

KornetCity: An Operational Model for Belgrade, Serbia

Maja Dimitrijevic, David C. Proseri

(Maja Dimitrijevic, CITYPLAN, majaditri@gmail.com)

(David C. Proseri, Florida Atlantic University, Fort Lauderdale, FL, USA, proseri@fau.edu)

1 ABSTRACT

KornetCity is a conceptual model that focuses on reducing start up and operational costs for small and medium enterprises by equipping office buildings in mostly residential areas. The conceptual model has the advantages of reducing the need for traditional transport investments, parking, and reduced GHG emissions. In this paper, the conceptual model is further elaborated for the specific case of Belgrade, Serbia. Here, the focus is on contextual economic conditions (described and analyzed in terms of economic cluster theory applied to tertiary sector), occupational characteristics (described and analyzed in terms of the local occupational structure and potential areas of strength), and the distribution of potential office buildings. Three typical “kornets” – based on a sector-occupational characterization – are described.

2 INTRODUCTION

The prospects for urban planning, particularly efforts that rely on urban technologies, on being able to help create liveable, healthy and prosperous cities for everyone require, at their core, some notion of economic processes. Economic opportunity is a fundamental principle of the current, market-oriented global economy. In the current world, economic opportunity ranges from global businesses to the local entrepreneur who “fills in the agglomeration effects” necessary for the global businesses to compete successfully. That is, global businesses rely on the existence of a local pool of small and medium size enterprises (SME) to fill in necessary pieces of their production function, ranging from idea creation, to idea visualization, to printing, advertising, and negotiation. A major problem facing these small and medium size firms is the entry cost into the market of firms and capital.

KornetCity is a conceptual model that focuses on reducing start up and operational costs for small and medium enterprises (Dimitrijevic, 2008; Grozdanic and Dimitrijevic, 2009). There are two key ideas. The first is to provide the office space in pedestrian distance for the people working in the tertiary sector that mostly perform their work using computers. There are two ways of doing that: by constructing new Kornet office buildings or by reconstructing the vacant and/or underutilized buildings located in or near residential areas. In virtually every medium sized city in Europe there is a ring of vacant and/or underutilized buildings around a revitalized core. These buildings create dark spaces between the revitalized core and the nearby residential districts. The second idea is to equip office suites in these buildings with the IT functionalities necessary to carry out the business aspects of small and medium size firms. Similar to the efforts of IBM and CISCO in promoting the use of technological innovations to solve urban and metropolitan issues, KornetCity is based on the idea of individual “kornets” – individual office suites appropriately equipped. The very first “kornet” is currently in the seed stage of development in Belgrade, Serbia.

The expected results of using the Kornet concept is to create a more balanced level of development in the whole territory of cities than it is the case today in most of them (i.e. “city” zones with concentrated office buildings). Such a scheme could reduce the number of passengers that participate in every day commuting in motor vehicle traffic in cities, the time and money people spend commuting, GHG&CO₂ emission caused by motor vehicle traffic, re/construction costs of office buildings and last, but not least reducing the start up and operational costs for small and medium enterprises. The bottom line is that this concept offers a more efficient (public budget savings!) way to development.

The purpose of this paper is to demonstrate how the idea of KornetCity, originally created as an advocacy position by the firm CITYPLAN, is and can be further grounded within mainstream economic strategies and policies consistent with the workings of the contemporary global economy. The paper is organized as follows. In the next section, we review the major theoretical treatments of role of small and medium size enterprises in the overall competitiveness of urban areas, including considerations of economic cluster theory and the role of the IT sector. This is followed by a general discussion of the KornetCity concept. The research problem here is to develop an operational model of the KornetCity concept based on the characteristics of the Belgrade’s economic status and potential. The penultimate section contains three

typical “kornets” – for a creative office, for a government-like service office, and for a producer service office. The final part of the paper presents an overview of results, our contribution to the literature, and suggestions for future research.

3 THE ROLE OF SME'S IN THE ECONOMIC “PRODUCTION FUNCTION”

Here, we do two things. First, we review prevailing literature regarding the creation of a sustainable economic structure for metropolitan regions, focusing on the role of small and medium size enterprises in economic processes. Second, we provide a brief overview of the economic characteristics of the Belgrade metropolitan region

3.1 Theory of Small and Medium Size Enterprises

The role of small and medium enterprises (SME) in the economic production function of a city region is often overlooked in an era that focuses on globalization and transnational corporations. The hard reality is that in most economies, small enterprises are major players. One recent estimate contains the following “parameters”: globally, 99% of all businesses are small and medium size enterprises, they account for 40%-50% of GDP; in the EU, SME's comprise 99% of all firms and employ over 65M people (http://en.wikipedia.org/wiki/Small_and_medium_enterprises, accessed 5 February 2010).

