Széchenyi István University

Doctoral School of Regional and Economic Sciences

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Master in economy

The creative node

Doctoral thesis

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Contents

Introduction

According to *Széchenyi* (2002), the most valuable asset is the human mind. *Bradley* (2012) thinks that creating new idea is the key to the real wealth. Nowadays the value of companies are based not only the fixed assets, immaterial assets, like brands and intellectual properties are the keys to the global competiveness. Companies like Alphabet (Google's owner) can be always successful, because they constantly improving their products, they are innovative, constantly implementing new ideas and they are not limiting themselves to one industry. The globalization removed the borders between countries, the internet reduced the distance. The key to success is a new and creative way of thinking. It is important to distinguish the creative economy and industries from the knowledge economy, where the innovation is part of the traditional manufacturing industries.

The products of the creative industries are consumed because of their cultural aspects (*Enyedi*, 2002) and not because of utility. There are countless approaches, governmental institutes used statistical codes and mixed cultural industries with high-tech industries, Richard Florida focused on the people and created the creative class based Marx working class theory.

I had the opportunity to work as a guest researcher at University of Amsterdam, where we collected job vacancies with web crawlers, to gain knowledge about jobs and skills. I used these

datasets and methods to research creativity, to compare the different creative industries and class models. My main idea is that the creative economy is affected by space, so I started to research which factors causes that some of the cities are creative, some are not. In the literature review part I present the researches I found about the measurement the creativity at city level. The main goal of my dissertation is to bring the focus on a smaller scale than a city, with the creative node model I tried to explore the level of neighborhoods.

The method of the hypothesis testing

I think, for the economy like the knowledge based economy or the creative nodes, we need new methods, new kind of analyzing techniques. So to test my empirical hypothesis I will use creative methods: In the years of 2010's the storage cost of the information technology became very low and the computing capacity very high (*Lévai*, 2013), so the issues of data processing (*Ramakrishnan et al.*, 1999) are not existing anymore. My hypothesis are tested with text mining and with datamining (*Edelman*, 2012).

1. Datamining

I used information technology to collect and analyze data about spatial factors (*Rechnitzer et al.*, 2013). Nowadays you do not need super computers to store and process data, even a mobile phone has the sufficient capacity. There is no need for sampling, a home computer, a laptop can handle this kind of quantity. The first who made big commercial success with datamining was the online bookshop, Amazon. In that time datamining algorithm was used on data warehouses to get some deeper knowledge about datasets. Amazon developed a datamining and machine learning based recommendation tool to analyze user's behavior and recommend a product immediately to them, which lead increasing in the sales volume.
Before this innovation Amazon used experts to write reviews and recommendations about the books. Datamining allowed them to make much better segmentation of their customers. I used datamining on the dataset that I collected.

2. Web mining

Any content that can be viewed on a webpage can be scraped, so the dataset used in this paper is based on data obtained from webpages about coworking spaces. Scrapy[1] is an open source Python[2] framework made for large scale web scraping. Websites are diverse, so there was no ready to use solution, I needed some time and ad hoc tries how to create the dataset for the research. In my dissertation to gain knowledge about the creative labor market I used web crawlers to collect data from coworking spaces. This method named as web mining (*Cooly et al.*, 1999). After the web crawlers finished I made data cleaning and parsing to build a dataset. In the everyday life we can find examples for web mining at price collector webpages, which are aggregating different webshops product pages and prices.

Table 1. - Comparing methods

Method	Input Data	Data Type	Usage of data	Chapter	Focus
Datamining	Tables in the database	Anything	Deep analysis	5.3 Coworking spaces as workplaces	Coworking spaces in Budapest and in Amsterdam
Web mining	Internet	Text and pictures	Collecting and creating database	3.2. Creative industries in Hungary 5.1. Coworking spaces as third places	The distribution of creative class in Hungary Győr-Moson-Sopron county's creative workplaces Coworking spaces attributes
Text mining	Text documents	Text	Natural Language Processing	3.2. Creative industries in Hungary 5.2. People in the coworking spaces	Győr-Moson-Sopron county's creative workplaces Location of the coworking spaces

Source: Own construction (2016)

