QUANTITATIVE RESEARCH OF BUILDING AMENITIES IN PANEL BLOCK BUILDINGS IN THE CZECH REPUBLIC

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Abstract: This paper deals with the issues of the building amenities of panel buildings from the perspective of the realistic usability by the residents. To determine the weighted user comfort, the paper used, as general input methods of processing the issue, descriptive statistics, or more precisely put, qualitative research. This method was chosen for its best informative ability to arrive at certain results based on an in-depth comprehension of the details. The subject is very timely and necessary, with respect to the necessity of regeneration of the housing inventory in the Czech Republic. This is not just a theoretical problem, but must also be addressed in practice.

Keywords: panel building, building amenities, quantitative research, usability.

1 Introduction

1.1 Working Hypotheses

Hypothesis_1
The current demands for the existence of building infrastructure in (panel) apartment buildings are directly proportional to their originally intended functions.

Hypothesis _2
The real usability of building amenities in (panel) apartment buildings is greater or smaller depending on the size of the apartment units.

Hypothesis _3
There exists a relationship between the placement of the selected building amenities within the context of a (panel) apartment building and its real usability.

1.2 Work Methodology

Table 1: Description of data collection in quantitative research. (Punch, 2015).

Quantitative data collection
Research sample of people is a large number of respondents
Performed primarily using questionnaire surveys
Examines the issues tangentially
Not time demanding
Deduction[1] from the results
Statistical processing of data

[1] Deduction = is a process of judging in which assumptions lead to conclusions that are reached from these assumptions, whereas the derivation is certain, not merely probable. It is therefore the basic procedure for proof.

1.3 Quantitative Research

Data collection using standardized questionnaires (focused on confirmation or refutation of hypotheses 1 – 3) on building amenities in apartment buildings.

For data collection, the Netquest.cz, portal was used, which is publicly accessible and so ensures a wide range of respondents.

Quantitative methods are best suited to exploring simple and measurable traits, or combinations thereof, in large and more or less homogeneous populations. For more complex and unmeasurable indicators, it is necessary to scale, and their reliability and comparability naturally fall, especially if the questions are not formulated unambiguously. Therefore, quantitative methods are combined with qualitative (Punch, 2015).

1.4 Research Methods

CAWI (Computer Assisted Web Interviewing) or On-line querying

- the fastest and most affordable method of surveying in quantitative research
- interviewing is via the Internet, the respondent fills in the questionnaire directly on the website (Netquest.cz)
- Respondents' responses are automatically sent to the email owner of the questionnaire where they can be continuously checked during the data collection
- the main advantages are speed, low financial cost, possibility to include multimedia materials and easy error correction in the questionnaire

PAPI (Paper and Pen Interviewing) or personal questioning

- is more flexible than written questionnaires- allows one to add observations
- the sampling structure is carefully selected by the interviewer and there is no problem with returns of the questionnaires
- A competent interviewer inspires interest in answering and explaining even more demanding questions and notes open answers
- a potential negative factor that may have an impact is the respondent's concern about the loss of anonymity and the resulting inhibitions.
- as a non-standardized interview, it approaches qualitative methods, as it examines the respondent's motivation and gives him room for more extensive expression (CAMPBELL, 2014)

2 Identification of the Issue According to Examination of Public Materials Available on the Issue

During the period of construction of apartment buildings, it was common for every new building to have building amenities that designed for it and also used extensively, whereas nowadays these spaces rarely fulfill their originally intended function.

The design of a building was meant to always be a natural response to the needs of a user whose housing requirements change over time.

The question arises as to whether the purpose of building equipment should be totally restricted by fixed principles as defined by the standard, or should be more focused on real use and respond to the changing needs of the user.

Prior to the design (reconstructions) of the layout of a building and apartment, it is necessary to clarify the demands for operating relationships, functional and across-the-board requirements. (OSTANSKA, 2019)

It is also necessary to realize that the form of housing determines the purpose of the building amenities of apartment buildings, in particular with respect to the highest possible profit.