The term SME, and its close associate SMB, is in common use throughout both the developed and developing world. As is a common problematic, the term has many definitions, depending on country or place. The EU has attempted standardization as follows: micro (fewer than 10 employees), small (those with fewer than 50 employees) and medium (those with fewer than 250 employees). Another interesting term is SOHO that describes “small offices” of fewer than 10 employees. Very little is really known about these SOHOs.

The importance and role of SMEs in the overall economic production function raises a number of important strategic and economic policy questions, one of which is the general economic issues of “ease of entry” into the marketplace” with its often-associated corollary “start-up costs” or “investment capital”.

Finally, their role in the economic production function of metropolitan regions is related to principles of economic cluster theory, aspects of the occupational structure including attributes of the creative economy, and the potentials of the IT sector to promote urban growth.

3.1.1 Cluster Theory

The most important stream of strategic thinking and research is economic cluster theory. Two attributes of cluster theory are particularly important. First, that “clustering” is normatively the (only) mechanism that could guarantee economic success. Notice that a cluster does not necessarily guarantee economic success, but success cannot be achieved without clustering. Second, that there is NOT a direct correlation between “concentration of economic activity” and “economic cluster.” Magnitude of employment in a specific place may or may not be for example a competitive arrangement but simply co-location of activities. The case of a declining shopping center is sufficient to make the point.

Three cluster theorists provide guidance for how to know and measure the existence and value of a set of economic activities. Porter's industrial cluster theory (2002) and its application to urban areas (1995) appear most appropriate for the design of new clusters. Yet clusters are more than unsubstantiated policy tools and can be empirically verified. At the evaluation level, Van den Berg et al. (2001) provides a clear set of intuitive criteria to assess existing and emerging clusters. Focusing on different sectors (cultural, electronics, telecommunications, health, media, and tourism), Van den Berg et al. lay out three broad potential criteria. They, and their components, include: (1) spatial economic conditions (strong local demand, intra- and inter-regional accessibility, quality of life, and ‘cultware’); (2) cluster specific conditions (initial size and development, cluster engines, strategic interaction, and level of new firm formation); and (3) organizing capacity (strong shared vision, political/social support, and public-private partnerships). Finally, Mommaas (2004) is concerned with “place-based development.” Mommaas' criteria to evaluate clusters include: horizontal aspects; vertical aspects; internal organization factors; external organizational factors; integration and/or openness; specific development paths; and spatial organization. These are all recognizable terms in the language of agglomeration and urbanization economics (cf. Bogart, 1998). Mommaas then examines these criteria in terms of five attributes of overall development practice including: (1) strengthening the

identity, attraction power and market position of places; (2) stimulating a more ‘entrepreneurial approach, (3) stimulating innovation and creativity, (4) finding a new use for old buildings and derelict sites, and (5) stimulating cultural diversity and cultural democracy.

3.1.2 Creative Enterprises

Once again, there are three theorists that dominate this arena. First, Howkins’ *The Creative Economy: How People Make Money from Ideas* (2001) focuses on industrial groups and employment categories deemed “creative.” His fifteen industrial sectors are (quoting from Florida, 2002, p. 47): R&D, Publishing, Software, TV and Radio, Design, Music, Film, Toys and Games, Advertising, Architecture, Performing Arts, Crafts, Video Games, Fashion, and Art, listed in descending order of global expenditures. The message is clearly one of “creativity at work”: those industrial sectors covered by intellectual property law – aspects of law that cover patents, copyrights, trademarks, and designs (Healy, 2002).

Landry’s *The Creative City* (2004, in its fourth edition since 2000) is one of the mantras of local politicians and economic development practitioners. Landry’s book and practice (www.comedia.org.uk) emphasize place. The descriptions and precedents are particularly useful in the UK and other European contexts where the planning of cultural quarters (one, but not the only, use of the word “creative”) is an instrument of downtown revitalization. Any benefit to the economy is, at best, circumstantial. A number of scholars have described, evaluated and/or suggested improvements to this kind of practice (e.g., McCarthy, 2005).

Finally, Florida’s *Who’s Your City* (2008), based on concepts and ideas originally developed in *Rise of the Creative Class* (2002) focuses on occupations and characteristics of workers, particularly in the “creative” class. There are arguably three basic premises. First is that the economy can be broken down into four or five categories of workers, defined on the basis of occupations, some of which are called “creative.” The creative group is composed of two groups – the super-creative and the (merely?) creative. Second, over the long term (roughly the 20th century) the proportion of the total working in these classes of occupations has been rising. Third, and perhaps most controversially, that this class is responsible for growth and that this class is “attracted” to places that are well endowed with talent, technology and tolerance (the 3 T’s) of economic development.

Taking a somewhat broader and empirical approach, Prospero (2005) examined the distribution of the set of creative firms in the South Florida context. The key point is that all creative firms do not have similar locational attributes. Some prefer the center city location; others more suburban locations. Among those preferring center city locations are lawyers, architects, and other firms that tend to do business with governments.

