



PROJECT PLANNING AND MONITORING

Project planning and monitoring by Rambøll is adopting a "Best Practice" approach supported by modern and efficient tools.

Project planning and monitoring is a key discipline when managing projects. At Rambøll, we keep a long track record of performing project planning and monitoring of especially large capital projects within the business of civil works and construction.

On the basis of our wide-ranging experience and in our efforts to contribute to constantly developing the field, we have developed a "Best Practice" approach for planning and monitoring.

Project planning by WBS and ATR

When planning a project a main focus point is to establish well-defined structures, which have to reflect the work to be done in the light of transparency. An approach called Work Breakdown Structure (WBS) has been adopted as an international standard, which is in compliance with the good practices within the field of planning. The WBS helps to establish a proper

structure of the project. As a key feature, the bundling of activities in work packages ensures a smooth flow in the work processes when carrying out projects.

The work packages contain activities, which can be considered "bricks" compared to the planning work. Activities have to be scheduled according to time. They form the basic element of all planning work including assignment of resources and steps for implementing Earned Value Management (EVM).

The activities and the derived deliverables and resources to carry out the scope of activities are scheduled by adopting an ATR approach. An ATR (Activities, Time, and Resources) is the basic element of planning, on which the conditions of the planning work, such as start and finish dates, milestone dates, dates of deliverables, and the allocation of resources as man-power, materials and expenses etc., are defined.

When issuing the Project Initial Document (PID), the ATR becomes a basic tool in developing the Stage Plan in accordance to guidelines of the project model Prince2. In this perspective, the ATR is the element that forms the overall budget after initial agreement and approval by the customer.

Progress reporting

Controlling the momentum of the project is managed by progress reports. They serve to inform, through root cause analyses, about the state of the project with regard to deviation compared to schedules and budgets. Another key feature is

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PROJECTS PROVIDED WITH PROJECT CONTROL SERVICES

- | | |
|---|--|
| • Fehmarn Belt Tunnel Design | www.femernbelt.dk |
| • Fehmarn Belt, Rail Net Denmark, Conceptualization and Programme | www.bane.dk |
| • Signalling Programme, Design and Execution | www.bane.dk |
| • Køge Bugt High Way, Detail Design | www.vd.dk |
| • Nordhavnsvej, Detail Design | www.nordhavnsvej.dk |
| • Forth Replacement Crossing, Detail Design and Construction | www.transportscotland.gov.uk/road/projects |
| • The New University Hospital, Phase 1 Masterplan | www.dnu.dk |

their definition of any corrective and remedial actions for bringing the project back on track.

Cost controlling and forecasting

Well prepared budgets and continuous preparation of forecasts based on past experience combined with future estimates are essential in cost controlling. A prerequisite for this is cash flows based on and updated through time schedules.

Together with committed costs within the budget limit, and by adding expected extra costs, forecasts can be made that conclusively inform about the costs estimated to complete the project.

Time scheduling and milestone analysis

Well prepared time schedules are essential for any project. Time schedules form a frame of reference for executing the project and for monitoring the performance with regard to start and completion dates of

activities. The schedules are prepared with reference to the set milestones and are explored by a top-down approach. The follow-up on time schedules is made by a bottom-up approach - opposite to the planning exercise.

The outcome of the time schedule follow-up is forecasted dates of activities (start and completion dates) and ultimately, an analysis of possible deviations on the milestones.

Performance measurement and Earned Value

In monitoring a project's performance, it is crucial to ensure that the targets with respect to the parameters of time and cost are fulfilled. By introducing a third parameter, Earned Value, the measurement can be carried out in a more balanced way. EVM is a project management technique for measuring project performance and progress in an objective manner.

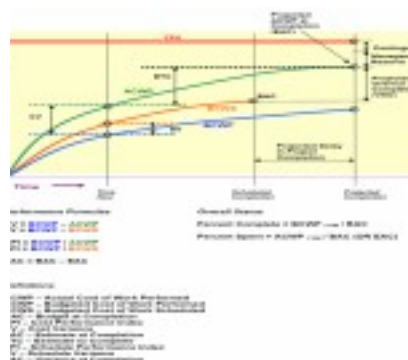
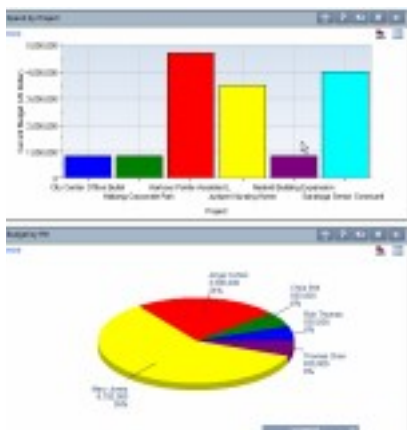
EVM has the ability to combine measurements of scope, schedule and costs into a single integrated system providing key performance indicators to inform about the stage of the project. EVM is notable for its ability to provide accurate forecasts of project performance problems. It also provides more sophisticated analyses of recorded deviations.

Methodologies and Tools

Applied methodologies are based on Project Management Body of Knowledge (PMBOK) and Prince2.

Tools for planning and cost estimation are:

- Primavera Web Board
- Primavera P6 Professional
- TILOS
- Sigma Estimates



LEFT

Primavera Web Dashboard as a tool to support decision making of the management

RIGHT

EVM, Key Performance Indicators (KPI), an approach for measuring the performance