3. Text mining

The goal of the text mining is to find hidden information in unstructured text files (*Tikk*, 2007). I have used this method to map coworking offices in cities neighborhoods and to classify job advertisements as creative vacancies. In the first table (Table 1.) I compared the different methods I have used. The first parameter is the methods of the data source, to demonstrate what

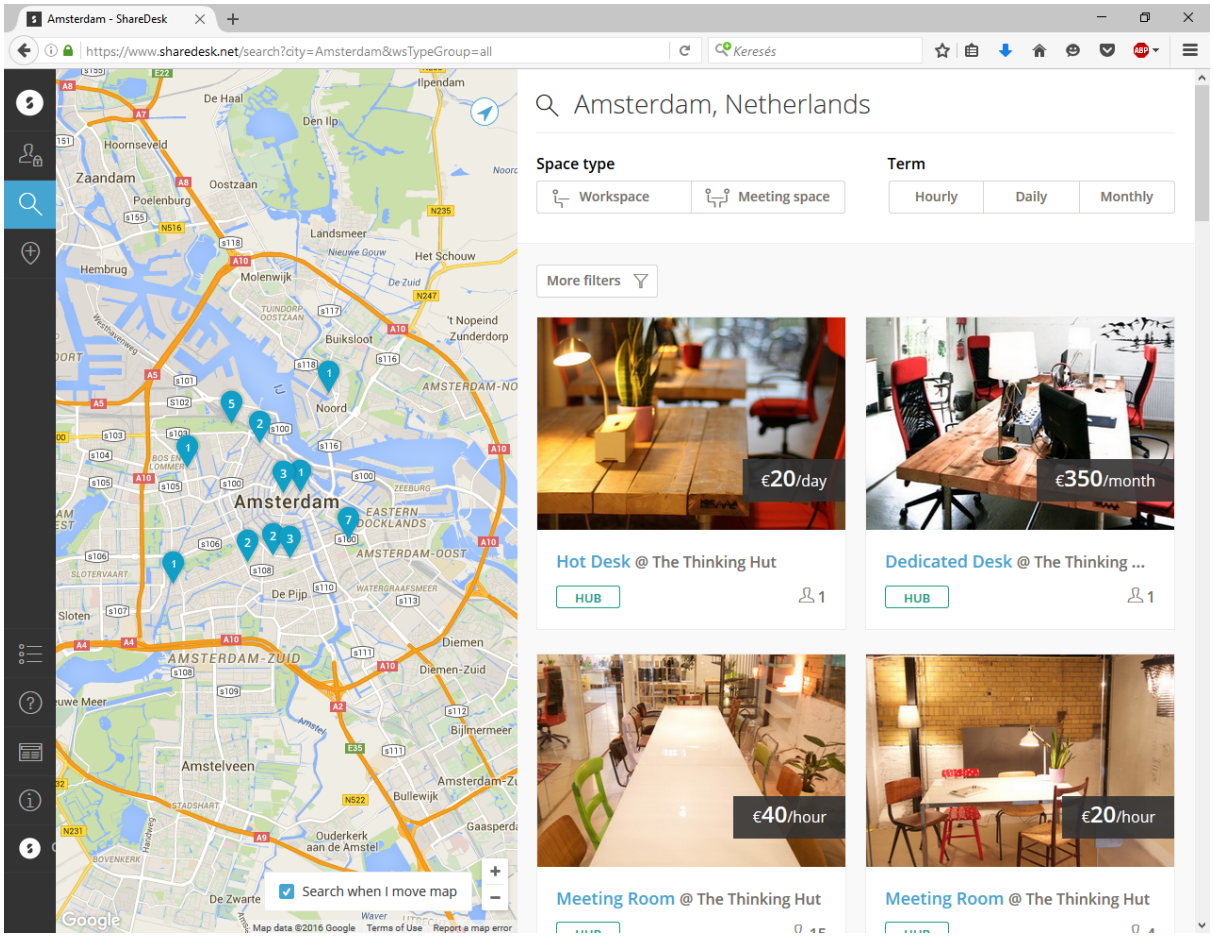
[1] https://scrapy.org/

[2] https://www.python.org/

kind of data is possible to handle with it, the second is the type of data. Next I tried to give answer how can we use that data and the last two columns is a navigation where can be these topic found in the dissertation.

