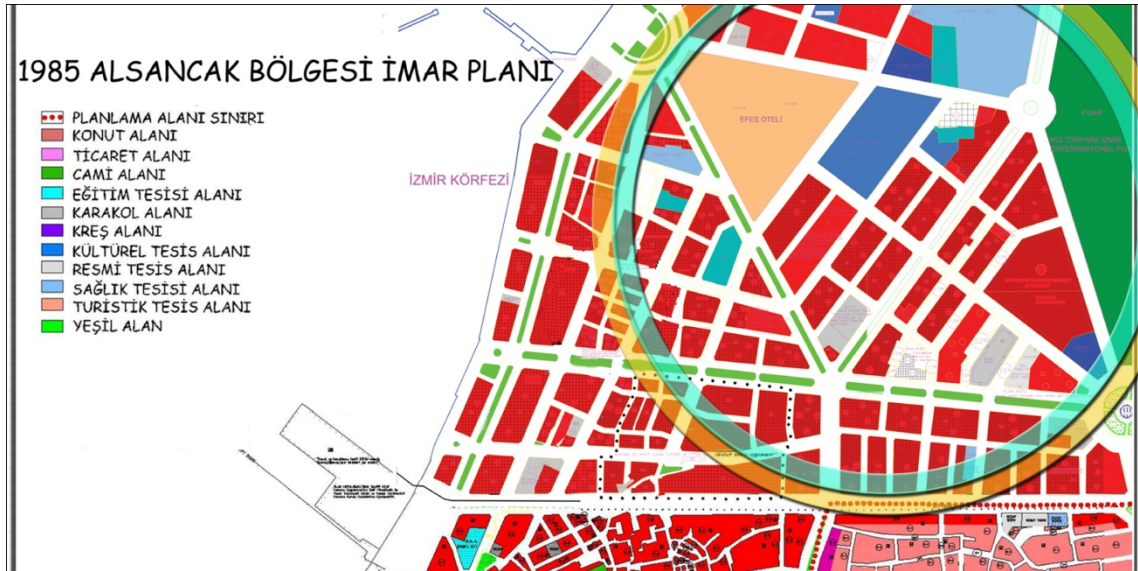12.03.2010 (Source: İzmir Metropolitan Municipality Archives)

Figure 4.15. 1/1000 Scaled Master Plan approved at 1985
(Source: İzmir Konak Municipality Archive and numerical data)

Last criterion for governance is the existing associations and NGOs those firms
enrolled. Interview results show that most of the firms do not enroll any associations

that interested in ICT-based small and medium entrepreneurships as Turkish Electronics Industry Association (TESID), Turkish Industrialists and Businessman's Association (TUSIAD), Turkish Informatics Endowments (TBV), Turkish Electronics & Information Industries Association, TUBIDER IT Sector Association, TUBISAD Informatics Industry Association. However, they all are the members of İzmir Chamber of Commerce. Some interviewees said that knowledge intensive firms do not see themselves as SMEs because of the fact that ICT firms cannot benefit from opportunities of SMEs such as fund, prompting policies.

Consequently, there is an inevitable potential in terms of knowledge based business and service sectors in İzmir Technology Diamond. The existing policies and local authorities are encouraging facts to develop both the structure of firms and also the built environment of the area. The absence of international relationship can also be traced back to new generation of the knowledge intensive firms for both the case area and İzmir especially after 2000. However, it can be said that local relations of ICT based firms are strong, so this can be proof of the business network between knowledge generator, disseminator and user.

4.4.2. Connectivity

İzmir Technology Diamond is located in a central part of İzmir between Konak, Alsancak, Bornova and Kemeraltı and it is surrounded by main transportation roads (Figure 4.16). Besides, technology hotspot Şair Eşref Boulevard is the main transportation artery between Alsancak and Çankaya. The area take place at the middle of the access points in terms of vehicular as port, train station, subway stations, bus stations and also pedestrian circulation with main squares of İzmir (Figure 4.17).
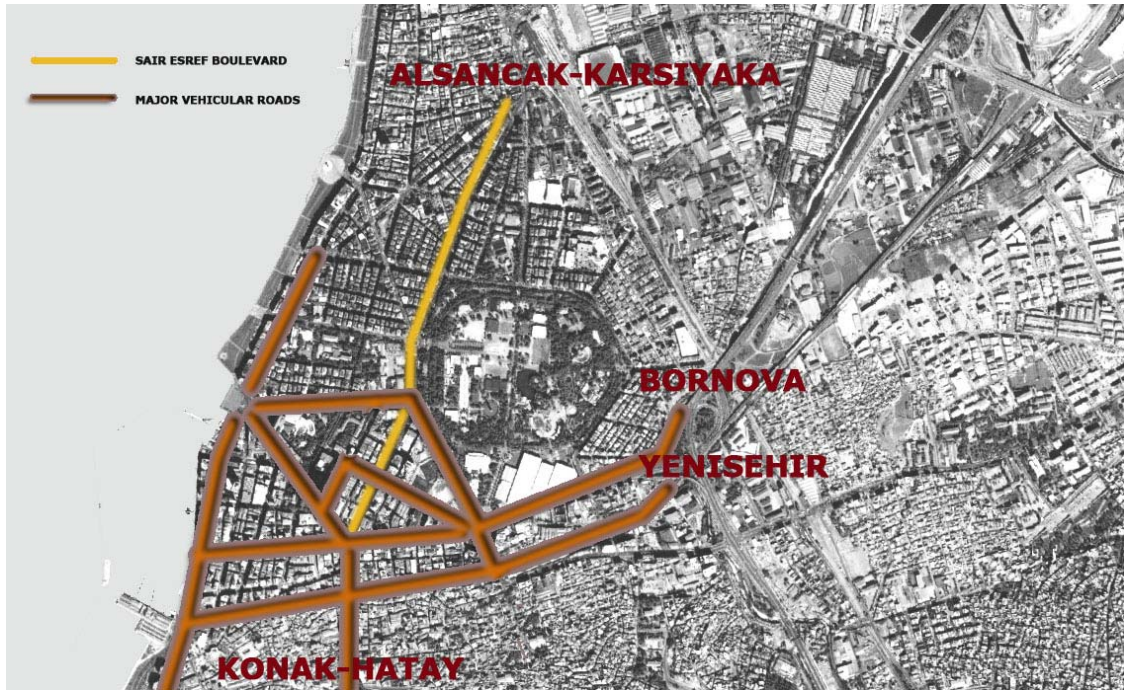
Figure 4.16. Proximity to Surrounding of the Case Area

Figure 4.17. Transportation Network around İzmir Technology Diamond

While the only knowledge intensive area is the Şair Eşref Hotspot area, the creative intensive area can be Mimar Kemalettin Fashion district. Proximity to airport only supplied by buses or by using train. However, according to interview results, knowledge intensive firms do not need air transportation for importing or exporting. Accessibility to their jobs is easy because of the multi-modal transportation opportunities.

