A Fast, Easy Approach to Risk Management

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- ***Introduction of science metrics to planning and scheduling***
- ***A modeling approach to ensuring best practices in project planning***
- ***Managing risk by optimizing planning***
- ***Making large, complex plans manageable***

Leif Hoglund has Bachelor and Master degrees in Engineering, with particular emphasis on measurement techniques applied to acoustical problems. He worked as a researcher at NASA, where he developed a correlation technique for the measurement of noise sources in turbulent jets. He also co-founded and served as General Manager for Thor Telecommunications Technology from 1984 to 1989, as Director of Product Management at Raynet from 1990- 1995. In 1995 he co-founded E/O Networks, a company that developed advanced fiber optic access equipment for communications providers. He has been an industry analyst and consultant for the past 7 years, concentrating on software issues for large service providers. He is currently a co-founder of Ibico, where he serves as VP Marketing and Business Development. He can be contacted at leif@ibico-cor.com , or at 650 773 4459.

For Large Projects, Structural Risk Dominates

As Microsoft Project evolves to manage ever larger more complex plans, it becomes harder for a program manager to get an understanding of what might be called the "structure" of a project. Experienced managers know that some plans are structurally more risky than other plans. For example, long chains of dependent tasks are "riskier" than shorter chains; long duration tasks that are scheduled for completion close to the milestone date are also "riskier", as are tasks that depend on shared resources. These structural elements cause a plan to be difficult to keep on track because relatively small slips can cause milestones to be missed. These "brittle" plans are the result of poor planning, since these risks are totally within the control of the project planner. In fact, for very large plans, structural deficiencies will dominate since it is not individual tasks that lead to failure, but overall poor project structure, where dependencies dominate.

PERT/Monte Carlo Often Not Practical

Unfortunately, there isn't a simple pull down menu on Microsoft labeled "calculate structural risk", so the conventional approach to gaining an early understanding of how a project schedule might behave is to apply something like PERT to the schedule, followed by a Monte Carlo simulation to develop a distribution function for meeting the intended milestone. In this approach, a basic required input for each task is the expected duration, a minimum duration and a maximum duration. For large projects, this is an unrealistic burden, but even more important - and seldom discussed - is the fact that the method is mathematically unsuitable when applied to one-off tasks where there is no knowledge of the expected distribution.

Wave Modeling of Tasks

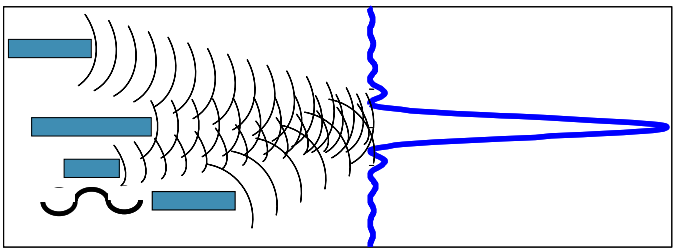

Figure 1: Human tasks modeled as waves

A new method, based on quantum probability, is introduced to define the quality of project plans in terms of probable success. Tasks and their duration are constructed as though made up of packet waves, where all partial waves are expected to be coherent at milestone dates. As shown in Figure 1, each task contributes to meeting a given milestone in a way that is directly related to its coherence. When planned tasks slip from their expected duration, they are said to be perturbed, and their contribution to milestones will change, thereby affecting the probability function of the planned milestone. The process of evaluating milestone probability as a result of task perturbations is at the core of the approach.

Simpler, Faster Estimates of Risk

Using quantum probability, *all* scheduled tasks are assumed to be uncertain, and all tasks are modeled to "interfere" with one another in the same way that physical wave structures might interfere with one another. What is exciting about this radically different approach is that it *does not* require additional duration estimates to be made, but still calculates a milestone probability distribution. In fact, there is good reason to believe the analysis is *actually more accurate*. It is well known, for example, that for large or complex projects, there are always a substantial number of task dependencies. These overlapping highly interdependent tasks cause projects to generate huge—and largely unanticipated—volumes of coordination overhead that is entirely hidden from a project Gantt chart. It is not planned or even acknowledged, yet these interdependencies are a key cause of project coordination difficulties and schedule slips. Traditional project management approaches and tools focus only on direct work, which tend to reinforce overly optimistic estimates.

Using the fact that these quantum probability estimates are fast and easy to generate for any project, Project executives have an enhanced ability to predict project results, and have better control over project approval decisions based on quantifiable, predictive data. The method has been shown to return useful results for any project for 50+ tasks, but the larger the project, the more powerful and useful it will be.

Ibico (www.ibico-cor.com) has proprietary predictive software based on quantum probabilities, and offers desktop software where any project plan built using MS Project can be automatically analyzed.