The main idea was to create two web spiders: one that extracts the urls for the crawling and another for the individual webpages. However, the main screen of Sharedesk.net (Figure 1.) contains all the coworking offices in the area, but the area is limited isn't possible to zoom out to see the whole world.

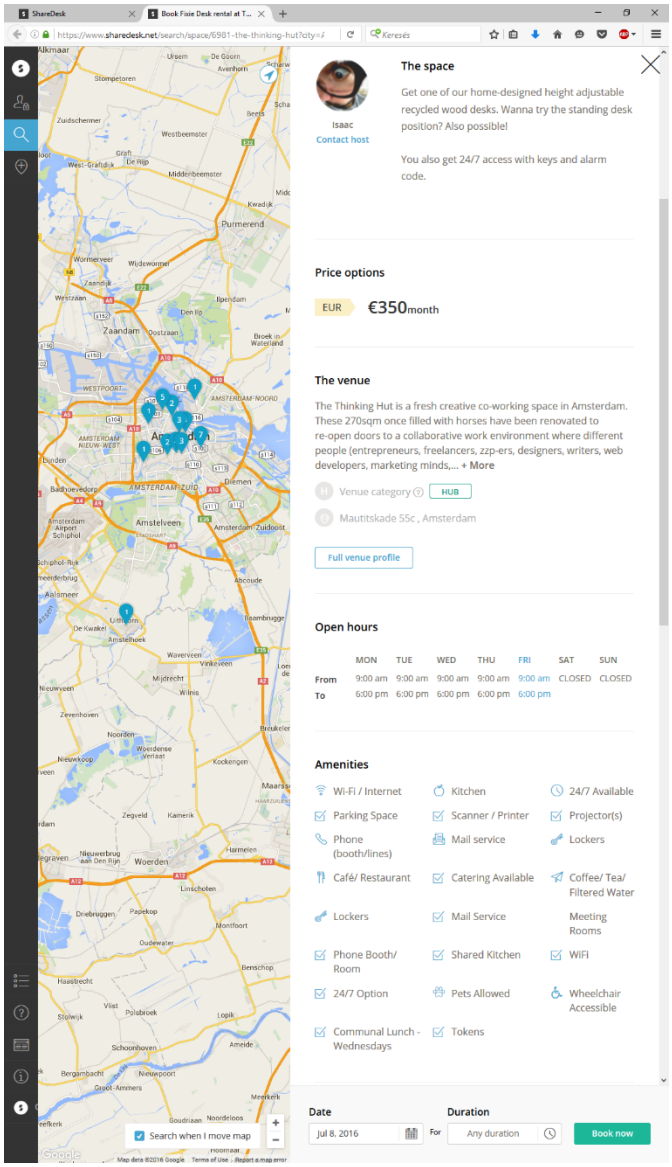
Figure 1. - Sharedesk main screen



Source: Own construction (2016)

So I needed to think differently to get the individual webpages (Figure 2.). In the url is www.sharedesk.net/search?city= so there will be possible to add city names from a dictionary but it sounded too complicated.

Figure 2. – Webpage of a coworking office on sharedesk.net site



Source: Own construction (2016)

If I clicked on an item I saw that the url changed like this: https://www.sharedesk.net/search/space/6983-the-thinking-hut?city=amsterdam&wsTypeGroup=all and this gave me the idea, why not to check is there a unique ID for the venues. It worked so I created a url generator script instead the first web crawler, which created the url with growing id number from 0 to 10000 in a csv file. According the computer processing capacity, it was no issue to have this number and it was quicker. If an ID is no longer used there will be a 404 page, which I removed during the processing from the extract file.

I made the real web crawler really simply, it red the csv file with the urls and extracted a JSON code from the webpages. The web crawling was conducted in 2015 summer. It took two days to finished, because I used artificial delay between two webpage requests, to avoid IP address banning for Denial of Service (DoS) attack.

The crawled data was heavily processed. First I created a script to change a JSON to CSV, the header of the table was the keys of the JSON file. It was too big to handle so I used SQLite instead Open Office to store the data in preferred structure and format.