Seamless connectivity is another key point for knowledge-intensive firms to connect to a virtual network. Although there is a wireless connection, speed is not as expected. They experience network problem sometimes. It causes main problems because of absence of connection to their e-services. This is important because their customers tend to reach them by their e-services and also it is mostly important especially for creative suppliers. Today, there are many investments for local authorities to IT in İzmir. Fiber optical connection is tried to be supplied. This can be an advantage for the development of the hotspot and precinct character of the area. At last we examine customer access to firms under the heading ease of access. The aim is to clarify that face to face communication is still important or not, or wireless access is enough. First of all, it is observed that ICT based firms tend to locate generally upper floors of office buildings (Figure 4.18).
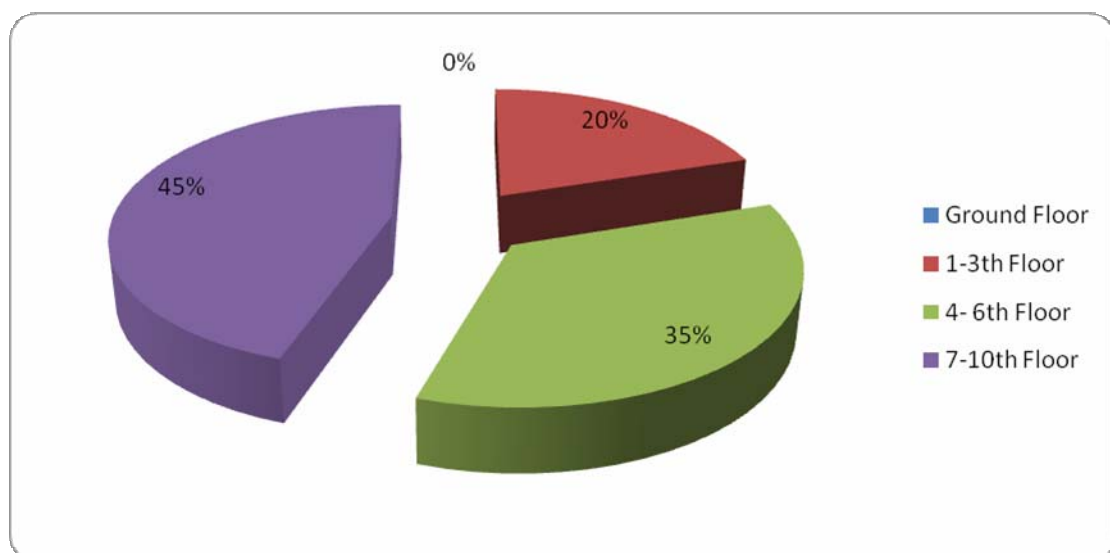

Figure 4.18. Dwelling Floor Results of the Firms

Tendency to locate in upper floors is the general character of the firms. The results of this can be interpreted as; not willing to disturb, opportunity to go customers with all employees at sudden occasions, reject having a retailer identity. Especially creative supplier based firms tend to locate upper levels because of the need for silence.

4.4.3. Clustering Environment

The aim of the examining clustering environment is to define relationships of knowledge based firms with each other. Interview results suggest that there is a strong relationship between main hardware distributer and creative suppliers. They need each other. Besides, for some firms' technical service supporting of other firm is an essential issue. Being business partner is another approach for the firms. For instance a firm that makes software programming agreed with another firms that supplies web design opportunity. They start working together even one of the firms far away from the case area. On the other hand, a firm that is both creative supplier and distributer of its product. Firms tend to prefer locating two places. One of them is used for software design and the other location is used for marketing the product. At this point, Şair Eşref Hotspot is a suitable place for the marketing their own product because of being in inner city and near to users and disseminators. For software design branch some firms tend to locate at the İzmir Technology Development Zone (IZTEKGEB) within the boundaries of İzmir Institute of Technology.

4.4.4. Built Environment

While Şair Eşref Boulevard and 1362 Street appears as a technology hotspot, it does not mean that the only areas in terms of knowledge intensive firms for preference to locate. As it can be seen easily in part 4.2, knowledge firms disseminate to whole area. This infiltration gives the identity of the urban technology precinct character to the area. Hotspots mean accumulation point of the firms. When we look at the existing land use decisions, the area consists of mainly mixed- use commerce, accommodation, residential, institutions, healthcare, education, religious buildings.

Unity of this compatible uses blazes gradually active, live and diversity environment. Concentrated facilities form the main character of inner city technology precincts. İzmir Technology Diamond is suitable for gathering *Living, Working and Playing* (Figure 4.19). There are five main listed buildings in the area as historical fire station that use as City History Museum today, abandoned historical Atlas Hotel, historical Church, monopoly building and Behçet Uz Child Hospital. These historical

areas add an extra urban identity to the area. In terms of distinctive and branding places, Cumhuriyet, Dokuz Eylül, Montrö Square, Hilton and Efes Hotels, Sevgi Pedestrian Road. On the other hand Şair Eşref Boulevard has won branding with ICT based firms. The area known as IT based street.
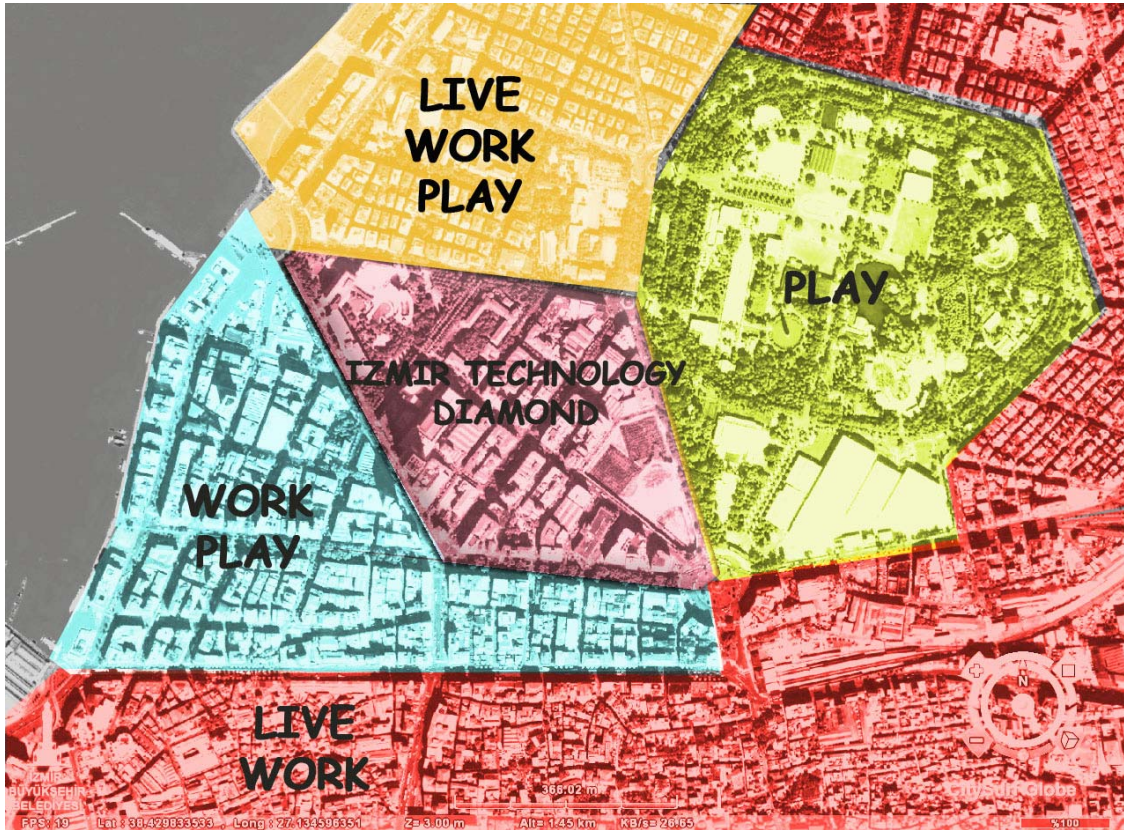