3 Research

Quantitative research consists in examining relationships between variables, how variables depend on each other, and why. This will help to establish the conclusions of the predetermined research hypotheses 1 - 3 and then to meet the objective - the proposal for measures and recommendations for solving individual identified problems (see previous section).

Variables of quantitative research for assembling the questionnaire:

1_Demographic information
  (>60 years old; 45-60 years old; 30-44 years old; 20-29 years old; 15-19 years old)

2_Permanent residence
(Prague; Central Bohemia Region; South Bohemian Region; Pilsen Region; Karlovy Vary Region; Ústí Region; Liberec Region; Hradec Králové Region; Pardubice Region; South Moravian Region, Olomouc Region; Zlín Region; Moravian-Silesian Region)

3_Housing type
  (brick building, panel building)

4_Form of housing
  (private ownership, leased housing, cooperative housing, other use of apartment)

5_Size of apartment
(1+0; 1+kk; 1+1; 2+kk; 2+1; 3+kk; 3+1; 4+kk; 4+1; larger than preceding, atypical layout)

6_Existence of building amenities
(mailbox; baby carriage and bicycle storage room; waste placement; basement storage units; utility room; heating equipment rooms; parking areas; storerooms for maintenance, laundry room, laundry drying room, ironing/mangle room; cleaning utility room; rug beating room; social gathering room; modification of flat roofs)

7_Real usability of building amenities
(mailbox; baby carriage and bicycle storage room; waste placement; basement storage units; utility room; heating equipment rooms; parking areas; storerooms for maintenance, laundry room, laundry drying room, ironing/mangle room; cleaning utility room; rug beating room; social gathering room; modification of flat roofs)

8_Sufficiency of building amenities
(baby carriage and bicycle storage room; basement storage units; utility room; storerooms for maintenance, laundry room, laundry drying room, ironing/mangle room; cleaning utility room; social gathering room; modification of flat roofs)

9_Necessity of building amenities
(mailbox; baby carriage and bicycle storage room; waste placement; basement storage units; utility room; heating equipment rooms; parking areas; storerooms for maintenance, laundry room, laundry drying room, ironing/mangle room; cleaning utility room; rug beating room; social gathering room; modification of flat roofs)

10_Functions of building amenities
(mailbox; baby carriage and bicycle storage room; waste placement; basement storage units; utility room; heating equipment rooms; parking areas; storerooms for maintenance, laundry room, laundry drying room, ironing/mangle room; cleaning utility room; rug beating room; social gathering room; modification of flat roofs)

11_Preference of location of space for storage of items found outside of the apartment
(on the ground floor of the building by the main entrance - unit/room for every tenant in the building; on the ground floor of the building by the secondary entrance - unit/room for every tenant in the building; in the basement spaces in the basement of the building - unit/room for every tenant in the building; on the floor near your apartment - unit/room for every tenant of the given floor; in the attic - unit/room for every tenant in the building; in separate spaces in close proximity to the apartment building - unit/room for every tenant in the building; other)

12_Improvement of the state of building amenities
 (general opinion of respondents – open-ended question)

3.1 Data Collection

Using the CAWI and PAPI methods
A questionnaire entitled Exploration of Usability and Spatial Effectiveness of Building Amenities of Apartment Buildings was publicly available on the Netquest Portal to create a wide range of respondents from May – October 2018 (Portal for creating and publishing surveys in the form of questionnaires). The number of completed questionnaires is 150 - it can be said that this number is more than sufficient for the relevance of quantitative research. (Punch, 2015)

4 Result of Questionnaire Survey

1_Age structure of respondents:
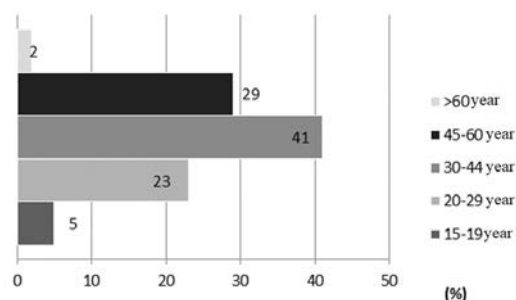
Graph 1: Age structure of respondents. Author's design.