To explore the dataset I used Pandas[3], which is a popular Python package for data science and IPython Notebook[4]. It is so effective, to load the data from the database and create a correlation matrix on the data needs only 5 lines of coding.

Hypotheses

I had the following hypotheses:

The theoretical hypotheses

1. The creative nodes are a new developing force in the economy, parallel the land, capital, labor, innovation and knowledge. In the age of the info communication technology the creativity needs a new kind of approach, because it depends on the traditional resources and it impacts the economical environment. It causes a spillover effect in space and this transforms the cities.
2. The creative node causes concentration in space. The digitalization and the internet made the distances shorter, the digital space made the physical space less matter. However, the new kind of space usage makes nodes more important than before. The space becomes the center of innovation, it influences the people. Urbanization becomes faster, people from the smaller cities migrate to node region and to city centers. These processes and the evolution of technology changes the number and the speed of communicational transactions, the reuse of downtowns leads to a new gentrification.

[3] https://github.com/pandas-dev/pandas
[4] https://ipython.org

Space and creativity, the empirical hypotheses

3. To describe the creative node as a new entity, the best way is to use creative methods and the attributes of creative people, workplaces and spaces. In my dissertation I tried to define these three factors: people, workplaces, spaces. In the empirical part I tried to find them in the world with web mining, where are they located and is there any geographical density.
4. The creative nodes appear in places with strong economic resources and history, not in places with high urban density nor in newly created city parts. I used text mining on the dataset to analyze the city structure.
5. The creative nodes are made with the interactions between the creative class, the workplaces and their local spaces. Creativity cannot be standardize via city type or based any statistical data.

Structure of the dissertation

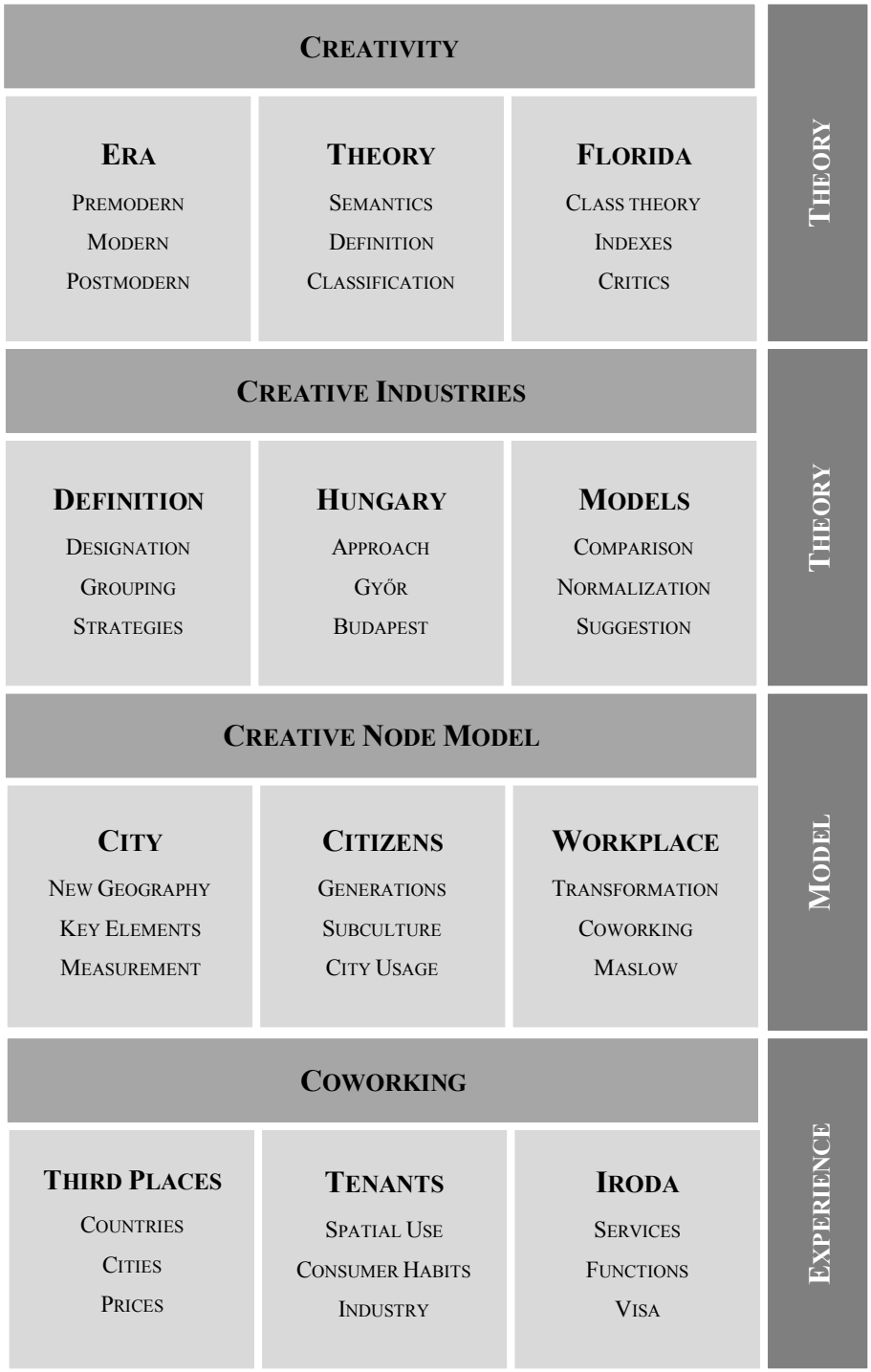
I followed the guidelines of the Doctoral School to create the structure of my dissertation with a triple fragmentation (Figure 3.):