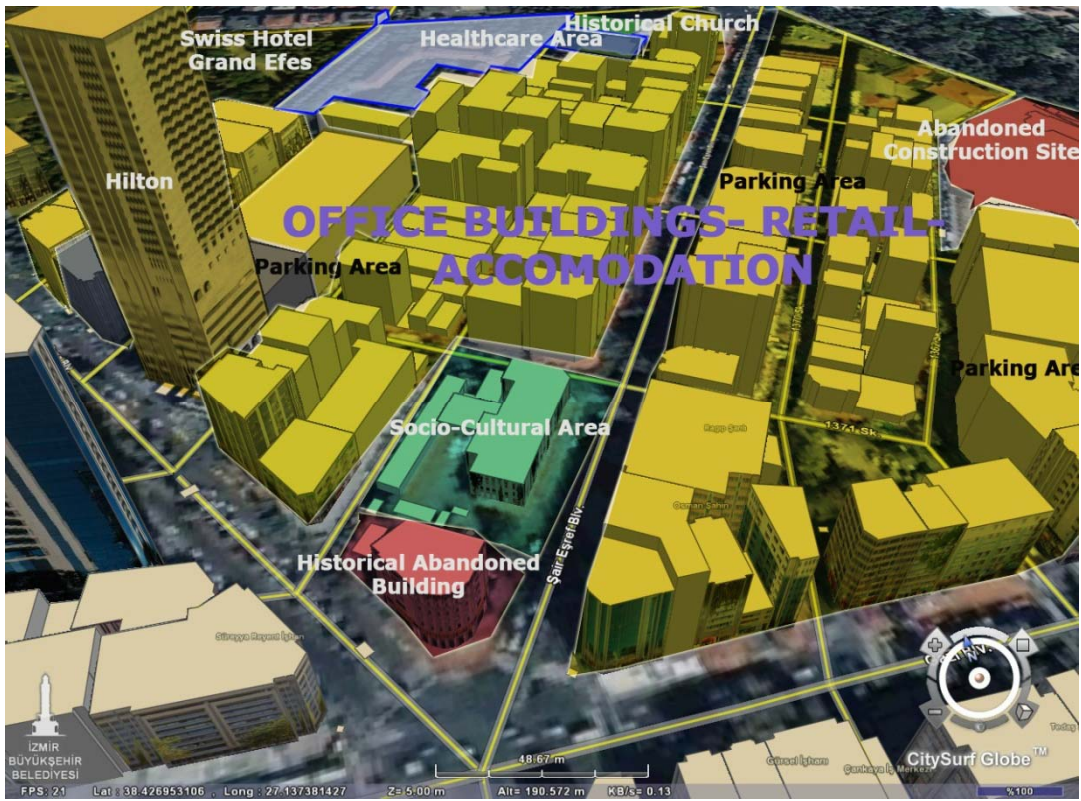Figure 4.19. The Main Concept of the Inner City Technology Precincts

Figure 4.20. Existing Land-Use

Figure 4.21. Interaction of the area with other uses

Figure 4.22. Distinctive and Branding Places

Location of the area, its diversity and consistence of mix-uses is the key point for business and service sectors in their location choice. Proximity to every usage is an advantage for them in terms of time efficiency. Besides, proximity of knowledge generators, technical services, distributers is another advantage.
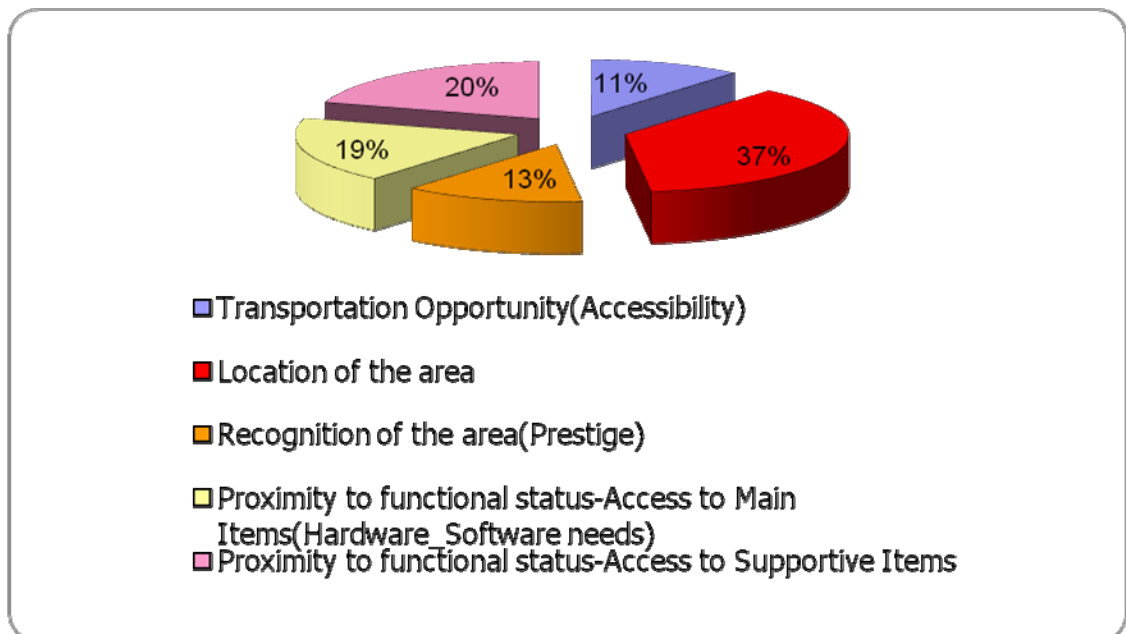

Figure 4.23. Reason of Location Choice

Although İzmir Technology Diamond is chosen because of its location (Figure 4.23) and diversity and identity, parking area is an essential problem for the firm employees who tend to arrive by cars. Existing main bus stop area is another limiting point for car parking due to their diversity. Another problem is construction site (Figure 4.24) in terms of its visual pollution. Identical potential of the area is ignored and the main reason is insufficient advertisement.

