

# «I want to know the (financial) risks of calculating the proposal!»

«Tell me how your project starts and I'll tell you how it ends.»

**Project planning** is the main task of project management. Project planning should, as much as possible, make preparations for actually realising the project.

Project planning begins with the structure. By building upon a set of requirements or certain specifications, the planned developments are functionally and commercially structured. The structures which are prepared in this phase (the product structure, project structure and cost structure) lay the ground work for all other steps in the planning process.

The planned project structure gives rise to the range of tasks, the **costs of which must be estimated**. Outside of the actual/external potential to gain experience, the possible outcomes of cost estimation procedures should be considered.

When calculating costs, you must estimate how many people and how much time is required for each work step, what



resources (materials, assemblies, machines, etc.) are to be used and what it all ultimately costs. Costs, deadlines and necessary resources are then used as a basis for the proposal.

Cost calculations for projects, particularly those which contain or are marked by a particularly high level of innovation or are classed as «unique», are naturally always **very hazy**. This uncertainty is driven by two key aspects: (1) the uncertainty of the cost of individual work packages, and (2) the likelihood that individual risks might occur.

If dealing with stiff competition, when it comes to how far the price needs to be adjusted to meet the demands of the client, this can lead to a dangerous negotiating platform which is full of risks.

At this point, the company's directors have to step in and do their utmost, to analytically set the amount of leeway that can be afforded to the negotiating process. They cannot rely on gut feeling alone. This is true then, particularly, in cases where the

client is demanding a fixed price and is unwilling to finance his own mistakes or additional services with supplementary payments.

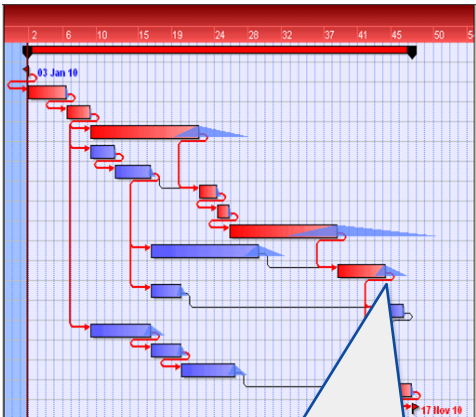
To consider haziness and individual risks, the methods must be developed taking into account the theory of probability. When predicted values are indicated by a spread of data, it is no longer as simple as adding up all the figures; The ranges are created by using what is known as distribution density (e.g. a three point estimation model with beta distribution).

The possible scenarios are summarized in simulations (the Monte Carlo Method). The result is an overall distribution function, with which firm assumptions are made about the total cost and risk potential as well as their likelihoods.

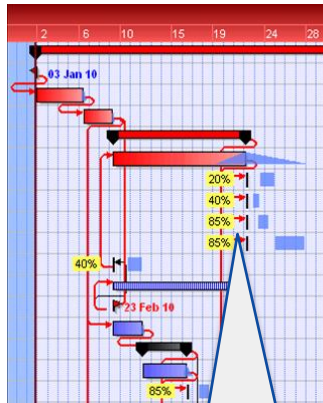
By using methods of calculating probability, it is possible to map what is really known about costs and risks right from the start by using a spread of data. This means that reality can be better modelled than it could be if we simply used one deterministic value.

In this way, the tenderer can see which costs will not be exceeded in the event of the relevant probability. Consequently, the tenderer can structure the project plan to accommodate the costs and risk of their own willingness to take risks and the negotiation process can proceed calmly and securely.

# «This is how we fix the problem.»



Uncertainties with the estimation of effort. It might concern time, material, cost of machinery etc.

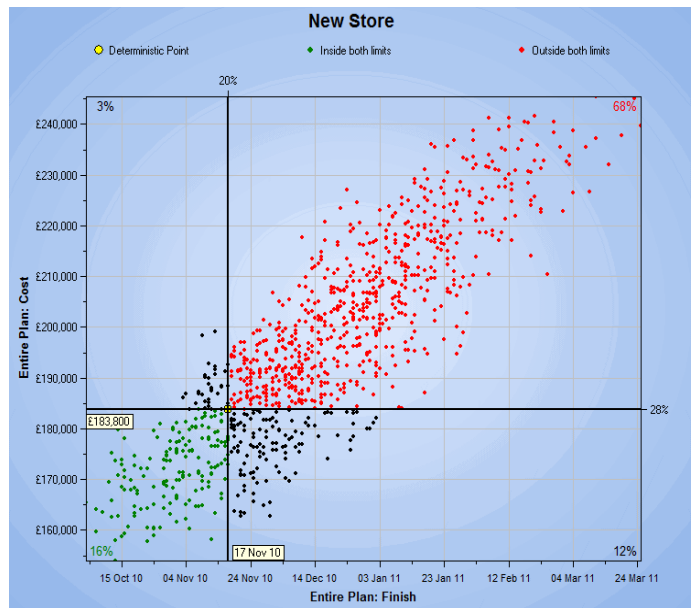
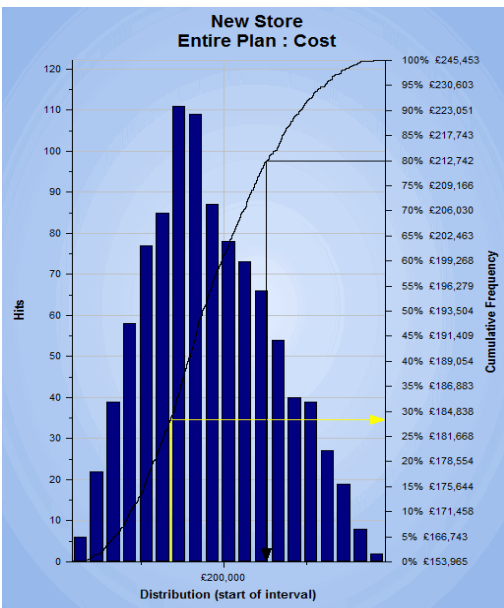


Single risks with probabilities

Both diagrams show the task structure plan (GANTT) with defined uncertainties.

These results are used as input variables for the simulation. Warning: If the project begins to follow the critical path, it can suffer heavy set backs.

The diagrams below show the results of the simulation given the costs and deadlines.



If an exact figure is returned during cost calculation, it would seem to be erroneous, given these aspects. Deterministic predictions based on individual values are, in practice, quite common, although it will be clear to all those involved, that the project plans are never costed to exact thousand euros (in the above example the chance is around 28%). The actual value lies either below or, as practice shows time and time again, above that figure. In bigger projects, these surplus costs and the financing costs that come with them can quickly mount up.