3.1.3 THE IT DIMENSION

The literature on the role of the IT revolution (e.g., Castells, 1996) and sector on urban growth, form, and liveability accounts is voluminous. The trilogy of work by Audirac (2005, 2003, 2002) presents a general overview of the contours of the debate. The general literature points to two “opposite effects”: the concentrating effect (agglomeration economies are still important and since IT is the new ‘capital’ of business operations it must be part of the urban-oriented business location decisions) and the deconcentrating (distance is irrelevant as long as the business is hooked up with the virtual world; people can work from anywhere). More specifically, the IT revolution points to both the “potential reconcentration of certain activities but also to the furtherance of exurban development, sociospatial segregation and traffic gridlock” (Audirac, 2005, p. 212).

Since there is no clear cut answer, the key is to uncover specific synergies in specific contexts – probably based in the principles of economic cluster theory, as above. Yet, a careful tracing of the types of firms that are likely to benefit from center city locations has not been attempted empirically, other than location studies like the empirical findings of Prospero (2005) above.

In such an environment, it is not surprising that the real estate and IT infrastructure sectors have responded with the twin notions of “smart buildings” and “smart social consciousness”. Smart buildings (capable of supporting high end computer systems as part of the building infrastructure) are not new. The clustering of smart buildings into advanced office park for creative, IT dependent, workers is a hallmark of contemporary economic development strategies. What is becoming newer is the notion that the IT providers are developing applications to direct “smarter” decisions. The IBM Smarter Planet campaign

(<http://www.ibm.com/smarterplanet/us/en>) seeks to work with clients to make the world “smarter” by working on systems to improve performance on roadways, health care, power grids, and food production, among others.

3.2 Belgrade and the Belgrade Region

As the EU expands, cities and regions in central and eastern Europe (CEE) are attracting increasing attention, both academically and professionally. For example, Hirt (2009) outlined the development path of Belgrade focusing on five periods of growth and change the most recent being communist, transitional, and contemporary and shows how its recent past is marked by abrupt shifts in political status from a capital of a relatively small nation-state, to a center of larger and prosperous multi-national federation back to a capital of a nation-state. Arguably, economic development policies and strategies are context sensitive; the search for competitive and comparative advantage is at least partially determined by local territorial capital.

There is a Master Plan for the City of Belgrade 2001-2021 (Belgrade Land Development Public Agency, 2003). In the subsequent draft SMART PLAN – a transportation plan (Belgrade Land Development Public Agency, 2008), planners conducted a background analysis comparative study of “comparable” cities. Comparable means populations between .7M and 2.1M and include: Bucharest, Vienna, Glasgow, Copenhagen, Helsinki, Lyon, Munich, Prague, Stockholm, and Torino. The analysis was conducted for twelve other variables including: share of work places in city central zone, GDP per capita, motorization ratio, mobility rates, length of road network per 1000 inhabitants, parking lots per 1000 work places in the city central zone, public transit vehicles, modal split, average road speed, average public transit speed, and a ratio of speed on road v. transit. According to this report, Belgrade has the highest proportion of jobs in the central business district and the highest percentage of workers travelling by public transport (53%), and about average percentages of people walking to work. But Belgrade also has the lowest GDP per capita, motorization ratio, mobility rate, road network length, number of downtown parking lots, average travel speed on public transportation, and share of financial assistance to allocate to transport, and number of downtown parking lots. However, the ratio of road speed/public transport speed is second, lagging only behind Torino. Interestingly, only Munich has a negative number on this indicator, meaning that it is the only city among the comparables in which public transportation speeds are higher than road speeds.

3.2.1 Some General Population Characteristics

According to Wikipedia, the population recorded in the 2002 census revealed a population of 1.576M in the “larger-city” area and 1.273M in the “inner-city” area. Recent polls show that the “larger-city” area has increased by 400K in just five years, yielding an official estimate in 2007 of 1.63M. The “inner-city” area, which is consistent with the political boundaries of the City of Belgrade, has, according to Master Plan (2003, chap 1.3.2, table 1) a population of 1.352M in 2005. The official planning estimate by this agency predicts an “inner-city” population of 1.4M by 2021, an estimate that is probably too low.

The population is spread over 17 municipalities, ten of which belong to the “urban zone”: Vracar, Stari Grad, Savski Venac, Novi Beograd, Cukarica, Zvezdara, Palilula, Zemun, Rakovica and Vozdovac. The largest in terms of population is Novi Beograd (218K); the smallest is Sopot (20K) in the suburban zone. The geographic extent of the metropolitan area is 3.22K sq km; the city is 396 sq km. Simple calculations reveal a population density of the “inner-city” area of approximately 3414 persons/sq km. This makes it equivalent to Vienna, and higher than Glasgow, Munich (3100), Glasgow, Budapest (2550), and Helsinki (2100), (source: <http://www.citymayors.com/statistics/largest-cities-density-125.html>).

