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## THE ROLE OF INTERNET RESOURCES IN STUDYING THE RENTAL HOUSING MARKET

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*The article is devoted to the analysis of the online rental market in the United States, in particular, the web resource Craigslist. Advantages and disadvantages of the Craigslist are compared. Much attention is paid to the importance of online rental listings in rental market scientific research.*

The aim of the article is to determine the importance of the online rental market for its analysis and study by researchers using the example of Craigslist [1], which is the most common online source of rental offers in the United States.

The share of American households renting housing is increasing every year, and at the same time it is the online part of the rental market that currently dominates. This is evidenced by the data from the 2017 American Housing Survey, which found Craigslist to be the most popular way to find rental housing in the United States. Craigslist was founded in San Francisco in 1995 by C. Newmark as an online classified advertisements service. As of 2019, Craigslist was the 15th most visited website in the United States and is practically a monopoly in online rental listings space.

The issues of the online rental market in the United States have been discussed in the scientific community from 2006 to the present day, which confirms the topicality of the article. In October 2006, L. Gordon, who is the New York City Council Legislative Investigator, published a report entitled "Brokered Deception: The Hidden Perils of Online Real Estate Ads". Thereafter some researchers began to study the Craigslist rental listings in the context of landlord discrimination and the Fair Housing Act.

However, many scholars and practitioners have taken Craigslist from another angle, using it as the most comprehensive dataset available to study the USA rental market. For example, A. Mallach used Craigslist listings to estimate the median rent in Phoenix in 2010. J. Wegmann and K. Chapple consulted a sample of Craigslist listings to study the prevalence of secondary dwelling units in San Francisco in 2013. Also, J. Feng web-scraped 6 000 Craigslist listings to study Seattle's housing market in 2014 [2].

Despite Craigslist listings have become the primary means of information exchange in the USA rental market, some literary sources question the representativeness of the website's data and consider it as one of the phenomena of the information inequalities.

According to various social surveys among the USA population, the desire to own a home has been and remains strong. However, American households are increasingly turning to the rental market because home ownership is associated with many risks, including the potential loss of wealth from falling real estate values, high costs of relocating and the financial and personal havoc caused by foreclosure.

For most households renting is less of a financial stretch than buying a home. Even in the best of times, homeowners have to come up with a substantial amount of cash to cover the down payment and closing costs, as well as the expense of any immediate repairs. While renters typically have to pay a security deposit plus the last month's rent, the total outlay is usually more modest than the upfront costs of buying. The Federal National Mortgage Association survey reveals many of the reasons some households favor renting over owning. More than half of the renter respondents considered renting a better choice for living within a budget and having less stress. Other common reasons cited for preferring to rent are that it is the best decision in the current economic climate, it allows one to live in a more convenient location, and provides more flexibility in future decisions [3].

Assuming that housing bundles (in terms of the house and neighborhood characteristics) are the same, the cost of renting (the present value of rent payments over a holding period of identical length) simply needs to be subtracted from the user cost of owning to decide which is better. If it is a positive number, owning makes more sense, and if it is a negative number, renting does [4].

Thus, in both the United States and the Republic of Belarus, economic conditions, credit market conditions and housing market conditions clearly have a significant impact on decisions about whether to become a homeowner or rent a home. Now people can easily use the Internet to locate online tools to compare the costs of owning and renting.

However, in the United States there is an acute problem of inequality for certain communities, including inequality in the provision of information. J. Boeing, in one of his academic papers, analyzed 11 million online rental advertisements using a website scraping technique and found that they were spatially concentrated and overrepresented whiter, richer and more educated communities. While Craigslist contains valuable crowdsourced data

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to better understand affordability and available rental supply in real-time, it does not evenly represent all market segments [5]. Although the problem of inequality in society is not exacerbated in the Republic of Belarus, using the method of website scraping, following the example of J. Boeing's work, it is possible to develop a methodology for determining the representativeness of regions and districts in certain online sources of the rental market.

One of the advantages of Craigslist is that it increased market efficiency by lowering search costs, thus reducing the average time for units to lease by three weeks [2]. However, this is not the main benefit for researchers, but the fact that it is the most comprehensive data set currently available to examine the USA rental housing market.

Many local governments of the USA face the challenge of addressing the shortage of affordable housing. Despite the importance of the USA rental housing market – particularly in the face of a critical shortage of affordable housing in many cities – there are no comprehensive data sources capturing its full scope. Most data used by housing planners comes from two sources. The first source is associations of apartment managers and brokers that focus on large apartment complexes. These commercially maintained data sources are valuable, but provide insufficient information about significant segments of the rental market. The second source is the Census Bureau's American Community Survey, which is an invaluable resource for social scientists studying small-scale demographic variation. However, it represents a very small sample of households and can produce inaccurate data [2].

