



Talk on Construction Visualisation in Project 4D Planning & Scheduling

by Prema Sivanathan

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The talk was delivered by Project Management Technical Division on 18th February 2017. This report provides details of the talk which including project management tools such as Oracle Primavera P6, Microsoft Project and Synchro 4D Planning Software. This talk was attended by 51 personnel comprising of IEM members. In construction, 4D is any model that combines space and time into a single interwoven project visualisation. Historically, space and time information of the construction industry has been disconnected. Design, defining spaces; and the project schedule, defining time, have always been created or as some would like to say "authored" separately, held in separate data silos, and only ever combined by the imagination of the people involved. In more recent history, there have been attempts by many of the engineering computer aided design (CAD) software systems to combine the spatial data from 3D design models with a time "attribute" from the project schedule to trigger computer graphics rendering to create a 4D visualization. To consider time a fixed attribute in 4D may be convenient for computer graphics rendering, and may look interesting; however time is, and always will be, dynamic in construction operations.



PCSS Senior Consultant, Mr. Phil Palmer (left) presented Construction Visualisation in Project 4D Planning and Scheduling.

Planning and Scheduling in Project Management

Project success is usually measured by finishing the project on time, within budget and meet some quality specification. However, there are many factors that contribute to project failure in these days, and one of the factors is caused by a lack of collaboration and standardization in reporting performance. Getting accurate information for performance reports is very crucial these days because the project team are separated by departments, the environment and processes & technologies. Hence, to achieve this, PMI has outlined the process group of project management where one of the process groups is the Planning Process Group. Planning is performed in project management to establish the total scope of the effort, define and refine the objectives and develop course of action required to attain those objectives while the scheduling phase deals with the process of calculating when the work is to be executed and includes Critical Path Methodology (CPM), Resource Leveling and Baselining. Lack of planning or scheduling in Project Management will affect the implementation of projects. Apart from that, planning is very important in order to control time and budget for your project as the project team needs to monitor and control its implementation during an execution phase.

In 2015, BCA Singapore mandated electronic submissions in BIM format for architectural, structural and M&E plans of building works for regulatory approval. Synchro includes in the 4D planning process items such as safety and infrastructure item providing efficient and high quality construction visualisation. Synchro software gives an impact to construction industry specifically on improving construction project performance with the help of computer technology in the construction methodology rehearsal which can be viewed and discussed continuously before and throughout the project lifecycle. It integrates with Oracle Primavera P6 and other scheduling software to link resources such as human, material, equipment and space to the associated schedule tasks, making changes and comparing baselines to alternatives is quick and easy. Communication is more clearer as we can see each step in every process, hence, this would produce efficient, reliable and safe project delivery process that saves time and money. This software is useful to contractors, subcontractors, specialty suppliers, consultants and owners for the construction of buildings, infrastructure, roads and bridges, ship building etc.

Why 4D?

It is possible to view the end product with 2D drawings but this is left to the imagination of the Project Team. This would not be a major problem to designers of the proposed project, however, this can be complicated as other stakeholders could have a different visualization for the end-product. However, the same erection sequence is extremely difficult to visualize across the project team just by viewing the construction work programme thus, clashes with structures or systems during the

construction phase will not be evident by the Planners. When this happens, time delays become evident and redesigns may incur additional cost. Synchro 4D Planning is designed to adopt standard project management methodologies and to ensure the work program is legitimate in terms of scope of work, logical links, critical path and resource leveled.