

## How to Get out of the Project Tar Pit

Let me quote Fred Brooks from his book "The Mythical Man Month", published in 1974. "No scene from pre-history is quite so vivid as that of the mortal struggles of great beasts in the "tar pit". Large system-programming has over the past decade been such a tar pit and many great and powerful beasts have thrashed violently in it". Today, the experience is not different. Project teams can find their "product wagon" mired in the project "tar pit". The question is: ***How can we turn the wagon around and have the team charge towards the destination?***



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Working as consultant managing client's projects, I often find myself thrown into the "tar pit". The following three questions help me to stop thrashing and move the project out of the "tar pit":

1. **What does the "tar pit" look like?**
2. **How do I go about getting out of the "tar pit"?**
3. **What does the first milestone look like?**

Let me say a little more about these questions and how they relate to the challenges of a software development project in the "tar pit".

When a project finds itself stuck in the "tar pit", it is a good idea to take a fresh look at the project, the team and the product. Usually someone who has not been part of the project is in a much better position for assessing the situation objectively. A person outside the project is free to explore all sources of information in an unbiased manner. Here are some of the possible sources for scoping out the "tar pit":

- ◇ Existing project plan
- ◇ Existing product specifications
- ◇ Status from each team member
- ◇ Expectations and objectives of the person(s) sponsoring the project (customer and company)
- ◇ Impressions and assessment from people outside the project (consultants, employees familiar with the project)

Gather as much information as you possibly can. These subjective impressions and objective facts define the landmarks in the "tar pit". These landmarks are important for route selection and orientation.

As much as the fact-finding provides a good project overview it also raises more questions. More information is needed to answer these questions. A proven way to gain information is by taking action. Action provides feedback that helps validate the facts and impressions.

Looking at the facts and impressions it is probably difficult to point to one issue that, once resolved, will get the project back on track. More likely, it is a combination of many factors. Talking

with people on the project and outside of the project, some or all of the following issues may be brought to your attention

- ✧ Requirements are not documented
- ✧ Defects in vendor software delay the project progress
- ✧ Deadlines are not met
- ✧ Lack of resources for testing the software

Before you can answer the question "How do we get out of the tar pit?" people involved in the project need to define a destination that is supported by everyone. Reviewing the specific objectives for a particular project usually results in two general objectives:

- 1. Deliver the software product to the market place (customer)**
- 2. Improve the predictability of developing the software system**

Project planning and oversight help achieve both objectives and provide guidance for deciding on the path out of the "tar pit". Project management serves as an umbrella for all the issues that may ail a project. During project planning and execution all areas are touched, such as requirement definitions, schedule, teamwork and the technology included in the product and used for development. Project planning and execution create action and action provides further information about what is needed to get the project back on track. In other words, planning and execution of a project serve as a forcing function.

So far we have discussed ways to learn what the "tar pit" looks like. I recommend project planning and execution as a guidance system for getting out of the "tar pit". The third question asks us to define the first milestone we want to aim for. Here are the characteristics for identifying the first milestone

- ✧ **The first milestone needs to be a day's march away. We are looking for an early success that provides the project team with confidence.**
- ✧ **The first milestone is a place everyone can agree on and knows what it looks like.**
- ✧ **The first milestone is an important stepping stone in the overall approach for getting out of the "tar pit".**

Finally, after reaching the first milestone, it is time to review the facts and impressions gathered in response to question one above. It is also an opportunity to assess what worked and where improvements are needed in order to avoid future tar pits.



If a team is new to project management, then task estimation is probably an area that requires improvement. There are many reasons why the task estimates may not be adequate.