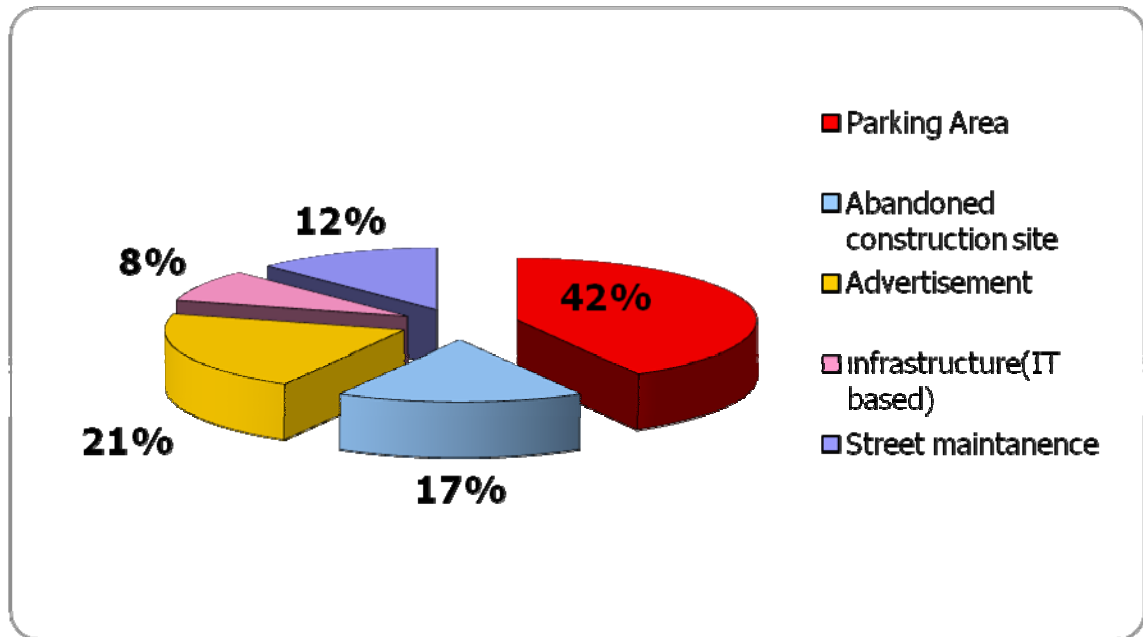Figure 4.24. Abandoned Construction Site

Figure 4.25. Problems of the Area

Consequently, built environment of the area is efficient to develop area character and its identity to supply branding. Variety of the functions around office buildings causes efficient usage opportunities for employees. Besides proximity to main distributers and technical services is the main reason for locating in the case area. As it is mentioned in Chapter 3, both urban precinct and hotspot character takes place in the mix-use environment that has opportunity for work-live-play-learn is main foundation.

4.4.5. Talent & Social Environment

In terms of talent and social network, quality of the knowledge workers is important. However, in İzmir Technology Diamond, we could not reach the percentage of knowledge & creative talents. We just reach educational status of interviewers. According to survey result, it is seen that all employees in 20 firms are university graduate. In this classification, we take also technical high school graduates (Figure 4.26). Another important point was number of employees (Figure 4.27). In knowledge intensive firms because of working by wireless network, they do not need many employees. Maximum employee number is 11.

Although, ICT based firms have connections with each other, they do not prefer to gather together in their leisure times as in technopark models. Sometimes, they tend to gather at lunch times or informatics based events as fairs, conferences.

To evaluate employees weekly activity network is prepared over chosen five creative supplier firms. Their weekly activity pattern is asked. Activity mapping give the most active places in terms of commerce, healthcare, cultural, gastronomical facilities beside most popular transportation mode (Figure 4.28).
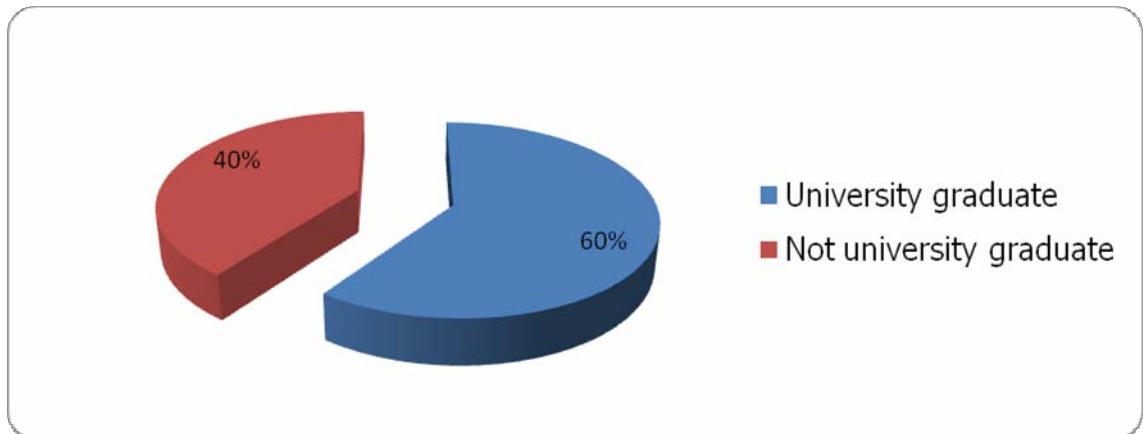

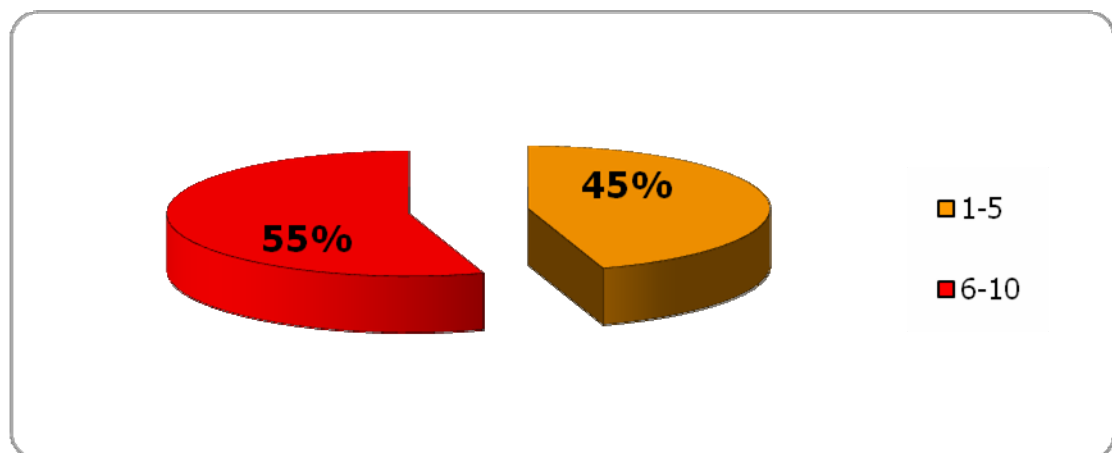Figure 4.26. Qualification of Employee
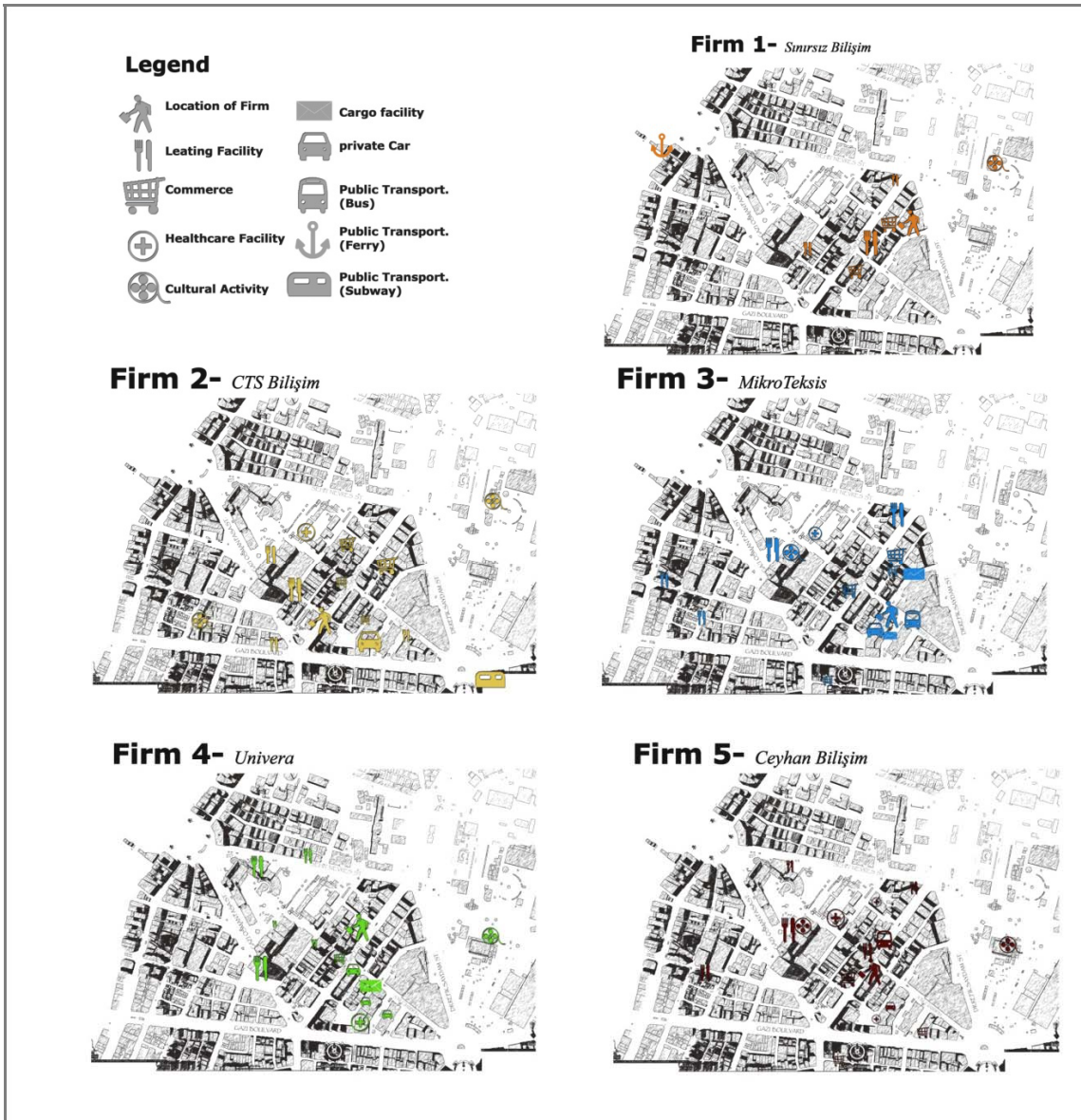