3.2.2 Economic Sector Analysis

Belgrade is located in the center of South East Europe, at the intersection of the strategic Pan-European transportation corridors No 10 and No 7 linking western and central Europe with the Middle East. It lies at the confluence of the Sava and Danube rivers. The Belgrade airport contains direct connections to 43 European and Asian cities.

Belgrade was the winner of a competition for cities and regions of the future in 2006 and 2007 organized by the Financial Times magazine (other winners were: Paris, Western Europe; Brno, central Europe; Baku, Eastern Europe; and London, northern Europe). This award is based on criteria such as economic potential, operating costs, human resources, transport, IT/telecommunications, and quality of life for foreign investors.

Today, it is estimated that over 35% of Serbia's GDP is generated by the city, which also has 31.4% of the employed population. Belgrade is the most economically developed part of Serbia and is home to the country's National Bank. Other notable companies include Jat Airways, Telekom Srbija, Telenor Serbia, Delta Holding, Comtrade group. Belgrade is a regional center for Societe Generale, Asus, Intel, Motorola, MTV Adria, Draft Foods, Carlsberg, Microsoft, OMV, Unilever, Zepter, Japan Tobacco, P&G, and others (http://en.wikipedia.org/wiki/Economy_of_Belgrade).

Recent studies by Danos Consulting (2009) indicate a number of macroeconomic trends from 2006 through 2009; they are shown below in bullet form:

- GDP has grown by 25%.
- GDP/capita has risen from 3.278 to 4.186 Euros.
- Exports of goods have increased over 200%; imports have declined (but these numbers are particularly sensitive to an "end point" bias, reflecting unique activity in 2009).
- Foreign direct investment in the aggregate and as a percentage of GDP is declining, but not as fast as the "end point" bias would suggest).
- Unemployment has declined somewhat.
- Inflation is higher in the post 2007 fiscal environments.

Some other characteristics, culled from the Master Plan except where noted, are shown below in bullet form:

- The size of the consumer market is 1.7M (source: current market estimates provided by Danos International).
- The ratio of employed persons to total population is .403 (545K/1.352M).
- Of these workers, 73.55% work in the tertiary sector (so, approx 401K). The average monthly income per capita is 47,500 dinar (572 Euros, 903 dollars). Updated numbers suggest monthly grosses of 59,897 dinars (746 Euros, 1082 dollars) and nets of 42,901 (535 Euros, 774 dollars). The average GDP per capita is 10836 dollars in real terms and 18204 in terms of purchasing power parity (http://en.wikipedia.org/wiki/Economy_of_Belgrade).
- There are 62 university-level institutions. Belgrade boasts well educated, fast learning, multilingual and IT literate labor force. Over 8K students graduate from Belgrade University every year, with 1/3 of them adding to the traditionally strong engineering base. According to Gallup International, the percentage of English speakers is the highest in the CEE, and an increasing number of western business schools open their affiliates in Belgrade.
- There are 3.5M trips per day in Belgrade, of which 16% or 530K are for business purposes. The modal split for the journey to work is: 59.07% public transportation, 24.75% private care, 13.87% walking, and 2.31% other.
- According to the Eurostat methodology, and contrasting sharply to the Balkan region in general, 53% of the city's households own a computer and 39.1% of households have an internet connection. These figures are above those of the other regional capitals such as Sofia, Bucharest and Athens. (<http://en.wikipedia.org/wiki/Belgrade>).

According to Danos, the office market in Belgrade increased between 2008 and 2009 by 8% and now represents approximation 700,000 sq m. Most of this development is in Novi Beograd, with the notable exception of the B2 building in the traditional downtown. The B2 was developed in partnership with Cisco, a leader in the IT industry, has connected IT and real estate development in an attempt to reduce both operation and energy costs. In 2008, the intelligent building B2 was opened. B2 is an almost 24,728 sq m (approx 2.5M sq ft) complex that combines a shopping mall, offices, residential and business apartments with four levels of underground parking. The idea is to create a world-class living and working environment in a smart building that can be operated in a cost- and energy-efficient ways with high levels of physical security. At the heart of the approach is a service-oriented network architecture designed to reduce costs and complexity by replacing formerly disparate systems with one simplified, flexible and scalable Internet Protocol (IP) network. The estimate is that this approach can reduce capital costs by 20-25%, total operating costs by 30%, including a 40% reduction in energy consumption. With significant technological capacity,

this project is targeted at high end residential consumers and firms. However, the office space in this building is only 4K sq m .

