Title: CPM Scheduling Driving Through Retained Logic

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Problem:

There are many times that people ask me to review their schedules and ask me to find what is pushing out a particular activity. They tell me that the activity's predecessor is complete and that the activity has started but is not yet finished but the completion date does not appear to be correct based on the remaining duration.

This paper will provide an insight as to why this is happening and will provide several proposed solutions to solve the problem stated above.

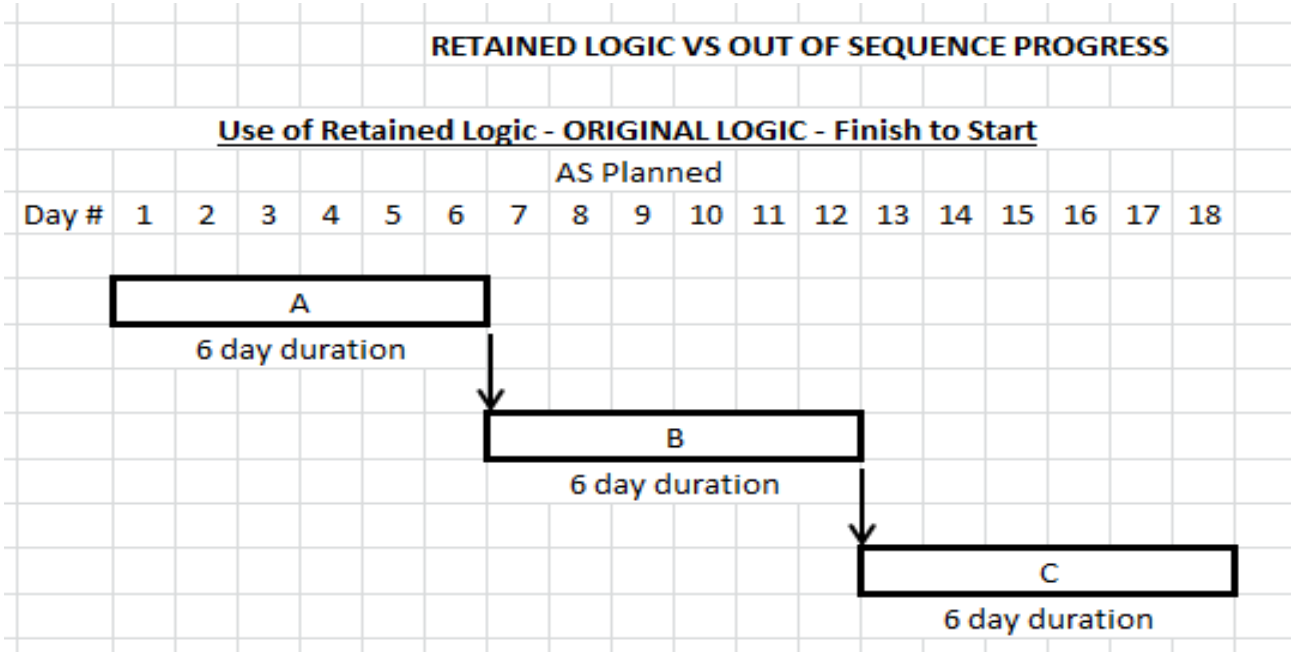
Depending on the scheduling software being used there can be different scheduling calculation techniques that can be used when scheduling progressed activities. This basically lets you choose how to handle the calculations for activities that have stared but are not yet complete.

There are 3 basic scheduling calculation techniques that can be used which are Retained Logic, Progress Override and Actual Dates. This paper will address the Retained Logic technique.