Figure 4.27. Number of Employee

Figure 4.28. Activity Mapping

Figure 4.29. Places that actively used

According to activity mapping for five knowledge intensive firms, especially Sevgi Road is chosen for eating facilities; Commercial choices are shaped around main distributer of Arena and Index companies. Moreover, in terms of healthcare facility they mostly prefer İzmir County Health Management. On the other hand, entrance of Şair Eşref Boulevard, around Atlas Hotel and other construction site is the inactive places because of their abandon. Employees that attended survey prefer private vehicles for accessing their job. For cultural activities they prefer Ismet Inonü Culture Center and İzmir Sanat that locate in Culture Park. Preferring private transportation cause insufficient parking areas, even according to survey answers the main problem of the area is car parking. On the other hand, abandoned construction site causes visual pollution.

4.4.6. Cultural Environment

Şair Eşref Hotspot is a transition point between two main centers Konak and Alsancak. This makes the area live. On the other hand having most known accommodation places that are also popular architectural buildings with cultural facilities supply frequented place character. Skyline of the area shaped with high rise office buildings and hotels. However, elevation is active because of three-four floored buildings between seven-ten floored cubic buildings. Moreover listed buildings add an extra rituality to its architectural identity. On the other hand, it acts like compact urban structure. Cafes, restaurants, pubs that surround area cause a vibrant and inspiring day and also night. In spite of insufficiency of cinemas and theatres, cultural facilities of Culture Park are supportive items for area. Locating in the center of two main central business districts like Konak and Alsancak and connection with Kordon and Pasaport promenade has many advantages in terms of leisure times of the employees and citizens in their daily life. Accommodation areas such as Swiss Hotel Grand Efes, Hilton Hotel and so on, are supportive functions of vibrant 7/24 urban life in the area.

Figure 4.30. Vibrant Life of the Case Area

Figure 4.31. Areas that contain Catering Services

To sum up, cultural environment of the area sustain lively 7/24 day life. This property supplies active work life for employees that take in place. On the other hand, vacant historical buildings such as Atlas Hotel, Monopoly Building and abandoned construction site of World Trade Center have potential to consider for socio-cultural, accommodation and also retail facilities.

4.4.7. Natural Environment

Around the İzmir Technology Diamond, the most nearest greenery place is Pedestrian Street named Sevgi Road. It is used actively by citizens. On the other hand, proximity to Culture Park and Kordon Promenade sustains need of natural environment. Culture Park is wide recreational area. The area is used actively because of having retail, cultural facilities beside natural environment.
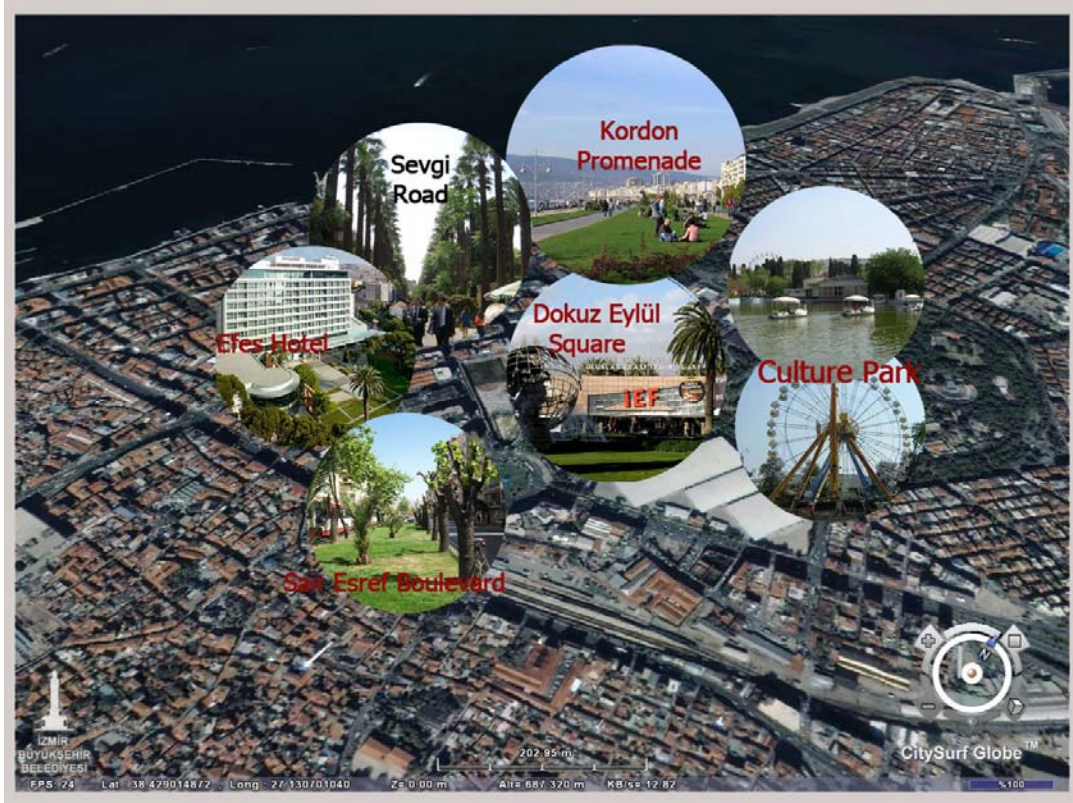
Figure 4.32. Natural Environment around İzmir Technology Diamond

4.5. Summary

İzmir Technology Diamond was selected because of its familiar properties with worldwide SDUTP examples. By its ICT and media based infrastructure it is similar to Silicon Alley besides, including creative and vibrant environment it looks like SoFo. Case study results illustrated that İzmir Technology Diamond has unignorable potential. Şair Eşref Boulevard can be accepted as the beginning point with its knowledge base identity. This hotspot area can be named as main vessel or resource that contains knowledge intensive firms. So, it can be said that study area has SDUTP character but it should be developed. Survey results suggest that the weakest dimension is governance. In spite of having supportive local policies and master plans, insufficient encouraging policies block willing of firms. They need to be supported for the local economic development at the knowledge based global age to reach the competitive knowledge cities.