The following data come from the Economic Potential Report obtained from the City's website. They are also highlighted in bullet form:

- Among registered businesses, there are approx 53K businesses and 48K entrepreneurs
- Among the municipalities, Novi Beograd has the largest number of companies and entrepreneurs (9642 and 6689, respectively)
- Stari Grad has the second largest number of companies and the second lowest number of entrepreneurs; Zemun has the third least number of entrepreneurs.
- Among the municipalities in the urban zone, the municipalities with the largest number of entrepreneurs (and hence possible tenants for a KornetCity type activity are: Cukarica, Palilua (which has the second lowest number of "companies", Vozdovac, and Zvezdara.
- Among SME firms, the largest percentages are in "trade, including repair", real estate business and renting, and construction. Of these, only real estate is a tertiary sector activity. Government, health care and social protection, and personal and social services are other possibilities.

4 THE KORNETCITY CONCEPT

The KornetCity concept has several basic building blocks: work spaces, notions of a business plan, and when applied to a geographical locality a geographical distribution based on gravity flows of workers. Each is discussed in turn.

Regarding work spaces, the concept seems to connect the best characteristics of work in the office and work from home. It is especially appropriate for SOHO type businesses, particularly during their start up stage. These work spaces are particularly appropriate for firms and/or occupations that rely on the use of the computer as a principle source of work material. These work spaces are called and are equipped as a NetCell, that is, a place that has all necessary software, hardware, and internet connection as well as sufficient information flow for conference connections to be performed without interruption. These NetCells are aggregated into a specific "kornet" or specific office building.

Regarding the notion of business plans, the KornetCity concept relies on the idea that working in Kornet provides the possibility of renting software per usage, that is, "you pay exactly what you use". This enables the usage of any kind of software with a certain fee. This way software would become economical and legally more accessible which would improve the level of informatics literacy of the population.

Regarding the notion of geographic distribution based on the gravity flow of workers, the basic idea is that these buildings could be spread over the city at a distance of up to 1.6km from each other. This distance is equivalent to a maximum commuting distance of up to 800m, which represents a 10 minute walking distance.

4.1 A Proto-typical Kornet Building

"The schematic appearance of Kornet building exposes differences from traditional office building in the level of integrity of ICT installations. This is shown in Figure 1.

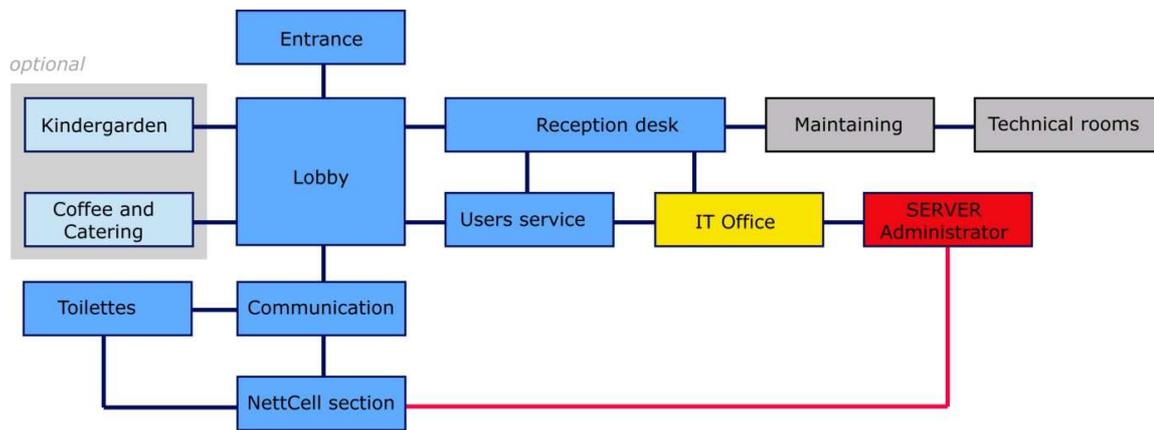


Figure 1: Schematic Presentation of Kornet Office Building Organization

4.2 Business Model

Grozdanic and Dimitrijevic (2009) have argued that KornetCity should be acceptable and convenient for SME and SMB, especially for startup investments.

At the beginning of an entrepreneurial activity, a fundamental idea is that the scope of work and the extent of business will expand. The entrepreneur needs to buy or rent work space. The typical tendency is to both: (1) find space that is usually bigger than current company currently needs, and, (2) buying more software and hardware.

In the Kornet City model, the company rents only what it currently needs, which provides a usage rate of 100%. No matter if the number of employees is increasing or decreasing, this does not require change of company's residency and increased investments in office space. Hardware and software is always 100% used and is most economically and ecologically justified.

4.3 A System of Kornets

Grozdanic and Dimitrijevic (2009) have shown that a system of fully occupied "kornet" buildings distributed at 1.6km apart would decrease traffic in Belgrade and reduce GHG by 8%. These results are based on the notion of capturing employees who would work near their residences. The value of the KornetCity model is based on the transfer of a large percentage of work trips from "mechanized" to "walking".