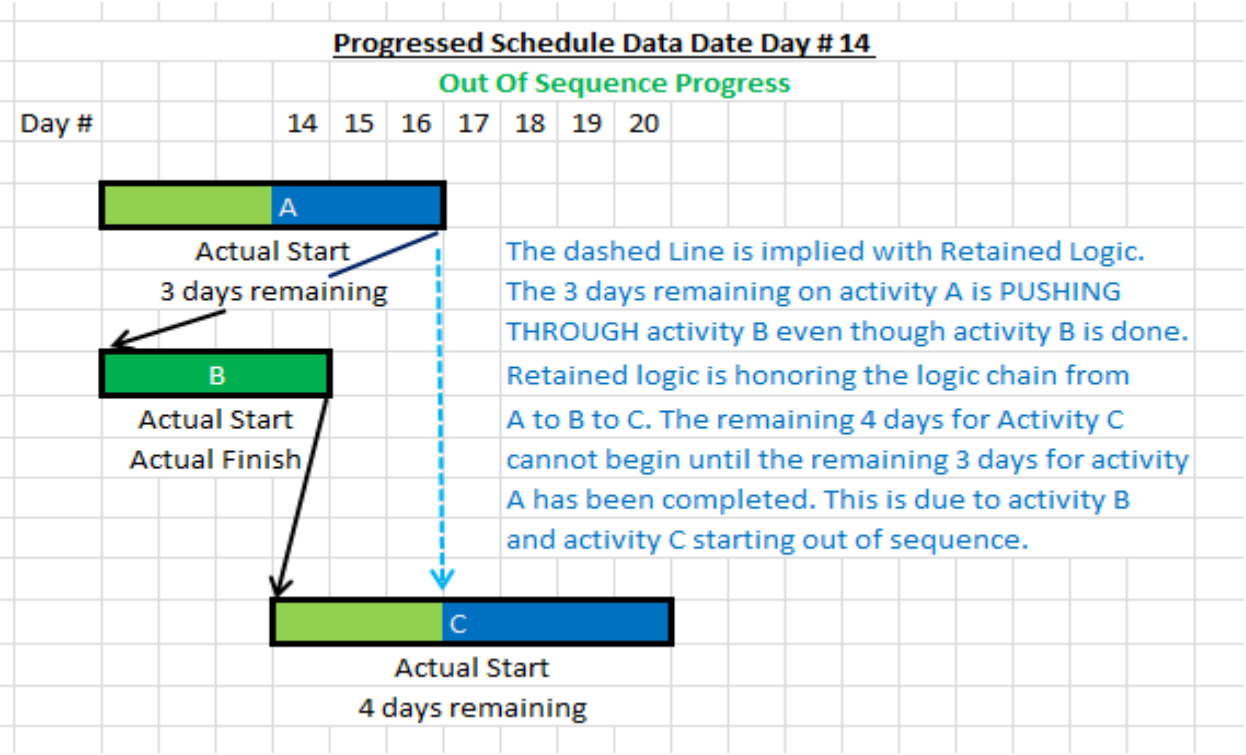
Definition:

Retained Logic is exactly as it sounds. When an activity that is in progress (meaning that the activity has started but is not yet complete) the start date for the **remaining duration** is not scheduled until ALL of its predecessors are complete. This means not only the direct predecessor to the activity but as well as ALL of it's predecessor's that are linked in that chain of activities. Retained logic honors the logic that is in the schedule. This is especially true when considering out of sequence progress.

Example of retained logic as planned (no progress)



Example of retained logic with out of sequence progress



Possible Solutions:

Sometimes it will be necessary to trace the logic chain back very far to find the activity that is not yet complete that is driving through to the activity in question.

There are several techniques to use to locate the diving activity when the driving activity it is not a direct predecessor.

A. Filter of the activity that is being driven out. Look at the activities direct predecessor and follow the predecessor chain until you get to an activity that is either in progress or has not started.

B. Filter for activities that are not complete. Then sort these activities by start date and look of the finish date that is 1 day prior to start date that for the activity that is being driven out. This may not work if the relationship is not a finish to start or if there is a lag on the relationship. This will make it more difficult to locate the driving predecessor.

C. Filter for activities that are not complete. Next add a column for **remaining early start**. This is the earliest start that this activity can start based on its predecessor's logic. You cannot look at the start date because it is out of sequence progress it already has an

actual start date. This is why it is necessary to look at the remaining early start date. This will give you a clue as to the finish date of the predecessor that you want to look for. The finish date of this predecessor will usually be 1 day prior than the remaining early start date of the activity that is being push out.

D. Examine the pure logic diagram to visually see the logic chain prior to the activity that is being driven and look for the activity that is either in progress or has not started in that chain.

E. Determine the float value for the activity that is being driven. Next filter for activities where the float value is the same. Look at the finish dates for these activities and look for the finish date that is 1 day prior to start date that for the activity that is being driven out. This may not work if the activities are on different calendars.

F. If the activity is on the critical path then file the driving activities for the critical path. If using Primavera P6 you can trace back the driving and critical activities to get the true critical path thru the project. To do this go to Enterprise then Activity Codes then select Modify then Add. Then type the new activity code called CP then click close. Next click Add make code values CP and the description my critical path then close. Now add this new column to the schedule. Look at the predecessor window right click on it and select Customize Predecessor Columns. Expand the General category on the left and bring the driving and critical columns over to the right. Next filter for the last activity in the schedule. Look at the predecessor window and look for the predecessor that has BOTH the driving AND critical boxes checked. Highlight that activity and in the lower right click on GOTO. Keep doing this tracing back the driving AND critical path until you get to the activity at the data date or the start of the schedule. Next click on the activity at the top and click in the NEW activity code that you made called CP and select the upside down triangle in the upper left where it says Display and select filter by All Values. Fill in the code in the first activity then right click and select fill down for the rest of the activities. Now you can filter for the activity code called CP. This is your true critical path and the activity that is driving through and pushing the activity in question is in that path.

