

# MANAGING A LARGE NUMBER OF PROJECTS

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## Abstract

Cosylab is of academic origin, therefore the spirit, organization and work procedures are very much like in research institutes. In addition, we work on about two dozen projects simultaneously for customers on four continents, which requires a lot of travel and on-site work.

Commercially available project management tools are not suited to manage such diversity. We have therefore adopted a set of open source tools, implemented some custom additions and integrated the tools into a coherent product to suit our purpose. Even more important than the tools are the underlining project management processes that have evolved within Cosylab over the last ten years.

The processes are based on project management theory and best practices from research institutes, industry and our own experience. In this article, both the tools and the processes will be presented with relevant examples.

## GOALS

It is of vital importance for a service company to have all of its human resources under control. Cosylab has roughly twice as many projects as full-time employees, so keeping the track of time and progress is taken to its limits.

Managing such a large number of project has forced us to optimize the processes, refine the tools [1] and enforce the necessary set of rules.

By all of this, we aim to achieve better efficiency of our developers, better control of projects for our project managers and easier overview for company management. On the other side this also provides benefits for our customers, most notably accurate estimates and met deadlines.

All the time we try to keep in mind our vision from the early days - to retain the spirit of a research organisation that has infected us when we worked within a research institute, after all, most of us have scientific background and mentality. Because of that, the solutions we have produces map very well also to research institutes, their groups and projects.

## TOOLS

### Request Tracker

Years ago, when we first wanted to accurately track the time spent on individual tasks, we have chosen *Request Tracker* [2] (RT) web-based application. The choice was based on one simple reason – this tool can manage e-mails really well – not only sending but also receiving. RT was picked as our main tool and we adapted all other ones to it. Every now and then, when experiencing problems with RT's code written in Perl, a question

appears why we did not rather write such tool by ourselves, but the final statement remains that RT is really well structured and extremely useful.

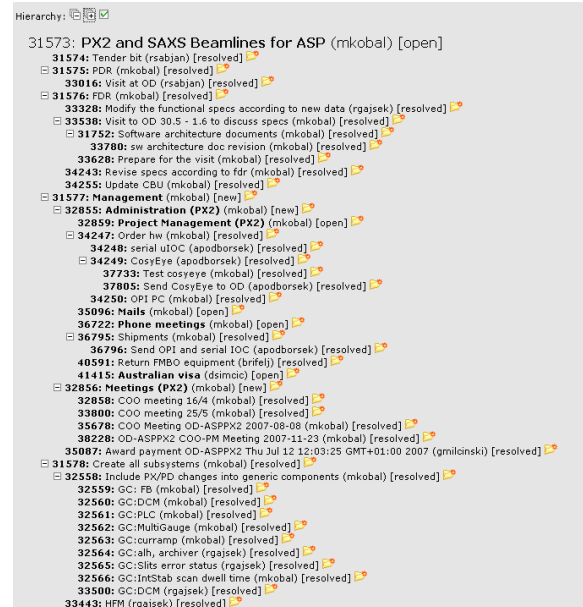


Figure 1: Project hierarchy in the RT.

RT is (as described in its manual) an “enterprise-grade ticketing system which enables a group of people to intelligently and efficiently manage tasks, issues, and requests submitted by a community of users”.

Its main unit is a ticket, which represents a specific task to be done. It has several fields:

- status (new, open, resolved, stalled, dead)
- estimated time
- time spent (increases whenever a user reports a transaction)
- dates: start date, due date
- priority
- keywords (severity of a bug, type of ticket: QA ticket, Master ticket for the project, etc.)

A number of similar tickets is grouped in a queue (project). Specific ticket cannot be contained in more than one queue.

There is a lack of tree-like structure of queues but we are able to build such structure with tickets – each ticket can have one or more parents, children or brothers. Setting also dependencies, a clear structure can be made. RT can warn us by email of a creation or modification of some ticket. The best feature of RT is the possibility of managing tickets via e-mail – every queue has its e-mail address to which we can send a request for creation,

correspondence or comment and set just about every field of the ticket.

RT has easy-to-use search functionality, which allows one to quickly find a ticket. With all its features RT can be used for handling support requests, ordinary tasks and bug tracking.

### Cosy Project Manager System

Cosy Project Manager [3] is Cosylab-made upgrade of RT, providing automatic project reports, application for requesting and authorizing of project changes (e.g. change of project size), project members editor and different metrics.

Given the structure and organisation of the RT database, it is relatively easy to detect some types of problems by asking very simple questions for every ticket on the project, such as

- Is the ticket past due? If so, how much?
- Does the ticket have estimated time set?
- Was there way too much work done on this ticket?