In this way, planners try to get up-to-date rental data locally. Professionals looking to track and gain insight into trends across the entire spectrum of this market have not been able to do it so effectively using existing data sources. The Craigslist data provides real-time information for planners in measuring local rental markets which are updating faster than statistics are released to understand local conditions and proactively respond to emerging issues, including accessibility issues. The Craigslist data provides information, disaggregated to district scale, on apartment characteristics such as apartment size and number of bedrooms. The American Community Survey's average rent does not tell planners how much a family of four persons have to pay this month to rent a three-bedroom apartment. Method of website scraping allows to analyze the Craigslist data by region to assess several housing market characteristics, including distributions of rents, area and rents per square meter.

For example, the study by University of California researchers G. Boeing and P. Wadell about rental affordability models combined the Craigslist dataset with estimates of Fair Market Rent from the Department of Housing and Urban Development and the American Community Survey's 1-year estimates of median household income and resident population. They found out that on average across regions the median rent in the filtered dataset is 7 percent higher for one bedroom, 3 percent higher for a two-bedroom, 7 percent lower for a three-room unit, and 1 percent higher for four-room units than the corresponding median rent from the Department of Housing and Urban Development. They also found out that the bias varies between regions and number of bedrooms: in New Orleans and Oklahoma City the median rents for the two datasets are very similar, while in other regions, such as Las Vegas, the median rents in the dataset Craigslist is significantly lower, whereas the average rent in New York, according to Craigslist, is considerably higher [2].

Thus, the developed methodology makes it possible to analyze data both in the required spatial scales and according to certain selected characteristics. In addition, the described methodology can be easily used in other projects and studies. Web scraping and related techniques can analyze and visualize huge amounts of data from the Internet. A large amount of information is useful only when it is really collected, analyzed and understood.

Based on the experience of American researchers, there is an opportunity to study the rental housing market in the Republic of Belarus. Using data from the Internet resource Realt.by, a correlation analysis of 180 units of apartments offered by tenants (20 units in each district of Minsk) was carried out. To obtain a computational model, information was collected from the entire sample and analyzed by 21 factors. The aim of this project was to build a pair correlation matrix to determine the degree of influence of various factors on the amount of rent for an apartment in the city of Minsk.

As a result, it turned out that the factors which have little influence on the amount of rent are the presence of grocery stores within walking distance (2.4%), the view from the window (7%) and the proximity of recreational areas (10.3%). The most significant factors, which is not surprising, are the number of rooms in the apartment (61.1%), the technical equipment of the apartment (52.3%), the state of repair (49.5%), the furnishing of the apartment (46.71%), the kitchen area (36.3 %) and the cadastral value of the land plot on which the residential building is located (34.4%). It was a surprise that the distance to the subway and the factor of transport accessibility are not decisive (20.3% and 24.1% respectively). Various studies can be carried out based on online rental listings and obtained results can be used to further build a mathematical model to assess the market value of rental housing from the available characteristics both in the city of Minsk and in the Republic of Belarus as a whole.

The analysis of research on the online rental housing market in the United States has revealed a number of different views and illustrated the advantages and disadvantages of the online rental source and its contradictions. Even though Craigslist listings provide advertised rents, not final negotiated rents in legal contracts,

researchers have been able to develop methodologies for obtaining and processing website data for analysis and urban planning. Therefore, having studied the online rental housing market in the Republic of Belarus and based on the analysis of supply the principles of formation and development of rental housing in the Republic of Belarus can be considered, as well as proposals and measures for the development and management of the stock of residential premises can be developed.

Studying the rental housing market using Internet sources is an up-to-date and affordable method. Such studies have been carried out not only in the USA. In 2015 A. Raey looked at eight hundred thousand user-generated housing searches on the British site Rightmove to study the geography of submarkets. Belarusian scientists and researchers can also use web sources to study the rental housing market, because online rental advertisements are widespread, especially in regional centers. Examples of such websites are Onliner.by, Realt.by, Hata.by, etc. At the same time, the disadvantages of the online rental housing market, identified by American scientists, can be considered in similar investigations of the Belarusian rental housing market.

Planners should use the latest methodology and data in planning technology and have the necessary technical skills and interest to do their job. The UC Berkeley Master's Course in Urban Informatics and Visualization develops these skills and a similar discipline or course project could be considered at technical universities in the Republic of Belarus within the Civil Engineering or Architecture faculty.

Thus, after reviewing the issue of the role of Internet resources in studying the rental housing market, it can be argued that there is a number of researches in this area. However, it is necessary to conduct even deeper investigations to study various economic and social aspects of society and the state.

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