

## USING PRINCE2 AND ITIL PRACTICES FOR COMPUTING PROJECT AND SERVICE MANAGEMENT IN A SCIENTIFIC INSTALLATION

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### Abstract

Alba is a third generation synchrotron located near Barcelona in Spain. It was commissioned in 2011 and 2012 when the first official experiment was carried out. Since 2013, Alba has been delivering X-ray beams to scientists in its seven beamlines.

While conscientious project management has been a key factor in delivering the right infrastructure on time and within budget during Alba construction phase, a thorough management of operations is now needed to ensure provided services actually meet user expectations with rational resource usage. Supported by the implementation of “ad hoc” information management systems, methodologies such as PRINCE2[1] for project management or ITIL[2] for service management provide a strategic and systematic approach to roles, responsibilities and the management of expectations in terms of benefits, quality, risks, timing and resources. As a result, the communication between scientists and support groups have improved with faster time to respond, higher quality and increased user satisfaction. This paper describes the use of these processes and tools in a scientific installation such as Alba synchrotron. It also evaluates the achievements and pitfalls of such implementation, as well as proposals to move forward.

### PRINCE2 AS THE METHODOLOGY FOR PROJECT MANAGEMENT

A synchrotron and in general any scientific installation require managing projects. During the installation phase, a complex master schedule coordinates the different parts of the installation, e. g. civil engineering and construction, general services, accelerator components, control system electronics, beamline components, experimental stations, alignment, etc. Any of these parts may contain several calls for tenders involving many suppliers with particular time constraints, each of them needing a dedicated management. A project is “*temporary organization that is created for the purpose of delivering one or more business products according to an agreed business case*” (PRINCE2). The whole installation is itself a project, although in most cases, for management purposes, the project granularity is chosen differently, and different projects come up coordinated from the master schedule. When the installation is completed and the facility is in operation, the number of projects decreases. However, in an operational facility, there is a continuous flow of projects derived from new requirements, improvement of existing components or in general requests for change.

PRINCE2 methodology for project management was developed by the Office of Government and Commerce

(OGC) in the United Kingdom. It has been chosen and tailored to the needs of our organization taking advantage of its focus on processes and the detailed definitions of roles, responsibilities, and project documentation.

When starting a project, we first create a **Mandate**, with the name and purpose of the project, to assess its utility and feasibility and eventually proceed with the **Pre-Project** phase. At this stage, we define the **Project Board**, the governing body of the project, formed by an **Executive**, the ultimate project responsible and decision maker, balancing the needs of the business, users and providers, a **Senior User**, representing users’ interest and in charge of resolving user requirements and priority conflicts, a **Senior Supplier**, accountable for project viability, resource availability, design methods and quality of delivered products, and the **Project Manager**, running the project on a day to day basis, assuming team coordination as well as a large amount of hands on work in our case, and producing all of the project documentation. In the Pre-Project stage, the Project Manager produces a **Project Brief** including preliminary versions of the business case (project reasons, stakeholders, benefits, constraints, assumptions and risks), product description (composition, quality expectations and acceptance criteria) and project approach (strategic options and recommendation).

Once the Project Board approves the Project Brief, the project enters the **Initiation Stage**, where the Project Manager develops the **Project Initiation Document (PID)**, a baseline set of project objectives, including a refined Project Brief, management strategies for quality, risk and communication, project stages, components, schedule, time and costs.

If the Project Board approves the PID, the project can then proceed to the **Delivery Stages**. Each Delivery Stage is monitored through regular **Highlight Reports** summarizing the project status, completed tasks vs. objectives, planned tasks for the future period, tolerance status for the scope, time and cost of the project, changes, issues and risks, or controlled via **Exception Reports**, explaining why the project deviates from its current objective tolerances, what the implications are, options, recommendations and lessons. Any change in the project that is out of agreed tolerances in the scope, schedule, resources or any aspect of the project, shall be accepted by the Project Board through the approval of the Exception Report. At the end of each delivery stage, including the final one, the Project Manager produces an **End of Stage Report** or a **Project Closure Report** if the current stage is the final one. Those reports include an executive summary of the project status, a list of key achievements, a comparison of achievements against

planned objectives, a review of the team performance, a summary of issues and risks, lessons learned and follow up actions. As well as the Exception Reports, End of Stage Reports and Project Closure Reports must be approved by the Project Board for the project to proceed to next stage or closure.

