

The Effect of Critical Activity on Critical Path and Project Duration in Precedence Diagram Method

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Abstract : The additional relationships i.e., start-to-start, finish-to-finish, and start-to-finish, between activity in Precedence Diagram Method (PDM) provides a more flexible schedule than traditional Critical Path Method (CPM). But, changing the duration of critical activities in the PDM network will have an anomalous effect on the critical path and the project completion date. In this study, we classified the critical activities in two groups i.e., 1. activity on single critical path and 2. activity on multi-critical paths, and six classes i.e., normal, reverse, neutral, perverse, decrease-reverse and increase-normal, based on their effects on project duration in PDM. Furthermore, we determined the maximum float of time by which the duration each type of critical activities can be changed without effecting the project duration. This study would help the project manager to clearly understand the behavior of each critical activity on critical path, and he/she would be able to change the project duration by shortening or lengthening activities based on project budget and project deadline.

Keywords : construction management, critical path method, project scheduling network, precedence diagram method

Conference Title : ICCTM 2018 : International Conference on Construction and Time Management

Conference Location : New York, United States

Conference Dates : August 27-28, 2018