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Problems of assessing the duration and cost of restoration projects on the example of Poland, Slovakia and Lithuania

Key words: existing structures, restoration works, duration assessment, cost assessment

Introduction

Assessing the duration and cost of projects involving the restoration of existing structures – particularly historical ones – is problematic. An incomplete state of knowledge about the technical condition of a structure and its historical substance can generate various additional and substitute work in relation to the work initially planned (Terlikowski, 2013; Śladowski & Radziszewska-Zielina, 2014; Radziszewska-Zielina & Śladowski 2017; Radziszewska-Zielina, Śladowski & Sibielak, 2017). It causes difficulties in estimating the duration and cost of a construction project (Huey-Jiun, Chien-Wei & Yi-Kai, 2008). It is also a frequent problem in the brownfield regenerations (Korytárová, Hanák & Lukele, 2017). In addition, due to the often unique character of the work and atypical construction conditions, we can encounter situations in which the assessment of the above-mentioned parameters can take place under conditions of uncertainty (Radziszewska-Zielina & Śladowski, 2017). In such cases, the uncertainty of the parameters being assessed requires the involvement of the knowledge and experience of experts who specialise in the process of the restoration of buildings, especially historical ones.

The paper features a presentation of the results of a survey study that provides information about how the problem of the assessment of the duration and cost

in such projects is being tackled in practice, on the example of projects carried out in three countries: Poland, Slovakia and Lithuania

Material and methods

Survey studies are a useful method of obtaining information that can be used, among other things, to justify wider analyses (Radziszewska-Zielina, 2008; Radziszewska-Zielina, 2011; Sobotka, Radziszewska-Zielina, Plebankiewicz, Zima & Kowalik, 2014). The survey study was performed in the form of a questionnaire. The authors developed the questionnaire of the survey study focusing on the assessment of the duration and cost of building restoration projects, including those involving historical buildings. The questionnaire was composed of two parts. The first contained filter questions about respondents' experience in the carrying out of these types of projects. The second part focused on the methods of estimating the duration and cost of the carrying out of these projects, as well as the need to consider additional funds for the performance of additional and substitute work, in addition to taking into account different scenarios of the carrying out of projects featuring the possibility of selecting an optimal scenario (in terms of duration and cost). The authors decided to choose a non-probabilistic sampling method – purposive sampling (Blalock, 1977; Babbie, 2007). The selection of the sample was made arbitrarily on the basis of the authors' knowledge of the subject of the research and their opinion regarding its appropriateness (Churchill, 2002; Wasilewska, 2008). The questionnaires were sent to three groups of respondents: developers, contractors and designers from Poland, Lithuania and Slovakia. The respondents were a selected group of experts chosen by a snowball sampling method. They had substantial experience either in the design or the carrying out of restoration projects, including those involving historical structures.

Results

A total of 38 properly filled out questionnaires were collected. Among the respondents there were 10 developers, 17 contractors and 11 designers, with 9 of the respondents being from Poland, 18 from Lithuania and 11 from Slovakia. The average experience of the respondents involving the carrying out of restoration projects – including those involving historical structures – exceeded 12.5 years (over 60% of the respondents had at least 10 years of experience). The respondents had carried out an average of 7 of these types of projects.

