

Introducing the #timelapseganttt method, demonstrated by application to the Empire State Building Project and the construction of the Sydney Harbour Bridge

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1 - Abstract

Using novel methods, the paper describes how to transform a typical gantt chart into a dynamic diagram of the project plan (herein this method is called #timelapseganttt)¹, also featuring full access to specific detailed status data at any time instance (typically a selected day) throughout the project. The methods are applied to the Empire State Building project (c.1930-31) (ESB) and the construction of the Sydney Harbour Bridge (c.1924-31) (SHB), both chosen due to their general recognition, astounding achievements and publicly available planning information. It is shown that using these methods, even for megaprojects at these scales, a fully detailed project plan can be contained within a single small computer file and displayed on one page and, in it's simplest form, does not require the user to run any code. This will assist anyone using their imagination and the methods described herein to usefully, and extremely economically, plan projects of any type or size.

2 - Method

Requirements

1. MS Project
 - 1.1 VBA (optional)
2. Gantt Chart with usual Activities and their Start, Finish, Duration and Predecessors at a minimum.
3. A preliminary idea of how to represent the project as a "drawing" or an "object" that will be automatically drawn by the software using customised bars in the barchart view (see below section). In the case of the ESB example (see fig. 1 (R) above), it is a front elevation with the left side indicating the external view, whilst the right-side is more like a cut-out showing the interior works. For the SHB (see fig. 2 (mid and bottom) above), the "object" is a longitudinal section through the bridge with a background of Sydney (albeit much simplified) along the approaches and site of the SHB. Please note the intention is to only be indicative of the activities given the constraints of the software. The object is by no means intended to represent an

¹ #timelapseganttt: this exists as a diagrammatic view in the project planning software, and is dynamically manipulated by changing the status date of the project file. Furthermore, screen captures can be extracted and saved then displayed as animated .GIF or video files.

actual design drawing of the project being planned. What may be lacking in design accuracy is more than justified by this method's versatility, economy and complete integration into a project's implementation plan, also presenting the project team with the opportunity to maintain tight management and control. Hence, the project management cycle traditionally described as "planning, organising and controlling" can be implemented using this method with a bare minimum of overhead.

For the ESB, the author prepared custom bar shapes (see fig. 3) for each of:

- Existing building to be demolished
- Excavation
- Footings
- Structural Steel framework
- Concrete floors
- Exterior cladding
- Window glazing
- Exterior brickwall
- Interior brickwall
- Elevator rough-in
- Elevator finishing
- Plumbing rough-in
- Plumbing fixtures
- Interior tiling
- Interior painting & decorating
- Electrical fixtures
- Works in progress
- Status Date

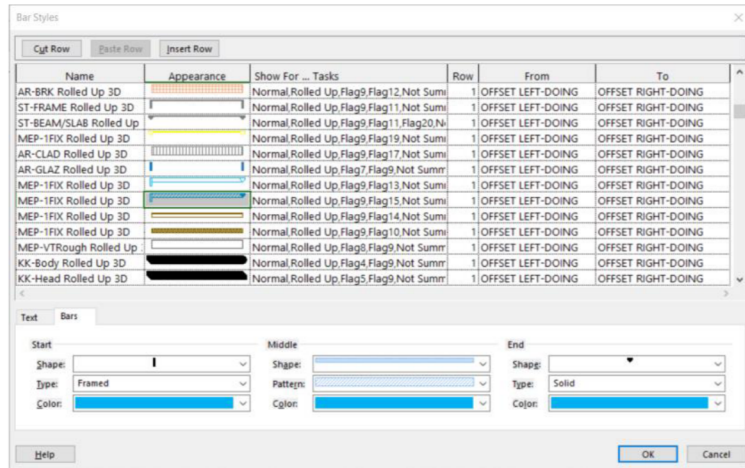


Fig. 3 Bar Styles wizard as part of MS Project

NB. The limit is about 20 customised bar shapes, however creative application of the method can extend this limit.