This question could be viewed as the age structure of the respondents, which, of course, is important from a demographic point of view in any questionnaire survey. It is clear from the Graph that most of the respondents who submitted the questionnaire fall into the age group of 30-44 years old, regardless of gender. Another notable group is the 45-60 years old group and also 20-29 years old, all age groups of respondents of working age. These results could further be used for other demographic calculation methods for the population structure that are not currently the subject of this research design.

2_Permanent Residence of Respondents:
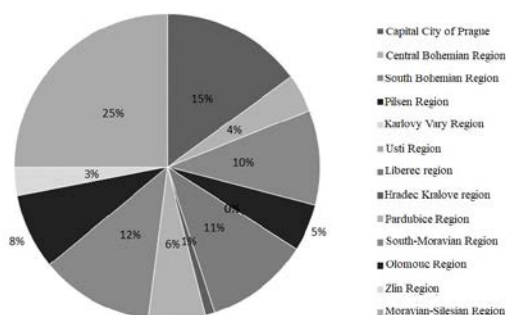
Graph 2: Permanent residence of respondents. Author's design.

It is evident from the graph that the largest number of respondents is permanently resident in the Moravian-Silesian region. Other regions with notable values include the City of Prague, the South Bohemian Region, the Liberec Region, the South Moravian Region and potentially also the Olomouc Region. For the other regions, the numbers of the questionnaires returned are too small and, therefore, within the region, the responses to the survey would not have a meaningful value, but of course they are of value in the nationwide evaluation.

3_Type of Housing/Apartment Building:
Based on the responses, it can be said that the greatest number of respondents live in apartments in panel buildings (62%). Proportionally, this is almost double the number of residents living in apartments in brick buildings.

4_Form of Housing:
From the responses to the question of form of housing, it is clear that the majority of the respondents live in cooperative-owned apartments (53%), which is a certain form of leased housing. Lease apartments make up the second-largest group of this survey (31%).

5_Size of apartments of the respondents according to floorplan:
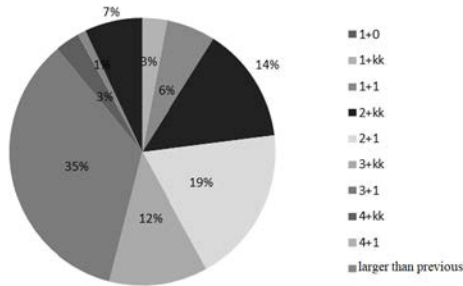
Graph 3: Apartment floorplans of the respondents. Author's design.

From the survey results, it is clear that the largest number of respondents live in a 3+1 size apartment (3 bedrooms + 1 kitchen), which is 35% or 52 people. The other most frequently inhabited apartments of the respondents according to size are 2+1 with 19%, 2+kk with 14% and 3+kk with 12%. The apartments of other sizes together make up approximately 20%, whereas this usually means apartments of a smaller size, and just 3% of the whole are 4+kk sized apartments. Residents of larger apartments did not participate in the survey.