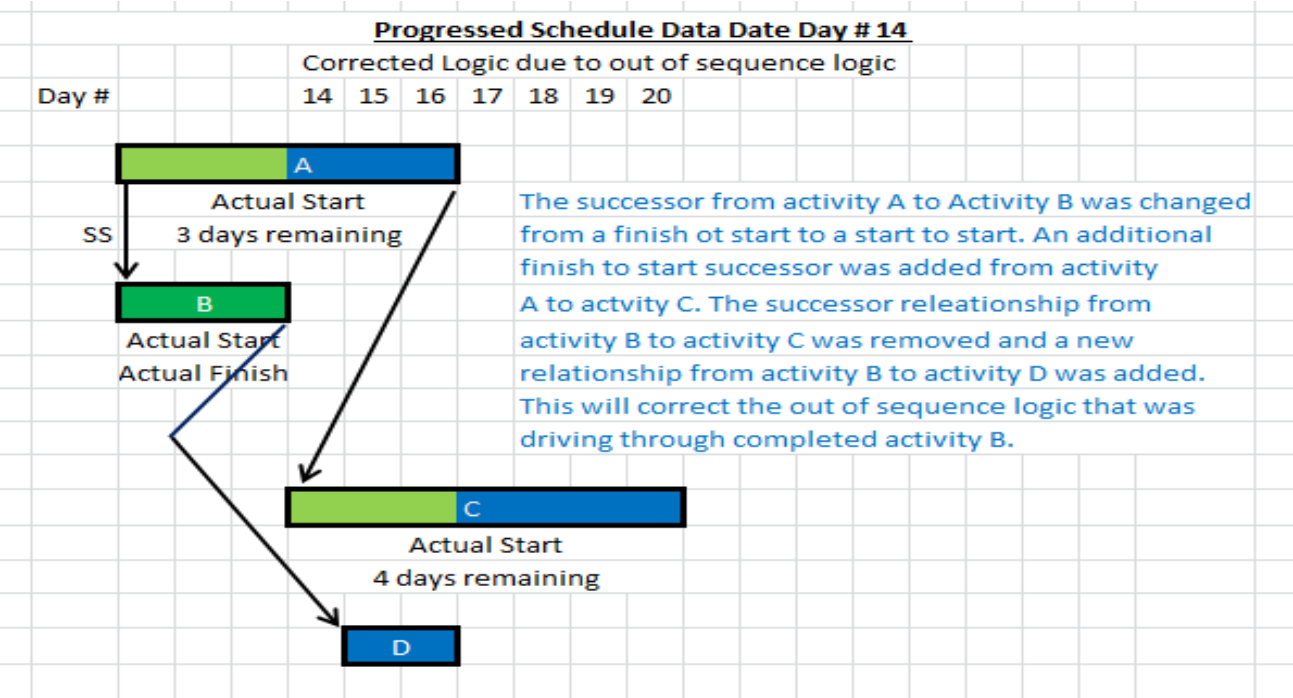
Actions:

Now that you found the activity that is pushing thru and driving your activity in question what do you do? What actions do you take and what are the possible solutions to correct the logic for the predecessor that is pushing through the completed activity to the activity that is in progress? What you want to do next is to revise the existing logic to account for the out of sequence progress.

There are several ways to revise the logic to account for out of sequence progress some of them have been listed below;

Revising Out of Sequence Logic:

A. Correct the logic to reflect the new work flow. It may be necessary to remove the original direct predecessor B and now link activity A to activity C see graphic below;



B. Depending on the type of relationship if there is out of sequence progress sometimes you can change a finish to start relationship to a finish to finish relationship with a lag and this will correct the logic.

C. On very few rare occasions it may be acceptable to leave the out of sequence progress as is to reflect what is happening in the field that maybe beyond your direct control. For example if you were directed to perform the work out of sequence then it may be necessary to leave the out of sequence progress as is to reflect that was not your original plan and this was not your choice but you were directed to work out of sequence.

Summary:

It is not always easy to find the activity that is driving through a completed activity that is pushing out your activity. By using some of the techniques listed above you will increase your chances of finding the culprit and will know for certain what is causing this activity to finish later than you think it should.