Instead of the project manager having to browse through several tens (sometimes even hundreds) of tickets, we developed Java program that traverses the ticket hierarchy and produces a HTML report of the problems.

The report contains errors and warnings, depending on the severity of an issue. Errors require immediate action by the project manager and warnings might give him a hint that somewhere, somebody is doing something that might somehow not turn out fine for anybody.

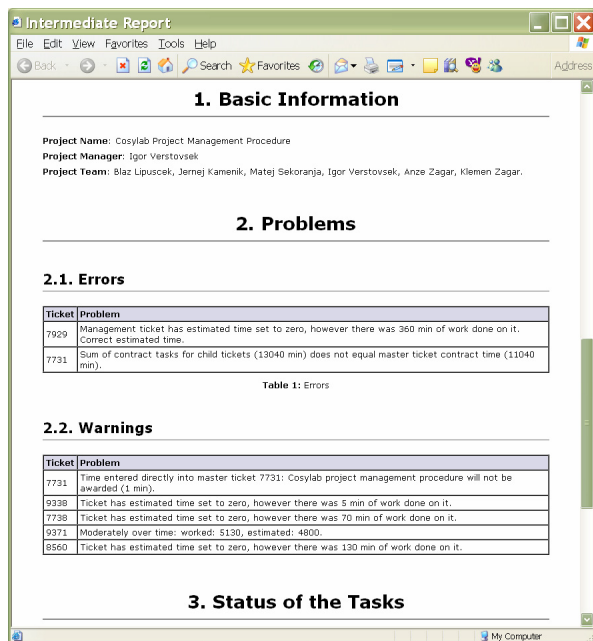


Figure 2: HTML report, created automatically by the Cosy Project Manager. All data is gathered from the RT.

The program can be run automatically on a daily basis or on demand and the results of it will be displayed on the internal pages of the project.

## PROCESSES

We have defined a comprehensive set of processes that supplement the set of tools. The basic guideline was to document common (and our own) best practices and keep certain aspects flexible enough not to choke day to day work with unnecessary formalism. Some of the concepts are outlined below.

### 1.2. Time

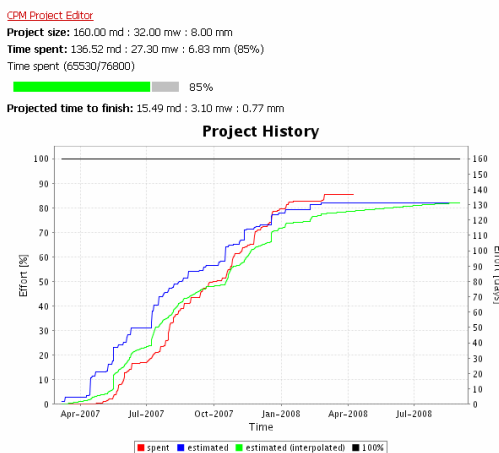


Figure 3: Project effort history. The horizontal line presents 100% of the foreseen effort. The color lines represent actual effort spent and its variants.

All work at Cosylab is organised as projects. We have defined three types of projects, namely:

- external projects, which are based on orders from our customers,
- internal projects, such as internal R&D and products upkeep, based on internal project proposal,
- ongoing projects, that keep track of the administrative tasks and overhead.

External and internal projects have budgets (in sense of time) and foreseen duration appointed based on confirmed order or its internal equivalent.

Ongoing projects could in theory last forever, but we have decided to define them for each year anew, providing better control over spent time.

All effort is entered in the Request Tracker, which takes some self-discipline, but it has proven well worth the trouble. This way the effort is tracked as spent on tasks rather than on project. This helps project manager run the project as project reports are always available (automatically generated) and overruns or other problems can be prevented in advance.

We have received ISO 9001:2000 certificate for our processes and even received praise from IT company ISO reviser; he remarked he has not seen such a well aimed system of tools and processes in an IT company before.

## CONCLUSION

Set of tools and processes have matured and evolved over the years. They now enable us to smoothly run 50+ projects in parallel while keeping a high level of performance and desirable working conditions for our employees.

One thing worth noting is the mindset we kept all these years: it is necessary to keep the rules simple and tools easy to use, so people have time to focus on real issues and project management does not become an art for art's sake.

Our experience on this field also gets appreciated outside Cosylab: some laboratories and companies have already sought consultancy for their specific project management needs.

## REFERENCES

- [1] I. Verstovsek et al., "Management System Based On Open Source Tools", ICALEPCS 2007
- [2] Request Tracker, <http://www.bestpractical.com/rt/>
- [3] I. Verstovsek et al., "Cosylab Management System", PCaPAC 2005