6_Existence of Building Amenities in Apartment Building of the Respondents:
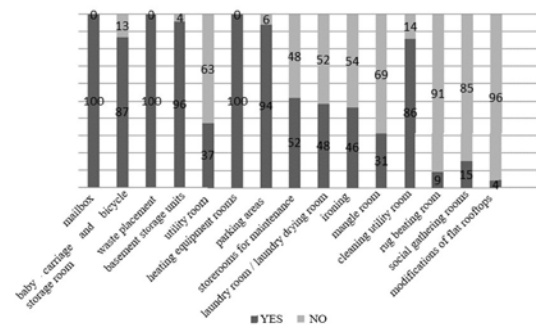
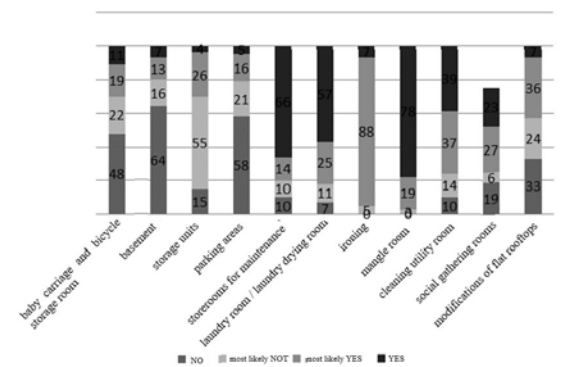Graph 4: Existence building amenities in Apartment Building of the respondents. Author's design.

7_Real Usability of Building Amenities in the Apartment Building of the Respondents (under the assumption of their existence):
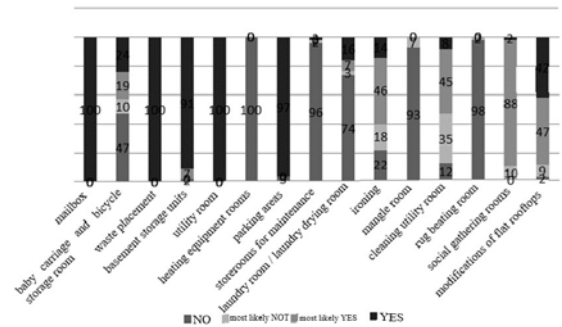
Graph 5: Real Usability of Building Amenities in the Apartment Building of the respondents. Author's design.

From the two previous Graphs, it can be inferred that building amenities such as mailboxes, waste disposal, basement storage units, utility rooms, parking areas, and assembly areas, if they exist in the building, are 100% or almost 100% realistically used. On the other hand, building amenities such as heating equipment rooms, maintenance, laundry, mangles, and rug beating rooms are almost not used at all in the apartment buildings. Other residential equipment is used in a variety of ways, for example, depending on the location, number of the respondents or the structure of the inhabitants of the residential building.

8_Sufficiency of Building Amenities for the Needs of the Respondents:

Graph 6: Sufficiency of building amenities for the needs of the respondents. Author's design.

It is clear from the questionnaire survey that some types of building amenities predominantly do not suit the needs of residents of the apartment building. These include, among others, mainly a baby carriage and a bicycle storage room, basement storage units, parking areas and flat roofs (but only in the case of 4% of the respondents).
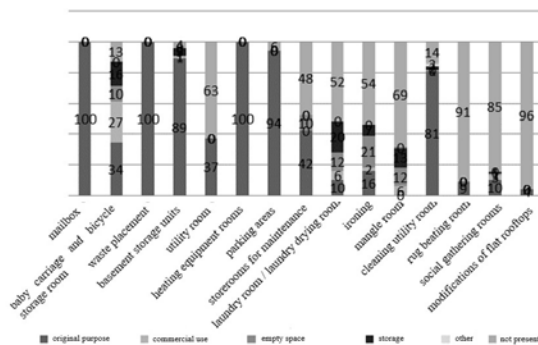
9_Necessity of Building Amenities in the Apartment Building of the Respondents:
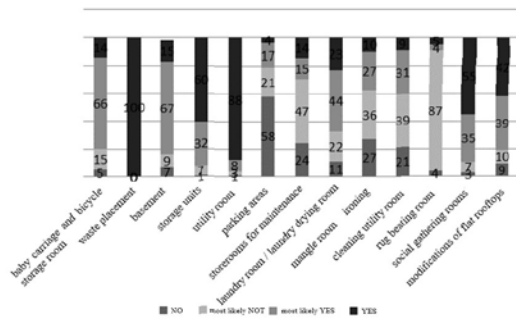
Graph 7: Necessity of Building Amenities in the Apartment Building of the Respondents. Author's design.