5 RESEARCH PROBLEM AND METHODOLOGY

What has been missing to date is some firm understanding of the types of firms, and the reasons why they would consider KornetCity considerations. To now, the assumptions are based on market share. To add meat to the overall proposal, this paper begins to focus on what kinds of firms, and what outfitting is needed. The previous work is extended by inclusion of graphic representations of what a Kornet NetCell might look like, and consideration of what the "outfitting" might look like for three proto-typical potential users.

6 RESULTS: AN OPERATIONAL MODEL FOR BELGRADE, SERBIA

There are two major results. The first is general design ideas for basic and advanced NetCells. The second is a description of how these could work for three proto-typical types of firms.

6.1 Designing Typical Kornets for Belgrade, Serbia

Here, we discuss the interior design of a kornet NetCell, and basic ICT considerations for these NetCells.

6.1.1 Basic Rendering of Basic and Advanced Net Cells

A kornet building is based, initially, on the idea that there are two basic types of potential users: basic and advanced. The Basic NetCell has minimal dimensions of 3.0x1.7m (5.1m²). Natural light is provided. The interior design would cost less than 450 Euro/m² (current Belgrade Fit Out costs). Acoustic insulation between NetCells performed in the rank of sound-proofing as in the standard offices.

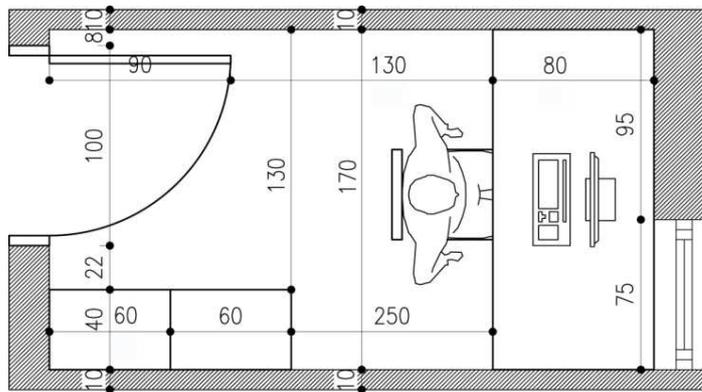


Figure 2: Basic NetCell Layout

The Advanced NetCell has minimal dimensions of 3.0x2.7m (8.1m²) with a window offering a good view. The interior design would cost between 600 and 800 (current Belgrade Fit Out costs), Euro/m² areal and aesthetic higher quality of office space. A workstation chair that can be converted to a comfortable berth chair in a horizontal position for brief moments of rest or an area designed for coffee breaks. Acoustic insulation between NetCells provides better sound proof conditions (for the need of the specific occupations (radio DJ, musicians, necessity for higher confidentiality when the information needs to be exposed/delivered through talking).

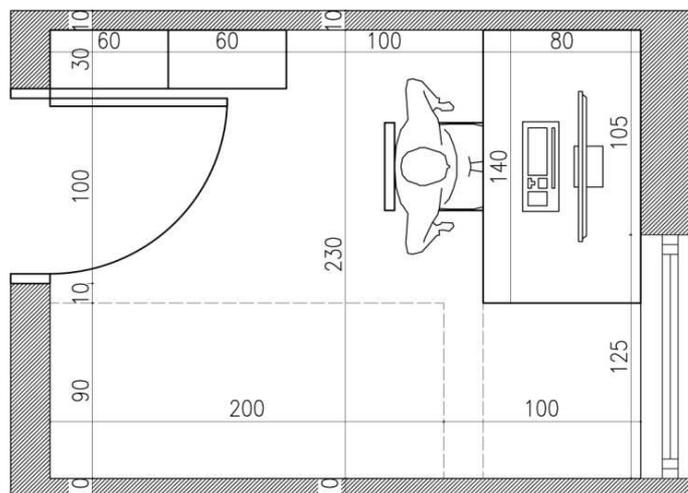


Figure 3: Layout of an Advanced NetCell

6.1.2 ICT parameters for Basic and Advanced Net Cells

The Basic NetCell would have standard network data flow capacity, including those normally used by public service employers (monitor, mouse, keyboard, and other peripherals). Expected users would be: employees of regular importance in companies as well as “additional workers” that could be called in for temporary spikes in workload. These users deal with information up to medium levels of importance.

The Advanced NetCell would have maximum data flow capacity, high level of data transfer security, high quality hardware (large monitors, exclusively latest hardware components, well-known and recognized brand manufacturer). Expected users would be: people running SME or people working as high positioned employees/consultants, etc. dealing with Information of medium to high level of importance.

6.2 Examples for Belgrade, Serbia

Both the theoretical discussions and the discussions of the Belgrade economic situation suggest that there are certain types of businesses that could benefit from a kornet type solution. The theoretical literature suggests very small, SOHO-scale firms in the creative, governmental, and some advanced producer services. Illustrative examples are provided for each.