The most robust part is existing built environment. Compatible uses as fashion, media districts, cultural and natural environs around the area and historical, most known architectural building stock make the area vibrant and alive. The main foundation of worldwide examples is integration of functions as work, live and play. The İzmir Technology Diamond has an opportunity to supply this need (Figure 4.33). The figure shows the location point of the area in İzmir. In this scheme reel distance is ignored, but it gives true top view distance .The case area can be defined as central business district interested in knowledge based services as ICT firms, technical services, distributers over other business and service sectors. Location of the area is nearly center of the knowledge, creative and culture clusters. In terms of accessibility, area is near to all transportation nodes as harbor, airport, train station and also bus station. Central business districts as Alsancak- the center of lifestyle, commerce, entertainment and culture, besides living , Konak - the branding point of the İzmir, Kemeraltı - The historical urban center full of historical architecture and includes historical cultural sites Agora, Kadifekale, Theatre, Stadium, Balçova - recently developed consumer electronics center for İzmir beside living, culture, entertainments and education like İzmir University of Economics, Bornova - similar to Balçova that includes educational area Ege University. These main central business districts are the proof that the case area locate at the urban center, in the inner city. In terms of knowledge based clusters, around the area there are five university areas. One of them includes technopark R&D area. Moreover creative clusters such as Mimar Kemalettin fashion center, Salhane media center locate around the area. At last, recreational areas show the potential of entertainment, relaxing points. All these clusters make the case area valuable in terms of its location. Proximity to knowledge, creative, culture clusters involves integration of living, working, playing and learning facilities of the area. It proves the potential of the built environment of the area. This is the key for spontaneously-developed inner city technology precinct examples.
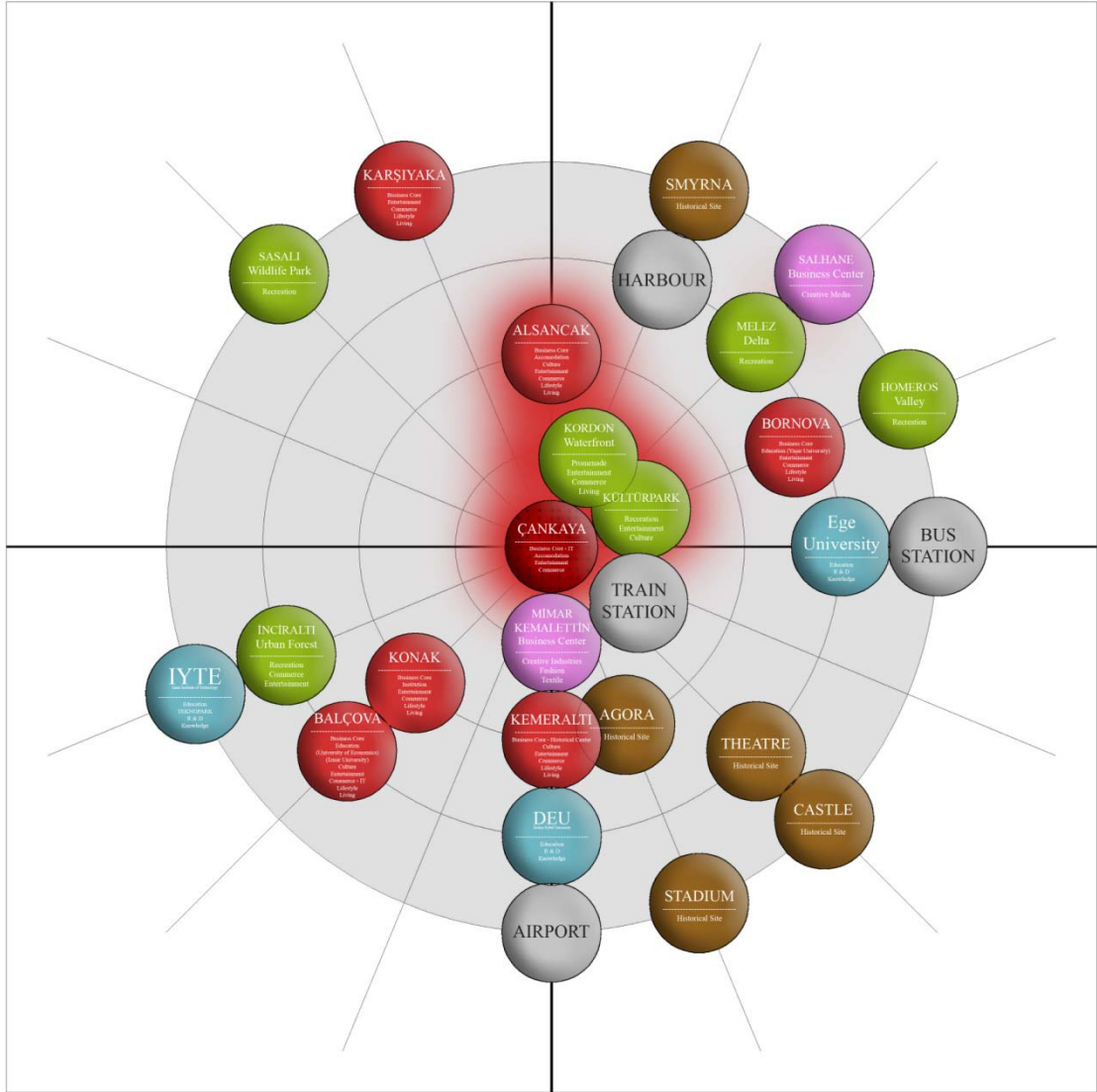
Figure 4.33. Spatial proximity of the area to main facilities in İzmir (bird's eye view)

On the other hand integration of knowledge generator firms with distributers and also technical services is another supportive data in terms of location choice of firms. In terms of accessibility area is taken at the most central point of the İzmir. Citizens and customers can reach the area easily with many transportation modes as bus, port, subway, train and also by private car. The missing point is seamless connectivity. In terms of local knowledge capacity, talented creative and knowledge workers tend to locate mostly in their offices and wireless connection is the common communication tools beside face to face contact. Thus, nearly all the knowledge based firms locate in the area, depend on internet. Breakings on the net are ignorable faults. Although, fiber optic net studies have started, it should be accelerated.