If spaces such as baby carriage and bicycle storage rooms, waste placement areas, basement storage units, utility rooms, parking areas, laundry drying rooms, gathering areas and modified flat rooftops are located in the buildings of the respondents (assuming that they do exist), they would use these spaces.
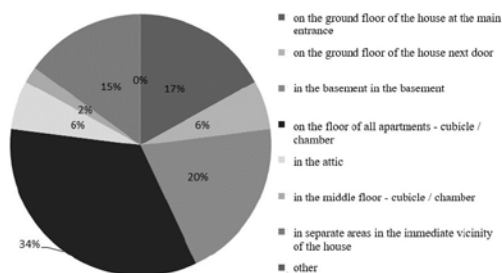
10_Functions of Building Amenities in the Apartment Building of the respondents:

Graph 8: Functions of building amenities in the apartment building of the respondents. Author's design.

According to the statements of the respondents, the original purpose of the building amenities, as designed at the time, is today only fulfilled by the mailbox, the waste placement area, heating equipment rooms and parking areas. Predominantly also the basement storage units.

11_Location of Storage Space for Items in the Apartment Building of the Respondents:

Graph 9: Location of Storage Space for Items in the Apartment Building of the Respondents. Author's design.

From the graph, it can be inferred that 34% of the respondents would wish to have a storage space for items in the apartment building, or potentially in the basement of the building, such as are basement storage units (20%), on the ground floor of the building by the main entrance (17%) or also in separate spaces in close proximity to the apartment building (15%).

12_Open Question: In your opinion, how can the situation of building amenities in the apartment building be improved?

This was the only question open to the respondents to be answered in up to 20 words. To this final question, the respondents responded almost in the same way regardless of their permanent residence, the size of the apartment or the usability and the spatial efficiency of building amenities. By requiring more storage space in the apartment or outside the apartment and their large area, more parking spaces, and, most importantly, about 70% of the respondents considered security to be the most important. They talked about security in conjunction with building amenities, front doors, but also the neighborhood of the apartment buildings.

Partial summary of the questionnaire survey:

▪ When present in the apartment building, the following are actually used:
- Basement storage units and storerooms (insufficient for the needs of residents)
- Parking areas (insufficient for the needs of residents)
- Spaces for gathering (insufficient for the needs of residents

▪ When present in the apartment building, the following are not actually used:
- Laundry rooms (empty space, storage)
- Mangles (empty space, storage)
- Other building amenities (e.g. baby carriage and bicycle storage - insufficient for the needs of residents) are used variously, for example depending on the location, the size of the apartment or the structure of the inhabitants of the apartment building.

5 Conclusion

The aim of this paper was to analyze the current state of the real usability of building amenities of panel buildings so that in the subsequent research it would be possible to propose measures and recommendations for solving individual, identified problems of building amenities of prefab housing, and their demonstration on selected concrete examples. Using work steps and comparisons of the results of quantitative research and documentation of the historical and current state of housing issues in residential (panel) buildings, the requirements for building amenities in prefabricated apartment buildings for weighted user comfort have emerged. By analogy we can apply the acquired knowledge to panel buildings of the same categories and most of their modifications that do not differ in the location and existence of building amenities. However, for example, the effects of the different spectrum of residents of such buildings and forms of housing cannot standardize and generalize the requirements for building amenities. The human factor introduces a completely different, almost philosophical dimension to this question.

The concluding assessment must of course include a statement on whether the working hypotheses postulated at the beginning of the research were proven or not.

Hypothesis / 1
The current demands for the existence of building infrastructure in (panel) apartment buildings are directly proportional to their originally intended functions.
HYPOTHESIS WAS PROVEN

Hypothesis / 2
The real usability of building amenities in (panel) apartment buildings is greater or smaller depending on the size of the apartment units.
HYPOTHESIS WAS PROVEN

Hypothesis / 3
There exists a relationship between the placement of the selected building amenities within the context of a (panel) apartment building and its real usability.
HYPOTHESIS CANNOT BE PROVEN

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