- theoretical chapters (2. and 3.),
- model creating chapter (4.),
- empirical chapter (5.).

The spatial effect of creativity in a triple unit follows the three introduction chapters (2., 3., 4.), like:

- cities and places (4.2.1.),
- the people as the creative citizens (4.2.2.),
- creative workplaces and offices (4.2.3.).

Figure 3. – Structure of the dissertation



Source: Own construction (2016)

To present the background of creative economy first I placed creativity in time context, because each era from the premodern to postmodern, the word creativity had a different meaning. The modern age changes the speed of the development of humankind via technology and industrialization. However, it is not a linear progression, that is the reason I present

Kondratieff's cycle theory and how the cycles effects the creative people, generations, city usage and consuming behaviors. After that I define the concept of creativity. There are plenty of definitions for the creative economy and creative industries, so at first I used a semantic approach. After that I continue with the most controversial figure of creative economy: Richard Florida. He created a new class theory, the creative class, new indexes and a new model called 3T. During the literature review I felt that lot of the sources only present the part of Florida's work, so I tried to give a complete overview from it. The creative industries are not just a theory, almost each country of the world are using it in practice, I presented nine different approaches, then I compared them with the European Union's NACE (Rev. 2.) classification and after two rounds of normalization I created my own creative industries table.

I created my own model for the spatial effect of the creativity, I named it the creative node. Unlike other creative economy models I used soft components. The first component are the creative places with the theoretical background from creative cities and Oldenbourg third places theory. The second component is the creative people, citizens, the middle class of the postmodern age. I gave an overview about them, what generations, subcultures do they belong, how they stopped using driving cars, how they helped old and unused city parts to reborn. The third component is the workplace, how it changed in the inside (like it is completely normal nowadays to have a sofa in the office) or how they create a creative milieu for the employees, where they can be creative and innovative.

I think coworking spaces are the symbols for these three components simultaneously, and with the computer programming based method I collected data of over 7000 spaces. The empirical part is also in triple unit:

- In the first part I try to demonstrate that the coworking spaces are also third places, I compared the self-description on of the spaces with Oldenburg (1999) publication, and I also made a price comparison between the price of a coworking space and the price of third spaces.
- After that I started to analyze the spatial data of the coworking spaces and compared it to Florida's 3T model. The second component of the creative node model the creative people, so I compared users of coworking spaces with Florida's creative class. Then I used text mining to have an understanding what kind of city part to these people are using.

— The last component is the creative workplace, so the last empirical chapter is about to compare coworking spaces to creative workplaces and what kind of services do they offer.