When we examine the area, lack of cultural facilities was stood out. But this necessity can be supplied by the environmental resources. Natural environment is shaped around Culture Park that is the biggest greenery area of close surrounding and host various cultural and social facilities. Accumulation of knowledge intensive firms at the area is not occurred by chance, it depends on the intrinsic opportunities of the area.

To sum up, the area can be considered as an emerging inner city technology precinct waiting for local authorities to develop. It can be potential for local economic development in competitive global environment to use its knowledge based local amenity and become a branding point for İzmir.

CHAPTER 5

CONCLUSION

This study focused on changing characteristics and spatial organizations of technology precincts in 21st century cities that follow the transformation of cities and regions into knowledge societies, and their economies into knowledge economies.

The main aim was to clarify general spatial and organizational properties of spontaneously-developed urban technology precincts that are seemed as valuable assets for local economic development and knowledge based global era.

During the study, İzmir Technology Diamond was pioneer area in terms of its self organizing system to define spatial organizations of SDUTPs. According to research study it can be said that, SDUTPs are self organizing systems and this spontaneity make them more robust. Although, the case area 'İzmir Technology Diamond' showed that it had potential to be a SDUTP, it should be developed in some parts such as partnership in local authorities and private entrepreneurships, seamless connectivity, intensive policies for knowledge based service sectors that can supply their dynamism.

Answers of three main research questions composing the study framework provide more clear definitions in SDUTPs general characteristics and opportunities & threats of İzmir Technology Diamond.

1. What is the main spatial and organizational character of spontaneously developed inner city urban technology precincts?

2. What are the aspects of technology precinct's design or fine tuning?

The analysis of general characters was classified under seven main dimensions (Governance, Connectivity, Built Env., Clustering Env, Talent &Social Env, Cultural Env., Natural Env.) based on INTELI project (2007). The Figure 5.1 below shows the best practices of spontaneously-developed inner city technology precincts. The all seven dimensions are connected to each other.
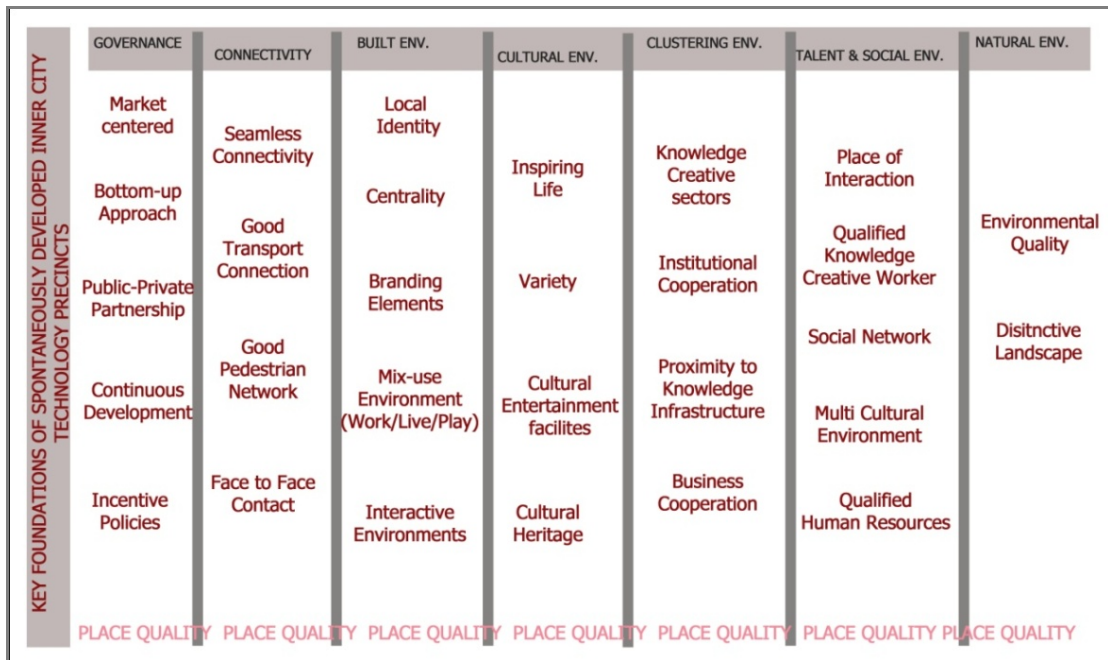
Figure 5.1. Key Foundations of Spontaneously-Developed Technology Precincts.

SDUTP examples are affected intrinsically by opportunities of the existing area. They take place in an existing built environment and their effect to the area is small. Those spontaneous developed urban technology precincts do not try to transform or rebuilt the existing land use while the projects of planned developed technology precincts consist of renewal projects. Rather, these projects trigger soft transformations in the area. Interventions realized mostly to soft areas such as open spaces or potentially obsolescent areas.

While, huge investments for planned urban technology precincts cannot cope with possible faults after the project process, SDUTPs are robust against various risks because of acting as a dynamic living organism unlike static projects of planned ones. As a result, spontaneously-developed inner city technology precincts can be managed as a source of local economic development and supply matter of political and social prestige of cities.

3. What are the possible elements to improve "İzmir Technology Diamond" in terms of spontaneously-developed urban technology precinct concept?

The case studies' main focal point is to clarify potential of being spontaneously inner city technology precinct character of the İzmir Technology Diamond case study via basic seven dimensions (See Figure 5.2).

Figure 5.2. Key Themes of Analysis for Çankaya District

The research results are represented as in Figure 5.3. According to key themes İzmir Technology Diamond is well-connected and the built environment is the most valuable dimension for the area. Moreover clustering environment shows accumulation of knowledge- intensive firms in the area. On the other hand cultural and natural environment has similar potentials. The weakest dimensions are governance and talent & social environment.
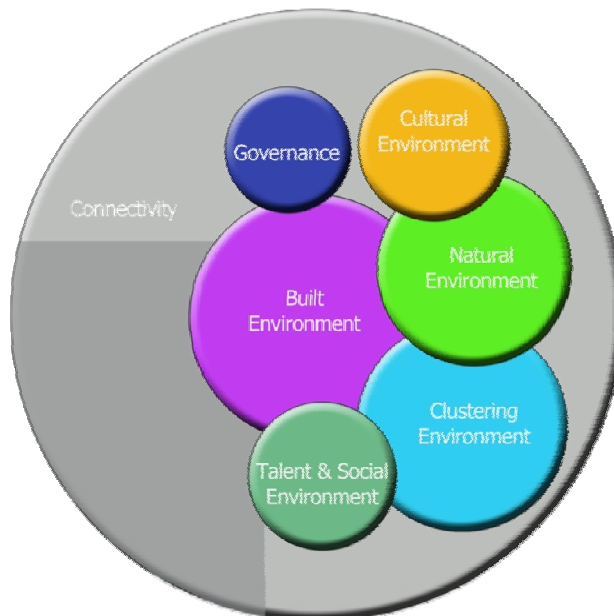

