

The effectiveness of construction operation performance measurement techniques and the challenges of application in preventing delays in construction projects

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Abstract. Measurement of the productivity of construction operations is one of the construction project control efforts that helps describe the condition of activities at the operating level at that time. If the existing productivity is not in accordance with the plan, then improvement efforts are needed. Productivity measurement can be done by work sampling, 5 minutes rating, cycle chart, process chart, crew balance chart, and MPDM. However, based on the preliminary survey, the use of this method is quite low. This study aims to measure the effectiveness of the use of data collection techniques and analytical methods and identify the challenges of their application in the field. The method used in this study is a comparative analysis between output and implementation as well as interviews to several students who have been trained and apply productivity measurements on several occasions. The results of the effectiveness assessment show that the Chart and MPDM methods are effective in supporting efforts to prevent delays. The results of the identification of challenges show that data collection is easy to learn and apply in all methods, data analysis is easy to learn and apply in all methods except MPDM.

1 Introduction

Construction work delays are one of the main topics in the field of construction project management [1]. One of the efforts to reduce the risk of project delays is controlling work productivity [2]. Productivity in the construction industry is generally measured at the work tasks level of a construction operation [3]. The measurement method is generally carried out by reviewing the output by the work team within 1 working day. Work team productivity can be calculated by comparing production results with working time. But the problem is "can the conventional measurement method support efforts to prevent construction project delays?". Of course, the answer is no, because this method only provides information related to the performance of a job without being able to get information about delay problems and preventive solutions.

There are several measurement methods that can help prevent construction project delays by providing detailed information on the source of the problem and accurate alternative solutions. These methods, including: five minutes rating, work sampling, crew chart balance, cycle chart, process chart, and method productivity delay model (MPDM) [4], [5]. The use of each method of measuring field productivity has its advantages and disadvantages to improve productivity [6]. However, based on the preliminary survey, these methods are rarely applied in the field. The use of these methods for measuring work productivity from the experience of 125 field practitioners is quite low. the

question "have these measurement methods been applied in the field?". The results are presented in Figure 1.

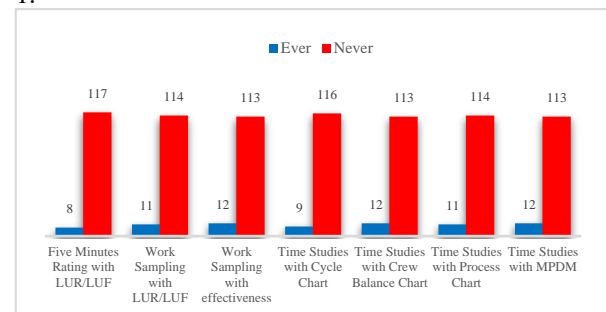


Fig. 1. The use of several methods for measuring work productivity from the experience of 125 field practitioners.

So, what is the problem with the contractor? why don't they use those methods? is it because they do not know? or difficult to learn and apply? The purpose of this research will explore basic information in the form of identification of the effectiveness of the measurement method to prevent delays and challenges in its implementation.

The method used is to assess the effectiveness and challenges of using the construction operation measurement method through the implementation of data collection and analysis of construction operations productivity in the field by students who have been trained. Assessment of effectiveness is based on the results of each measurement method that has been achieved by students and compared with the literature. Assessment of challenges based on student experience

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