The final chapter is the summary of the results.

The creative node model

During the creation of the creative node model my focus was to give spatial description to the creativity. *Florida* (2002, 2005, 2011) often cites Jane Jacobs, who was focusing on the small parts like the sidewalks, the streets, however he never focuses in these smaller parts. Florida measures the creativity of countries, cities, but my opinion is that we should look deeper. The creative node model (Figure 4.) is a new theoretical approach to describe the spatial effect of the creative economy.

Figure 4. - The creative node model

Source: Own drawing (2016)

The creative node is a city quarter where people like to live, work. The creative node is a mixture of:

- creative people,
- creative workplaces,
- and creative places.

There are already existing such kind of terminologies:

- *„science city”* (*Evans*, 2009),
- *„creative city”* (*Evans*, 2009),
- *„culture city”* (*Evans*, 2009),
- *„creative space”* (*Brouillette*, 2007),
- *„space of flows”* (*Brouillette*, 2007).

My approach is different I focus on the smaller parts like quarters, districts of a city. Of course there are places where not all the elements are existing, so if one of the elements are missing then I call that places:

- startup centers,
- gentrification,
- creative city quarter.

Summary of the results

In the introduction part I made five hypotheses:
Hypothesis no. 1: The creative nodes are a new developing force in the economy, parallel the land, capital, labor, innovation and knowledge. In the chapter 2.1. the presentation of the postmodern world is with the aim to prove that the development of the world is no longer linear, it could be parallel. The creative node has three factors that strengthen each other in synergies, I give complete details about them in the chapters 4.2.1., 4.2.2. and 4.2.3.. The creativity is not one dimensional, because the creative class change the way of using space and cities, they work

more efficiently, with the modern technology they could work anywhere, anytime. This leads to bigger profits and income. So if somewhere a creative node starts to grow it will lead to a multidimensional growth.

I believe my hypothesis is correct.

Hypothesis no. 2: The creative node causes concentration in space. The digitalization, internet made the distances shorter, the digital space made the physical space less matter. However the new kind of space usage makes nodes more important than before. The space becomes a center of innovation, they influencing the people. After examining in the chapter 4.2.1. the creative cities of the postmodern age, we can define the type of cites what attracts the creative class. In the chapter 4.2.2. I show how these people are using the space in the city, how they rediscover cycling, how they move back to the city and gentrification gives new life to abandoned places. In the chapter 4.2.3. workplaces, I present that the world is not flat, no matter of the new technologies like high speed internet and wireless networks, people do not like working alone, they want to be part of a community. It the chapter 2.3.3. Critics of Florida the main argument against the creative class and the creative cities that we cannot decided that creative cities attracts creative people or creative people transforms cities to creative cities. However we can say that creative people looking for the company of creative people, this leads to creative transactions with the usage of physical space.

I believe my hypothesis is correct.

Hypothesis no. 3: To describe the creative node as a new entity, the best way is to use creative methods and the attributes of creative people, workplaces and spaces. To prove this hypothesis I examined the physical distribution of the coworking offices. The first step was to prove that coworking offices are representing the creative nodes with using Oldenburg third place theory. In the chapter 5.2. I prove using Deskmag's data that between the members the creative class is overrepresented and in the chapter 5.3. coworking as a workplace that the creative professions are overrepresented. In the chapter 5.1. I present the distribution of the coworking spaces in the physical space and the result is that the distribution is not evenly.

I believe my hypothesis is correct.

Hypothesis no. 4: The creative nodes appear in places with strong economic resources and history, not in places with high urban density nor in newly created city parts. I used text mining on the dataset to analyze the city structure in the chapter 5.2. After making a classification on the dataset I found 70% of the spaces are in the downtown part of a city. I validated it with the research results of Deskmag, they counted 76%. The coworking spaces in suburban part are often brownfield investments.

I believe my hypothesis is correct.

Hypothesis no. 5: The creative nodes are made with the interactions between the creative class, the workplaces and their local spaces. Creativity cannot be standardize via city type or based any statistical data. Although I used a creative methodology for data collecting and analysis, it was a descriptive analysis, but the cause of the relationship I could not reveal.

I believe my hypothesis is not correct.

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