The respondents pointed to the methods of assessing the duration of restoration projects. The most popular method was the arbitrary assessment of the duration of restoration projects based on individual experience (59% of the responses about the most frequently used method of project duration assessment). The second-most popular method was preparing a schedule (27%) and the third – an index-based approach, e.g. on the basis of volume or usable floor area (8%). The results regarding the number of assessments performed using various methods according to their accuracy have been presented on Figure 1.
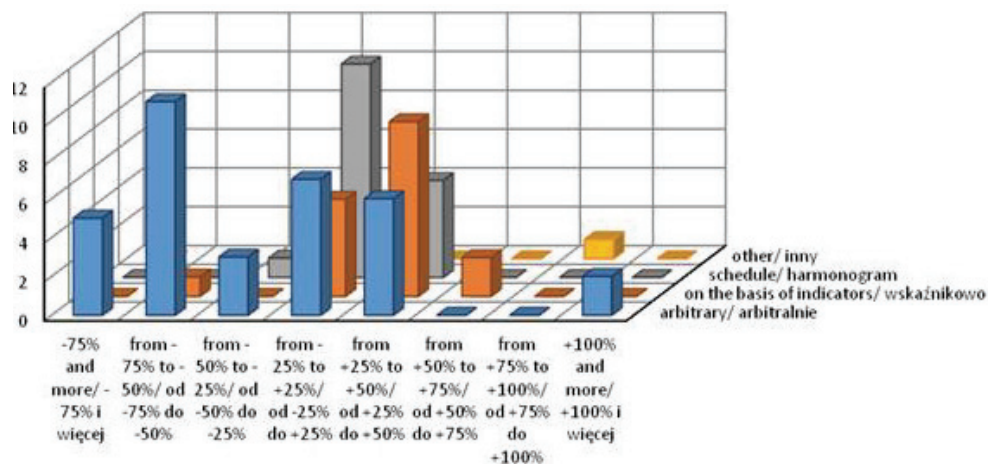
FIGURE 1. Listing of the methods and accuracy of the assessment of the duration of restoration projects

The respondents stated that in the case of preparing a schedule, the actual duration of the carrying out of a project had not been different from the projected duration by more than 25% in 65% of cases. In turn, in the case of the most often used arbitrary method of assessing the duration of a project, the difference of the actual and projected duration exceeded 25% . In most cases, the duration assessments intentionally included extra time. This means that planners were cautious in their projections. However, this led to situations in which a project would be completed over a duration that was a fourth of the estimated time. On the other hand, projects that lasted even twice as long as the projected completion time were mentioned in the questionnaire. Taking into account all of the aforementioned forms of assessing project duration, 66% of the results show differences between the actual and projected completion time in excess of 25%.

The respondents also provided answers to questions about the methods of assessing the cost of restoration projects

that they used. The method that was most often used was arbitrary cost assessment (47% of answers regarding the most often used form of cost assessment). Detailed calculation placed second in the listing (37%), simplified calculation placed third (13%), while the index-based approach placed fourth (3%). The results detailing the accuracy of each of these assessment methods have been shown on Figure 2.

The most accurate method of cost assessment was detailed cost assessment. In 80% of cases the actual cost of a project did not differ by more than 25% from the cost assessed using this method. In the case of simplified cost assessment, 70% of the results were in the +25% and +50% accuracy range in comparison to the actual costs of a project. The results for the most often employed arbitrary cost assessment method were reported to result in an at least 50% difference between actual and projected costs in 75% of cases. Similarly to the case of project duration assessment, cost assessment was performed with consid-
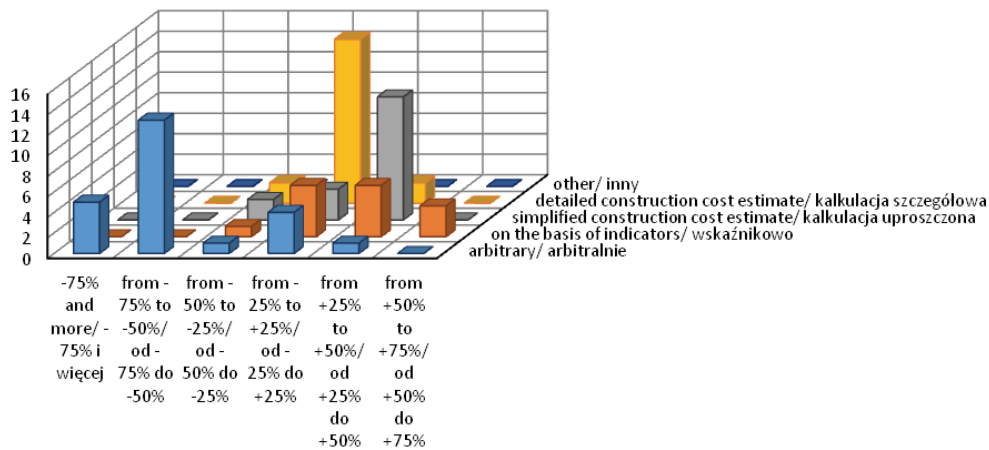
FIGURE 2. Listing of the methods of assessing the cost of carrying out restoration projects and their accuracy