A PRINCE2 project produces a considerable amount of documentation handled by the project manager. At Alba, we have implemented a set of tools to manage and monitor our **Project Pipeline**: CPM, TimeDB, Redmine[3]. **CPM** is an in-house web application that manages PRINCE2 project documentation and approval workflow. CPM is integrated with **TimeDB**, another in-house web application monitoring how we assigned time to our customers in projects, services, helpdesk, coordination, training, etc. For software projects, this project management tool is also integrated with **Redmine**, an off-the-shelf open source product used to manage software developments. Figure 1 shows the main dashboard of Alba PRINCE2 project in CPM.

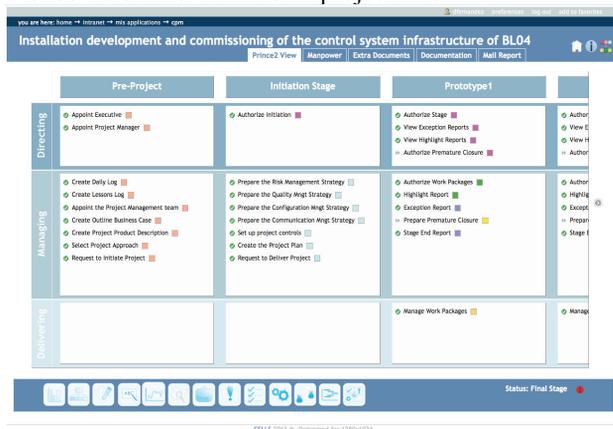


Figure 1: Alba PRINCE2 project management dashboard.

From this first page we define **roles and responsibilities** in the project – the Project Board, Project Manager, Stakeholders and Team Managers –, explain the **reasons** of the project in the Business Case, define the project **objectives** in the Project Product Description, define the project **milestones** in Project Controls, set objectives for the project's **schedule, time and cost** in the Project Plan, send baseline versions of the project documentation for approval – Project Briefs, PIDs, Highlight Reports, Exception Reports and Closure Reports – and manage the approval workflow of all the project documentation. Figure 2 explains the correspondent PRINCE2 principles in the CPM tool.

After we launched the CPM CELLS PRINCE2 project management tool, we organized a series of PRINCE2 certifications for all staff in the computing division, which was meant to be the prototype for the expansion to the entire organization. The Project Pipeline is formally reviewed every month with Computing management with a reassessment of major project milestones and examination of every project's stage and tolerance status with regards to the schedule, time spent and scope against agreed objectives.

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## CPM Overview

CELLS Project Management Application



Figure 2: Guiding principles of CPM project dashboard.

Alba installation phase has undoubtedly been a good application field for formal project management. Nevertheless, once the installation is finished, in a running facility, services frequently need upgrades or modifications, due to changes in the environment, conditions or new requirements. These modifications are either treated as “major”, in which case a new project is setup, started and eventually approved and completed, or “minor”, in which case the service owner assumes the decision and the responsibility of implementing it. In the next section we will describe our approach to service management and its relation with ITIL.

## ITIL BEST PRACTICES AND SERVICE MANAGEMENT

As Alba started hosting user experiments, the project workload decreased and the focus has now shifted to delivering operational services. In some ways, we are a kind of service provider offering “X-ray photons”, in other words, the operation and data acquisition of diverse instruments to external users. Alba Computing and Control Division is organized as a service provider that provides the computing and control technology, processes and people to support scientific experiments. Services range from infrastructure support, electronic engineering, instrumentation support, control systems development and support for the accelerators and beamlines, to more standard information management systems or Information Technology (IT) services.

In the case of IT, services need to be operational long before the facility is able to fulfil its purpose. Services such as network, printing, email, storage, backup, application hosting, server hosting etc. have been up and running since the beginning of the project, before the installation and consequently way before the start of Alba operations.

ITIL is a public framework of best practices for IT service management developed by the Office of Government and Commerce (OGC) in the United Kingdom. Those practices focus on aligning IT services with the needs of business. Unlike PRINCE2 methodology, ITIL is a collection of processes,

procedures, tasks and check lists used to benchmark the organization strategy against industry best practices and implement measureable improvements incrementally. These best practices are divided in five volumes dedicated to five core processes – Strategy, Design, Transition, Operation, and Continuous Service Improvement – covering a larger set of sub-processes for the management of suppliers, service level, service catalogue, availability, configuration, test, validation, release, deployment, knowledge, change, events, incidents, problems and continuous improvement.