6.2.1 Example 1: An Architectural or Similarly “Creative Office

The beginning of functioning of an architectural studio as a SOHO-SME considers for the start just one architect working in the studio (as the Owner). It requires the start up investment in Kornet service that includes office space (NetCell), IT support, fast Internet flow, certain level of data security, rent of software according the specific demands of user and usage of external services (printing of large format drawings, scanning, etc.).

During the start period of this architectural studio, the income is almost zero and the expenses in a classical office would demand the significant start up investment like renting a space for studio that would be appropriate for at least two more people for a period of at least twelve months (standard practice for rent agreement in Belgrade). In case of equipping this space with appropriate interior elements hardware and software (performed at the beginning of studio functioning), the risk of investment in an architectural studio is significantly higher than investment in same SME but located in Kornet.

In the first few months of functioning of architectural studio, the one who runs it will spend most of the time trying to get the business engagements. Possibility to work in Kornet as in business incubator provides many options that one SME at the beginning of functioning might experience as an advantage (gathering at the same place companies that might be seen as a potential partner rather than a potential competitor, sharing a “floor secretary”, possibility to use meeting hall upon the necessity, IT services upon request and software renting etc.).

If or when the newly founded architectural studio obtains a job that requires the engagement of more than one architect, that creates the necessity to employ co-workers of a certain profile (additional architects, technicians, other engineers). The engagement of those people does not required that they need to be located in the same space, since almost all of their data exchange can be performed through the Internet. This kind of communication enables “additional workers” to work from Kornet that is closest to their home. Thus, the team could work on one project; communicate with no interruption but to be physically dispersed.

Since each of employees is working from his own cubicles, the investment in NetCell renting is always optimal for SME since the rent will last for as long as the employee works for SME. Thus, SME using Kornet is actually using their employees as “outsourcing” and the flow in the number of employees would not create the need for larger/smaller office space. As soon as the job is finished, SME will let go the “additional workers”, until other work increase occasions.

6.2.2 Example 2: A Call Operator Service (as an example of a NGO Office)

This example uses a call operator service as an example of a NGO. The more specific association to the work of NGOs or local government is those call centers that are created in and during various sorts of political or public opinion campaigns.

In a call center office, there are two way communications. First, external communication that uses the telephone as major device for communication with users and second, internal communication that is processing collected data for clients. Contact with target group of people is mostly performed in verbal communication that creates a certain level of noise.

Operating the call center in the form of campaigns can last from few days to a few months. According to the specific need of a client, a call center is hired that provides a certain number of operators to the campaign of that client and designates them information they need to provide to target group. Thus, call centers employ large number of operators creating a pressure on spatial demand in classical call operator organization.

Moreover, there exists the possibility that, when work load increases, to disperse additional workers to a nearby Kornet office. That way, the external communication remains the same (telephone) and the internal communication is performed through the Internet connection with the headquarters of the call center.

6.2.3 Example 3: An Advanced Producer Service (Accounting, Legal, etc.) Office

The final example is that of an advanced producer service office such as an accounting or legal office. These services, like most administrative services have an obstacle of overcoming the prevailing preference for analogue form of documents. Still, the validity of electronic signature (the law of the validity of electronic signature was adopted in 2004 in Serbia) creates the expectation that these obstacles can be overcome and that the use of digital forms and electronic signatures will continue to grow.

Considering that, functioning of one accounting office in Kornet is possible today. Invoices could be sent through the internet and authorization of documents could be done in digital form. Since accountant, governance, legal, in one word – all administrative work has as ultimate obligation of archiving files thus, the potential usage of cloud computing (that Kornet could provide) could provide a significant benefit considering safe managing and storage of endless amount of data.

7 CONCLUSION AND EXTENSIONS

The KornetCity concept, previously postulated as a tool for reducing energy-dependent travel, is argued in this paper as a tool for economic development. It has placed the concept within the more general urban economic development literature, which among other things focuses on small and medium enterprises, the need for agglomeration economies, and the role of IT. Using the Belgrade, Serbia context as an example, the results are framed with the need for both design (characteristics of buildings, including the lack of parking spaces) and economic (what types of firms) considerations. Examples of three proto-typical kornet work spaces are provided.