For example, when asked for estimates, some people will provide duration estimates that include time such as, meetings, chats at the water fountain and interviewing candidates. Others may provide effort estimates for how long it takes to complete the work without interruptions. ***As the schedule only consists of tasks related to the project, it is better to provide duration estimates rather than effort estimates.***

Using duration estimates begs the question What is the percentage of overhead? The overhead is influenced by many factors:

- ✧ How thin is the knowledge spread? Small project teams usually have only one expert for each area, such as middleware, database management, configuration management and build process. All members will call upon this expert, which means many interruptions for the expert. *Cross training may be an answer here*
- ✧ Does the project have regular team meetings or are meetings called spontaneously? Too many ad-hoc meetings cause many interruptions and take time away from focused work on the project tasks. *Regularly scheduled project meetings, once or twice a week are the answer.*
- ✧ Are the engineers called upon to help out in other areas, such as interviewing candidates for new positions or preparations for trade exhibits? *If this is known ahead of time, these activities can be factored into the duration estimates. If the project is under way, this can be corrected through overtime and/or scope reduction.*

Task estimates may be off by 100%, if people are not accustomed to estimating the tasks they are responsible for. It is important that project schedules are prepared with task estimates from the people who do the work. This means that every engineer needs to be a competent estimator. Providing estimates can be learned by recording actual task durations for a particular time period and comparing them against the original estimates. If there is a discrepancy between estimates and actuals, possible reasons need to be identified.

Another area that may need improvement is how people work together in a team. This is especially true, because being in the "tar

pit" together may have strained relationships. Team members may have lost trust in each other. People may have developed assumptions about each other and the customer. The problems and challenges and associated stress may have caused a communication breakdown. A team member may have resorted to yelling in order to be heard. Team members may have fallen into the habit of passing on the buck rather than taking ownership. Software systems can not be built by the effort of one individual. It requires a team of experts to work together closely. **Teamwork means accepting the inconvenience of mutual dependency.** It requires mutual commitment from all team members. It is important that team members are willing to help each other out. Once people amplify each others strengths, the whole is more than the sum of the parts.

**Therefore it is important to create an environment where people can rely on mutual commitments and help from each other.** Such an environment is reinforced through regular follow-up on individual and project commitments; this is done through project meetings and one on one. It is important to reward team members for helping each other. People value receiving appreciation directly from peers through peer awards that acknowledge individual contributions.

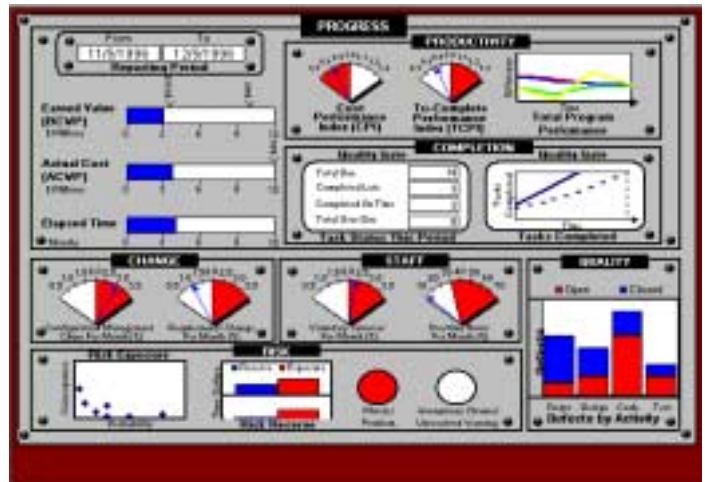
Even in the year 2000 there will be project tar pits. I suggest using project management to pull a project out of the "tar pit". Based on the facts and impressions gathered while scoping out the "tar pit" and the objectives for the first milestone) a project schedule can be formulated. By executing the project schedule the team has to overcome the challenges jointly, thus gaining trust and confidence into each other and the project.

## Project Metrics through the Project Control Panel

In preparation for a company wide training program in software project management I had the opportunity to interview senior management at the company. I asked them to share with me their expectations from the training program. One manager described to me his vision, which consisted of a cockpit with dials, and gauges that would provide him with a quick overview of the status for a project. The desire to manage software projects by the numbers is still a vision of the future.

The **Project Control Panel** is a tool that automates the collection and graphing of software project metrics. The Project Control Panel was developed by the SPMN (Software Project Managers Network) with the above vision in mind. It maintains five major categories and two subcategories of project data: Progress,

Productivity, Completion, Change, Staff, Risk, and Quality. These categories were chosen to cover the primary areas that every project manager should track on large-scale software development projects. The gauges and indicators on the Control Panel are in the form of bar charts, dial gauges, line graphs, scatter plots and warning lights.