We started the approach to ITIL best practices by defining a basic list of **Services** combined with an off-the-shelf open source request tracking system, **RT**, used by **Helpdesk** to manage user requests, incidents, problems or request for changes. Over time, this list of services has been used as basis to develop **Computing Service Catalogue** draft, a sort of menu where internal or external people can find the full list of services actually provided by Computing division with detailed information about what they can get, how to access, how to get help and contact information. The Service Catalogue also integrates **Service Level Metrics** measuring the status of key performance indicators (KPI) against our internal objectives. The draft of the Computing Service Catalogue and the main KPIs of each service is updated on the web including number incidents over the last 30 days, time to respond, time to resolve incidents and availability [4].

Later on, we implemented a **Monthly Service Review** of time spent managing and supporting each service, of the demand trends, incidents patterns, service level performance and continuous service improvements. For instance, if we see that a particular service generates a lot of requests or incidents of a type, we may decide to automate the particular request servicing or fix the root cause of recurrent incidents. Figure 3 illustrates an example of the service level performance review. It shows the distribution of the tickets in a month handled by the service desk grouped by section and colored by the time to resolve.

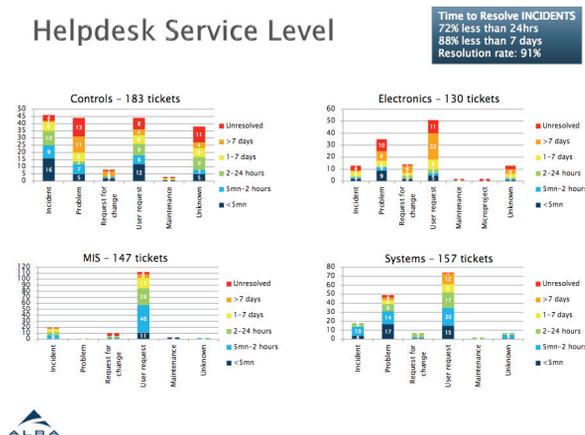


Figure 3: Report on time to resolve tickets in the service desk grouped by section in the Computing division.

## DATABASE FOR TIME MANAGEMENT AND LABOUR COSTS

Time management is a common and recurrent problem, vivid and present in any organization. Learning by experience requires crosschecks of the estimations of a project with the measured efforts. Knowing the actual time spent on a service support is crucial to improve the accuracy of future forecasts and make sure our resources and organization are fit to fulfil our purpose.

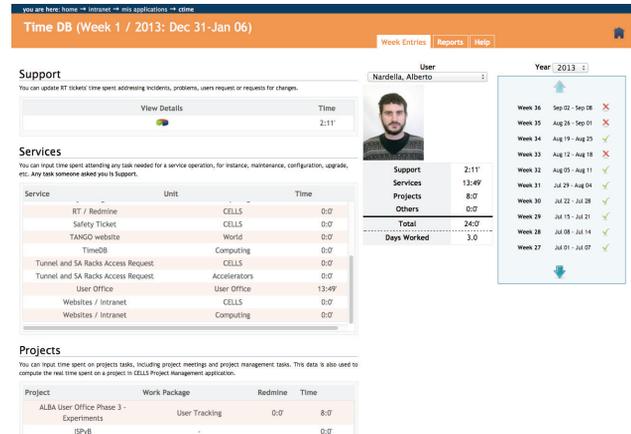


Figure 4: TimeDB dashboard for logging labour time.

Since the very beginning, we have been feeding a time management database, **TimeDB**, where Computing staff weekly logs time spent in support, service, projects, coordination, training, management, innovation and other. The web application nowadays is integrated in the whole system sharing data with CPM and RT. Figure 4 shows the web interface in TimeDB where the time spent in various areas is registered.