Potential future research topics could include: (1) more “kornet” examples; (2) results of implementation of a “kornet”; and (3) a larger scale “economic” analysis. Each is briefly discussed. First, consider as an example of other types of kornet spaces, the game NetCell. Physically, the minimal dimension is 3.0x2.7m (8.1m²). There is no need for natural light. The orientation and view of the surrounding space is unnecessary and even undesirable. Interior design would cost less than 400 Euro/m², since such things are of secondary importance. Acoustic insulation between NetCells should be of high quality. Such NetCells that do not require the natural light could be very useful tool in providing the maximum parameters in re/designing Kornet building in the high density constructed areas. The IT parameters include high network data flow capacity. Hardware equipment should provide excellent graphical solution – large high-resolution monitors, fast processors, etc. in short – expensive hardware. Additionally, specific equipment is needed – VR helmets/headsets, gloves, “weapons”, steering-wheels, joysticks, and headphones. The option for on-line gaming should be anticipated – therefore, high-volume network data flow is required. The Game NetCell for gaming should be profiled, in terms of size, to the User in sitting position, as well as to allow the said User the room for limited maneuvering (leg se apart, crouching, jumping, lying down, simulation of sitting in a vehicle/a flying craft/on a motorbike, etc). Second, a pilot project underway, consisting of just 7 NetCells, “KornetCity: an IT Business Concept that reduces Motor Vehicle Traffic in Cities“ has been endorsed by the European Commission's Sustainable Energy Europe Campaign as an Official Partner. (<http://www.sustenergy.org/tpl/page.cfm?pagID=15&id=2698&submod=details>). Monitoring and evaluation of this project, estimated to provide significant energy savings, will provide further empirical evidence of the usefulness of this approach. Third, it could be interesting to conduct two related studies: an inventory of potential “kornet” buildings – those that are available for such conversion as well as a much more detailed inventory of SOHO-type firms in the Belgrade context. The forthcoming paper by Dimitrijevic and Prospero (2010) begins this line of research. The current research reported here indicated that certain sections of the Belgrade have more entrepreneurs than others, areas that would be particularly amenable to KornetCity solutions.

8 REFERENCES

- AUDIRAC, I. Information Technology and Urban Form: Challenges to Smart Growth. In: *International Region Science Review*, Vol28 Issue 2, pp. 119-145. 2005.
- AUDIRAC, I. & J. FITZGERALD. Information Technology (IT) and Urban Form: An Annotated Bibliography of the Urban Deconcentration and Economic Restructuring Literatures. In: *Journal of Planning Literature*, Vol 17, Issue 4, p. 480-511. 2003.
- AUDIRAC, I. Information Technology and Urban Form. In: *Journal of Planning Literature*, Vol 17, Issue 2, p. 212-226. 2002.
- BELGRADE LAND DEVELOPMENT PUBLIC AGENCY. Master Plan, 2003.
- BELGRADE LAND DEVELOPMENT PUBLIC AGENCY. SmartPlan, 2008.
- CASTELLS, M. *The Rise of the Network Society*. Oxford, UK: Blackwell Publishers, 1996.
- DIMITRIJEVIC, M.: Kornet – An IT Model of the City. In: R. Bogdanovic, *New Urbanity, Integration-Disintegration of the City?* Belgrade, Društvo Urbanista Beograda, pp 207-215. 2008.
- DIMITRIJEVIC, M. & D.C. PROSPERI: KornetCity: An IT Entrepreneurial Development Strategy. Paper accepted for presentation, ICEIRD, Novi Sad, Serbia, May 2010.
- DANOS (INTERNATIONAL PROPERTY CONSULTANTS & VALUERS). *Belgrade Office Market*, 1H, 2009 (<http://www.danos.rs/index.php?jezik=engelski>).

- FLORIDA, R.: *Who's Your City. How the Creative Economy is Making Where you Live the Most Important Decision of Your Life.* New York: Basic Books. 2008.
- FLORIDA, R.: *The Rise of the Creative Class.* New York: Basic Books. 2002.
- GROZDANIC, M. & M. DIMITRIJEVIC: *KornetCity – IT Model of Business Concept that Reduces Motor Vehicle Traffic in Cities.* In: CD Proceedings, 45th ISOCARP Congress. Porto, 2009
- HEALEY, K. *What's New for Culture in the New Economy?* In: *The Journal of Arts, Management, Law and Society*, Volume 32, Issue 2, pp. 86-102, 2002.
- HIRT, S. Belgrade, Serbia. In *Cities*. Vol. 26, Issue 5, 293-303, 2009.
- HOWKINS, J. *The Creative Economy: How People Make Money from Ideas.* New York: Penguin. 2001.
- LANDRY, C.: *The Creative City. A Toolkit for Urban Innovators.* UK: Earthscan. 2004.
- MCCARTHY, J. *Bottling Bohemia: The Use of Cultural Quarters for Sustainable Regeneration.* Paper at Urban Affairs Association, Salt Lake City, 2005.
- PORTER, M.: *Clusters and the New Economics of Competition.* Cambridge, MA: Harvard Business School Press. 2002
- PORTER, M.: *The Competitive Advantage of the Inner City.* In: *Harvard Business Review*, (May/June), pp.55-71. 1995.
- PROSPERI, D.C. *Distribution of Creative Firms in South Florida.* In: CD Proceedings, 41st ISOCARP Congress. Bilbao, Spain.
- VAN DEN BURG, L. E. BRAUN, & W. VAN WINDEN: *Growth Clusters in European Cities.* In: *Urban Studies*, Vol 38, Issue 1, pp. 185-205. 2001.