Data Input

Customisations

Fields

- Two custom dates to represent the left-side and right-side of the object, ensuring these dates lie outside the project start and finish dates (to avoid confusion). Consider this as the horizontal axis of your 2-dimensional diagram.
- A custom lookup table of every building Storey, or an otherwise appropriate vertical scale. Consider this as the vertical axis of your 2-dimensional diagram.

Groups

- Group the activities by Storey, typically sorted top-down, and also (but not essentially) rolled-up to the Storey level.

Filters

- Show only activities relevant to the Storeys grouping.

Views

- Define a view with Group:=Storeys
- Scroll and adjust barchart to display the dates representing the Left and Right sides of the object as above
- Change status date (either manually or with the userform as per below) to see the object's status change.

Flags

- The different bar styles each need a flag associated with them (hence the general limit of 20).
- Minimum one flag should be reserved to mark which tasks are planned to be done, or in progress, in relation to the status date.

Bar Styles

- Corresponding to each custom flag, select colour and shape the planner deems is an appropriate representation of the project activity.
- Replace the normal Start and Finish dates with the custom Dates as described in the Fields section above.

Code (Optional)

Modules

- Procedures are coded to calculate custom fields according to status date.

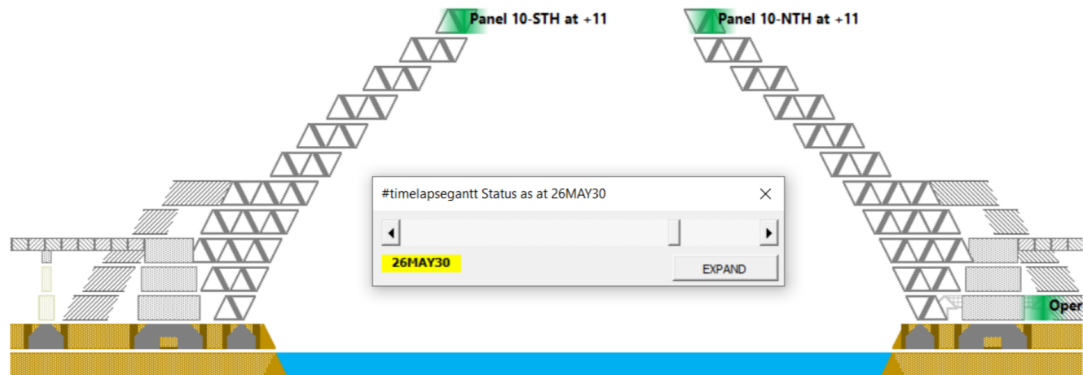
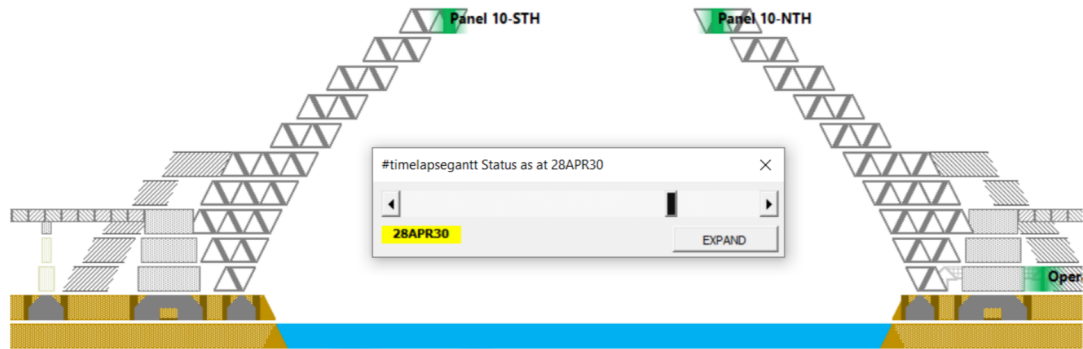
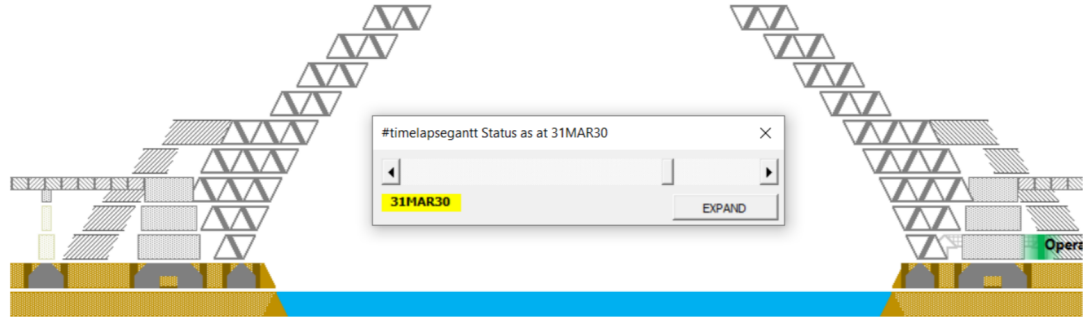
Userform