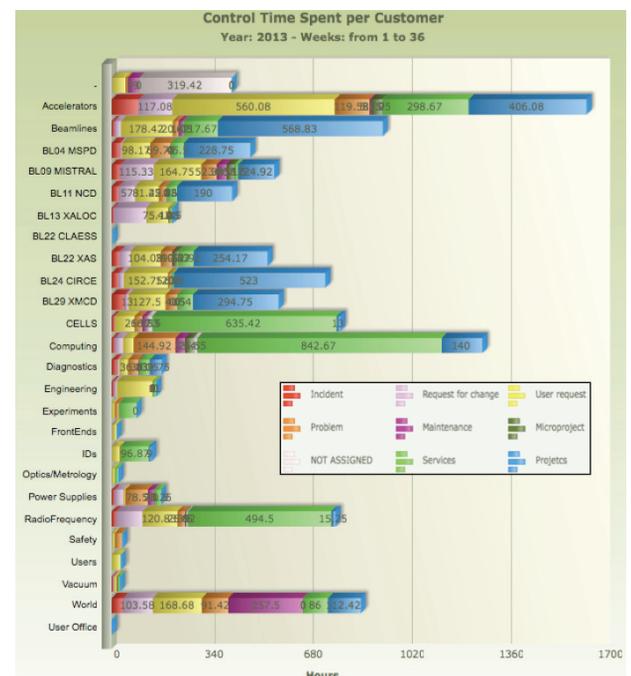


Figure 5: TimeDB report on the time spent per customer.

The overall database is a huge source of information on resource usage from which we issue various management reports. For example, Fig. 5 shows the time the Computing division spent during the first 36 weeks of 2013 grouped by customer and coloured by service, project, user requests, incidents, problems, etc.

## PITFALLS AND PATH FORWARD

Although we now have project management processes and tools in place with working approval workflows and time reporting, the project documentation still lags behind. In our current environment, we have quite a few relatively small projects. As a matter of fact, in our resource bounded organization, the project manager, team manager, producer, business contact and support desk is often the same single person. Engineers often struggle sharing their time between customer relationship management, request servicing, incident resolution, service maintenance, team coordination and project tasks. In that highly concurrent tasking and hands-on technical environment, producing business oriented project documentation can easily be seen as an “overwhelming non productive” paperwork activity that quickly falls low in a to-do list. Too often, especially in the “one person” projects, the delivery starts before the project objectives are clearly stated, and status reports are too scarce. As a response, we created a simplified procedure and a new ticket type in our request tracking system to monitor microprojects less 120 man hours. The documentation of a microproject has been reduced to a single description including the requestor, stakeholders, project board, team, explicit customer request, expected benefits, priority, planned tasks, time estimate, cost, start and end dates. In place since March 2013, the early results are promising with 14 documented microprojects out of 15. In comparison, out of 30 open projects in CPM, 10 lack objective statements although their execution obviously started. In addition, as informing request tickets with time worked and comments is actually part of the weekly routine of Computing staff, microproject reports have come almost effortlessly with more regularity and granularity, providing management with more qualitative information.

Comparatively, and keeping in mind that this is even a much longer route, starting the adoption of ITIL best practices has been smoother thanks to a more tailored and incremental approach. A draft of our Service Catalog is in place with basic Service Level objectives and metrics. We reasonably manage availability, capacity, security, configuration, knowledge, changes, helpdesk and service reporting and measurement. Although we still have plenty of room for improvements, we are smoothly incorporating a selection of ITIL processes. Our focus is now on traversal processes having a critical affectation on many services. The most important is the implementation of critical services emergency recovery plan. Although the systems have been designed with recovery capability in mind and are actually properly recovered when needed, in order to increase the service level, with the current

resources, we need an extra effort in documentation and training. The goal is that anyone (on call) from a support team can act fast on all emergencies. This is being quite a challenge in a period of resource attrition when services keep evolving fast and support and maintenance shadow other tasks.

## LEARNING FROM EXPERIENCE

The rigorous management of projects and services is a key success factor for the installation and operation of scientific facilities. Implementing and following a methodology requires a strong commitment from the management and the adequate infrastructure, procedures and knowledge in place. Throughout the implementation of PRINCE2 and adoption of some ITIL practices in the Computing and Control division, we have gained already an important experience. It is usually preferable to follow incremental evolutionary approaches rather than heavy implementations not adapted or customized to the environment. Incremental approaches are more likely to be widely accepted, especially when the people has the opportunity to get involved from the beginning of the process. Keeping processes and tools as simple as possible and tailoring them to the minimal needs of the organization minimize the risk of not being used or not being used properly. It is also crucial to train the teams, listen to them, help them, encourage them, recognize their work and integrate their experience. After all, the final benefit is for the customer, but the key success factor is the team feeling helped and not bothered by tools and processes.

CPM and TimeDB are used by the whole division, Redmine is deployed in many projects and the service desk implemented on Request Tracker is actively used in the whole facility. Since 2009, almost 150 projects and more than 35,000 request tickets have been managed through CPM and RT. At the moment we are in the process of deploying the tools and extending the methodologies to whole organization.

## REFERENCES

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