Standard Control Panel

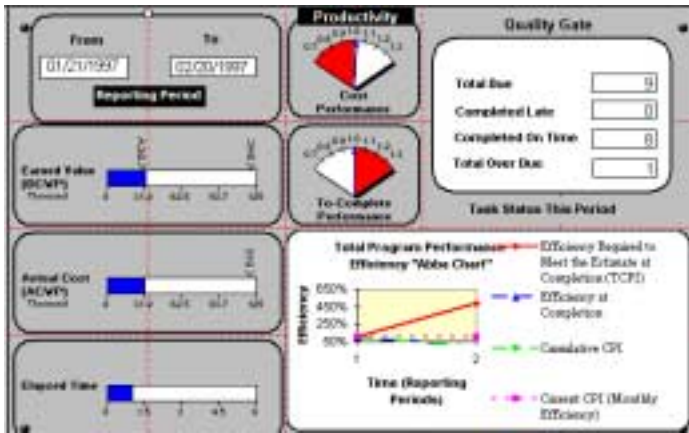
Recently companies have focused their attention on establishing a software project metrics program. Motorola was one of the early adopters by making the collection of project metrics a standard part of its project practices. Motorola selected five metrics and provided guidance for interpreting each metric individually and in relationship with one another. In addition, the description stated that many project parameters influence the specific values for each metric and therefore each project needs to be assessed on its own merits.

Motorola's introduction and description of metrics points out that guidance and experience are needed in order to analyze and control a project by the numbers.

But, not only the interpretation and analysis of metrics takes time, the data collection is time consuming in the first place. Therefore, I recommend to start with a small set of metrics. Select metrics that are collected automatically and gain experience understanding and interpreting their values during the life cycle of a project.

Using the functions of the Project Control Panel I created a custom panel with metrics that can be imported from Microsoft Project.

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Custom Control Panel

The control panel contains the following metrics:

❖ **Earned value**

Comparison of BCWP with BCWS and BAC.

If BCWP is less than BCWS the project is behind schedule.

Comparison of ACWP and EAC

If ACWP is greater than BCWP than the project is over budget.

❖ **CPI**

The cost performance index (CPI) gauge shows how efficiently the project team has turned costs into progress to date. CPI represents how much work was performed for each dollar spent, or "bang for the buck."

❖ **TCPI**

The To-Complete Performance Index (TCPI) gauge shows the future projection of the average productivity needed to complete the project within an estimated budget. Always question claims of future productivity improvements that result in a 20 percent or greater increase in TCPI over CPI.

- ❖ **Elapsed time**
- ❖ **Task completion during reporting period**
- ❖ **Total program performance**

Only the task completion data is entered manually. All other data can be imported from a Microsoft Project file.

The Project Control Panel is implemented using Microsoft Excel. It consists of the "cockpit" panel display, two work sheets for data entry and an additional graph for each metric on the control panel. For example, a line graph is provided for a closer look at the trend of the "task completion" metric.

The tool also provides features for creating custom control panels. The Excel spreadsheet, a users guide and a technical guide can be downloaded free of charge from the Software Project Managers Network web site (<http://www.spmn.com>, click on the Control Panel under SPMN Quick Links). Limited technical support is available.

## P2E Calendar of Activities

- ❖ **Monday July 26<sup>th</sup> and Tuesday July 27<sup>th</sup> 1999**— Introduction to Microsoft Project98, 2 days, Registration: (303) 492-8668, Location: CU Computing Center, Cost: \$165.00
- ❖ **Monday August 9<sup>th</sup>, 1999**— Microsoft Project98 Advanced course, 1 day, Registration: (303) 492-8668, Location: CU Computing Center, Cost: \$120.00
- ❖ **November 8<sup>th</sup> - 11<sup>th</sup>, 1999**— Software Development Conference 99, Washington DC. For information, visit <http://www.sdexpo.com>.

Ulla Merz

**P2E**

5501 Aztec Court  
Boulder, CO 80303

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