- Call up the userform, which allows a scrollbar interface with the Project Status Date, and an expand / retract button to show / hide further details, as per the user's code:
- when the Status Date changes, custom fields are recalculated from the above module to give up-to-date status for whichever details you wish to include in the userform at whichever status date you select, as well as updating the object's status in the barchart.

Output

Timelapse Gantt View

- Status can be changed programmatically as per userform above. Alternatively, the userform can be closed and the Status Date changed manually. The object's status will change accordingly.
- [ESB](#) link to timelapsegantt view converted into .mp4 video file
- [SHB](#) link to timelapsegantt view (preview version) converted into .gif animation file
- SHB: three example timelapsegantt views of the object, each 28 days apart:



3 - Conclusion

The method described above is quite straightforward and it easily transforms your Gantt chart into an understandable, visually-appealing, one-page status update for any instant of time in your project. It has all the same rigour and detail that as the planner you have input to your original Gantt chart, in fact it is just a different view of the same Gantt chart, conveniently contained within the same file and able to be viewed side-by-side with, say, a more traditional line-of-balance view. As has been demonstrated here, it works for state-of-the-art megaprojects but can also be applied to any other type of project planning, from space travel to vegetable gardening. I hope that it will be put to use on your next project too.

4 - Acronyms

- #timelapseganttt - name coined for this novel method of preparing a Gantt chart in the format of a dynamic diagram
- #mspart - alternative name, and broader description, for this novel method of preparing a Gantt chart in the format of a dynamic diagram
- [ESB](#) - Empire State Building
- [SHB](#) - Sydney Harbour Bridge
- MSP - Microsoft Project
- VBA - Visual Basic for Applications

5 - Bibliography

1. ESB Fig. 1 (L) image accessed on 15OCT2021 from:
<https://stevenrhamilton.wordpress.com/2014/11/21/how-does-your-project-plan-compare/>
2. SHB Fig. 2 (top) excerpt from "(Paper No. 4922) "Sydney Harbour Bridge: Manufacture of the Structural Steelwork and Erection of the Bridge." by Ralph Freeman and Lawrence Ennis (p. 253), *Minutes of the Proceedings of the Institution of Civil Engineers*
3. <https://www.timecostcurves.com> *the author's website pertaining to this, and other, project planning topics*

6 - Acknowledgements

1. Mike Somers, civil engineering lecturer at RMIT (c. 1990's) - esp. for the lecture handout on the Time-Cost Problem
2. Digby Grant, founder of DGA (c. 1990's-2000's) - esp. for convincingly advancing the view that "with a plan, you can do anything".

7 - Brief author profile

The author's background includes a civil engineering degree and an international career in project planning and management for many commercial construction projects, mainly hotels in SE Asia, as well as infrastructure projects such as the Burnley tunnel. He is now applying what he has learnt along the way to developing software solutions to difficult project planning problems at timecostcurves.com