erable reserves. When analysing all of the aforementioned forms of cost assessment, the authors observed that 63% of the results were characterised by differences between the actual and projected cost in excess of 25%.

Over half of the respondents indicated that they had not taken into account additional costs of additional and substitute work in assessing both the cost and duration of projects. On the other hand, 95% of the respondents stated that they do see a need to take them into consideration. In turn, nearly 70% of experts provided an affirmative answer to the question about the need to consider different scenarios of restoration projects that would make it possible to select an optimal scenario (in regards to a project's cost and duration).

Summary and discussion

The paper contains a presentation of the results of a survey study focusing on the problems of the assessment of the cost and duration of restoration projects involving existing structures, particularly historical ones. In summary, we can observe that the most often used approach is assessing these parameters using an arbitrary estimation of duration and cost based on individual experience. When analysing the results of these assessments, we can observe that they are highly inaccurate. When performing an estimate in this manner, the respondents adopted a cautious approach resulting in a much shorter actual project duration or much smaller actual project costs than initially projected. A higher degree of accuracy was possible thanks to the use of more advanced methods of assessing duration (schedule) and cost (detailed cost assessment), however, they are used much more rarely. The respondents, despite generally not considering additional costs of performing additional and substitute work in their project duration and cost assessments, evidently see the need to do so. Nearly 70% of respondents associate this with considering different scenarios of carrying out projects. The analysis of differ-

ent scenarios is of significant importance in restoration projects, especially those that involve historical structures, due to limited knowledge about their technical condition and historical substance. As a result, a project can be carried out in different ways depending on the situation at hand.

Conclusion

Based on the survey study that was performed, we can conclude that assessing the duration and construction cost of restoration projects, particularly those involving historical structures, is not an easy matter and the accuracy of these assessments is low. This is mainly the result of the scope of construction work, which is difficult to predict in these types of projects due to limit knowledge of the structures that are being restored, particularly historical ones. The persons performing the assessments try to do their best in these uncertain conditions by widely applying an arbitrary method of assessment. It most often features a cautious approach employing a safeguard in the form of assuming an excessively long estimated project duration or high project cost. The study also indicates a need to consider additional costs of additional and substitute construction work in the assessments. These additional costs should be the result of an analysis of different scenarios of construction work, which can occur in a given restoration project. This study thus constitutes a justification and an introduction to discussing the subject of developing tools for the analysis of the completion time and cost of construction projects,

the character of the course of which will be undetermined.

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Summary

Problems of assessing the duration and cost of restoration projects on the example of Poland, Slovakia and Lithuania. The restoration of existing structures, especially historical ones, is a complicated endeavour. The often insufficient identification of the extant state of a building, the possibility of archaeological findings and the necessary procedures involving the securing and conservation of historical substance lead to difficulties in assessing the duration and cost of a planned project. The goal of the article is the presentation of the results of a study focusing on these assessments. Surveys were carried out among a group of developers, designers and contractors from Poland, Lithuania and Slovakia – all of whom had experience in the restoration of historical structures. The analysis of the results pointed to a low accuracy of the assessment of the cost of construction of these types of projects. The respondents expressed the need to take into account additional costs of the carrying out of these types of projects. The respondents highlighted the need to take into account additional costs of the performing of additional and substitute work as a result of considering different scenarios of the construction of restoration projects.

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