Figure 5.3. Dimension Synthesis of the Case Area

Scale of the bubbles of the graphic defined according seven dimensions. When we compare results of İzmir Technology Diamond with key foundations of SDUTPs, three main headings are obtained. First one is *missing and non existing* properties of the area that should be handled and implemented to sustain success of the area. Second one is *existing properties* of the area that can be improved. Moreover these existing values compose İzmir Technology Diamond's first step local potentials for having technology precinct character. Third point refers to properties that exist in the area but *need improvement*. This means that by small interventions, these properties can be turned to potential for the area.
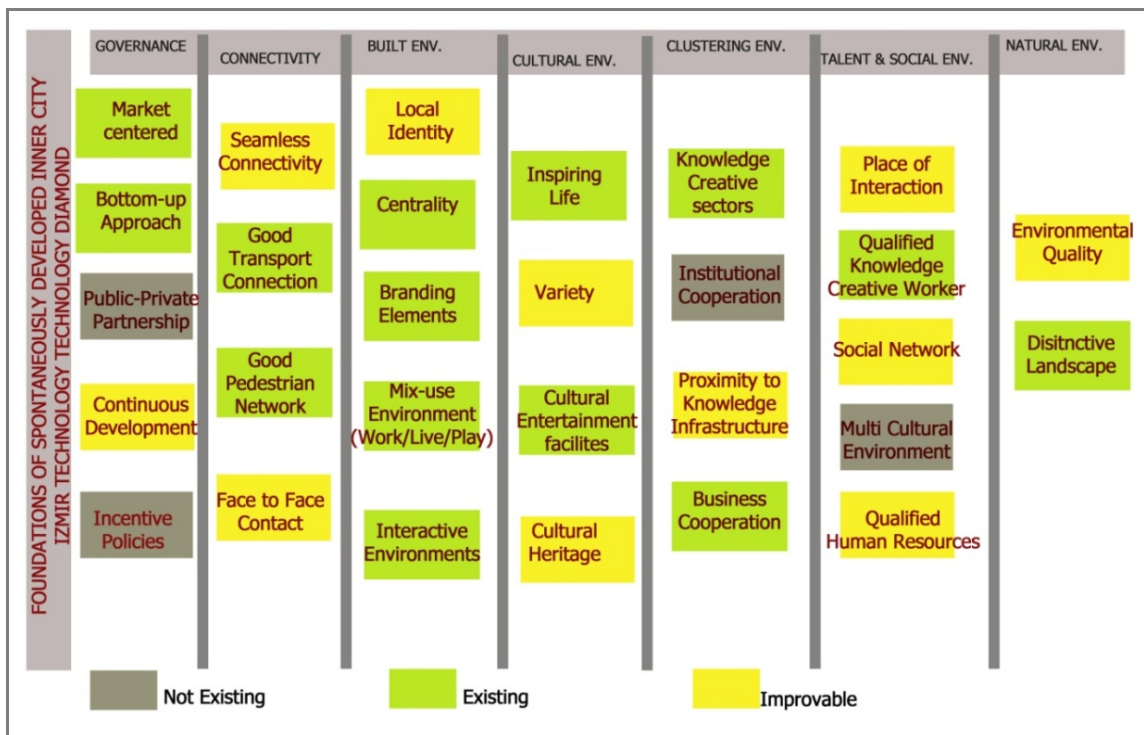
Figure 5.4. Indications of İzmir Technology Diamond.

İzmir Technology Diamond and Şair Eşref Hotspot occurred spontaneously with the effect of market economy and also the character of the area. The main knowledge distributers' location choice can be accepted as the generative for the area. Accumulation process of knowledge-intensive sectors depends on main knowledge assets. Thus, unlike big investments for creating new knowledge intensive areas, potential of the area should be restated and advertized to local authorities and also local residents to sustain experience of place.

In Turkey, SME consists of three main groups; micro-scaled enterprises, small-scaled enterprises and medium-scaled enterprises. The mechanism of state support depends on turnover, portion of shares and financial statement. According to this knowledge and creative intensive service sectors are not named under small and medium entrepreneurships in Turkey, this cause insufficient funds and credits for them. They stand by their own. So, this might block the continuity of development in the area. As in other examples as Silicon Alley, İzmir Technology Diamond should be supported by local authorities with encouraging policies as tax reductions and sustaining IT infrastructure, land policies so on and private-public partnership should be encouraged.

Being at the middle of the main transportation axis sustains ease of access to the area. Good pedestrian and transportation network is an important value for the spontaneously-developed urban technology precincts. İzmir Technology Diamond is well connected except supplying seamless connectivity. Since seamless connectivity is the main feature for the knowledge based developments. The speed and IT infrastructure of the area should be redesigned and improved. In the area, face-to-face contact is still important beside virtual access. The main problem for the İzmir Technology Diamond is advertisement for SMEs to create recognition of the area.

Proximity, clustering and premium access to different infrastructures, services, and amenities strengthen the concept of centrality. The integration of interactive environments with technology districts is a core necessity for being alive. Mixed-use environments of the study area as fashion, media, CBDs cause the ability for sustaining main best practice live, work and play concept. In terms of design issues, local identity and branding elements should be handled as this conception refers to something that owns identity. The beginning point can be assessing historical heritage especially in terms of listed building restorations with the aim of creative and knowledge based social and cultural centers as historic Atlas Hotel, monopoly building. The existing historic fire station building that is adaptively re-used for urban archive can be integrated by knowledge and creative based entities. Cultural environment can be enriched by creativity-based amenities, in the area entertainment and cultural facilities are limited but the surrounding facilities can afford this limitation. On the other hand inspiring life is another reason for choice of location for firms. Different approach for İzmir Technology Diamond is integration of natural and cultural facilities in the distinctive place of İzmir and its proximity to area.

Culture Park hosts international fairs that create a unique opportunity for branding of the area. This idea can be further developed by organizing software fairs.

Innovation environment of the area can be classified as knowledge commercialization because of knowledge and creative sectors use this area for producing and marketing their own designs. Accumulation of knowledge intensive firms, distributers and technical services provide a compact and unified structure that is located in inner city which is benefited as an innovation center for city and a focal point for institutional relationships.

On the other hand, there are some firms that locate at İzmir Technology Diamond for only marketing and their creativity department takes place in the techno park area of İzmir Institute of Technology. Although SDUTPs have direct relationship with institutions and universities, the relocation of related firms from inner-city to suburban technopark areas will result with diminishing of importance and visibility. For instance, according to survey study knowledge intensive firms chose to locate at upper floors of the office buildings. So regeneration study should not move them to basic floors or these accumulated firms cannot be inflicted to pass another separated zone that is created only for them. Because the main point of this research is to clarify their location choice, these spontaneously evolved urban technology precincts should be locate at the center of the core, inner city to supply diversity, vibrancy and create their identity. So, the most important point is, while these spontaneously-developed areas are being improved by urban design policies, their main character should be protected. Because, these areas can be thought as instant generations and possible fault in their spontaneous life can cause death of potential. Existing knowledge and creative workers are invisible for the local citizens and authorities. The main aim is to push other knowledge workers to the area to sustain its prestige. It depends on branding, marketing and advertisement. But sometimes avalanche effect can be negative for these types of technology areas. Because of the rising interest to the area, an increase in real estate values causes existing knowledge capacity escape to other places instead of pushing knowledge workers. With this regard, the main point is to sustain place quality and well integration of seven analysis dimensions support knowledge based urban development and character of İzmir Technology Diamond.

As a conclusion; this study explored the characteristics of spontaneously-developed inner city technology precincts. In this context, the important first step was achieved by investigating the spontaneously-developed urban technology precincts in line with worldwide examples to introduce specifications, techniques and qualities. Within achieved qualities and components from the evaluation of global practices, this element served to analyze and assess suitable cities and regions to designate the opportunities and potentials of those areas for a technology-based development.

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APPENDIX A

Indications of İzmir Technology Diamond

Figure A.1. Indications of İzmir Technology Diamond