IMPROVING SOLEIL COMPUTING OPERATION WITH A SERVICE-ORIENTED APPROACH

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Abstract

SOLEIL Computing division is in charge of managing computing infrastructures and applications on a 24/7 basis for SOLEIL staff and beamlines users.

During the last years SOLEIL accelerators and beamlines have been facing an ever growing dependency on Information Technologies to be able to deliver their service to their respective users. During the same period the Computing division had to manage an increasing number of technologies and software applications while continuously improving IT operation performances.

All this happened in a "classical" scientific environment where having immediate scientific results seems always more urgent than working on enhancing operational activities and minimizing the workload of IT groups.

This context has been the key driver to start the project of optimising our IT operational practices by adopting the ITIL [1] methodology with the following objectives in mind:

- Enhance the quality of IT services delivered
- Decrease the time spent by IT teams in operational activities to be able to keep resources focused on projects and development

The present paper will describe the overall vision of the project "Improving SOLEIL IT operation with a service oriented approach" and the strategy to make the methodology adopted efficiently by all IT groups.

THE MOTIVATIONS TO CHANGE OUR I.T OPERATIONAL PRACTICES

SOLEIL Computing Division Organisation

SOLEIL Computing division is composed of about 40 people organized in 4 groups:

- The ICA group is in charge of software development for Controls and Data Acquisition
- The ECA group is in charge of electronics for controls and data acquisition
- The ISG group is in charge of databases administration and enterprise applications (such as financial ones, technical documents management, etc.)
- The ISI group is in charge of IT infrastructures : networks, servers, file storage , desktops

Operational Practices of IT Groups are Very Different

Depending on their role in SOLEIL organization these 4 groups may have different internal customers:

- ICA and ECA groups are very close to "business" activities as they are working only for Accelerators and beamlines
- ISG is closer to SOLEIL Administration division
- ISI group activities are focused on providing IT infrastructures for all SOLEIL activities from offices to control systems

Moreover these groups are using different operational tools (see Fig. 1) to follow-up their daily activities:

- ICA uses JIRA [2] to manage software changes, users requests and development projects
- ECA, ISI use a CMMS [3] (*Computerized Maintenance Management System*) to track operational activities on the hardware components they are in charge of.
- ISG uses Redmine [4] to follow-up their internal software developments
- The "business" operational groups (*accelerators operators and Experiment Hall coordinators*) also use an ELOG system to track the I.T incidents which occur on the synchrotron facility
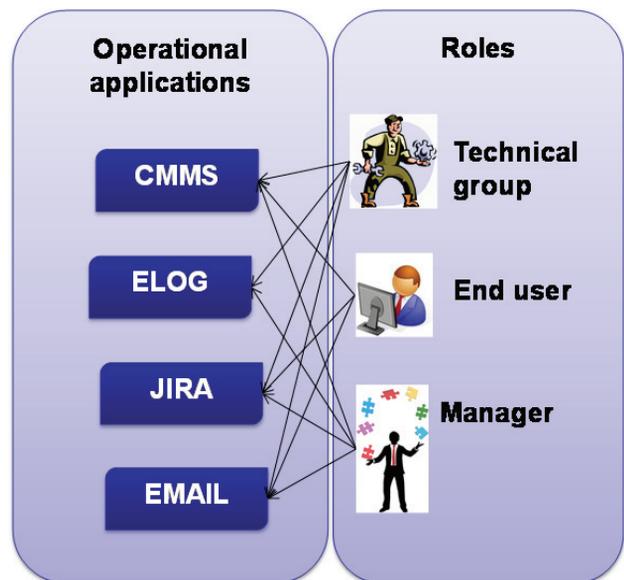

Figure 1: Operational tools used by various support groups.

Last but not least, at the SOLEIL organization level there is no clear definition of business impact of IT incidents/problems that could help all IT people to focus their efforts on the most urgent activities for business.

Be More Efficient and Enhance Services Delivered to End User

Having different operational practices for the 4 IT groups and the "business" operational groups had been possible during the last 10 years but raised daily difficulties that became unsustainable during the last years:

- For an end user the first difficulty is to know to which IT group he must ask for a given service. Then he/she has to choose the right tools (JIRA or CMMS) to post a request
- Then when this request may require actions from various IT groups (*which is more and more common because IT services are always more interconnected*) he/she has to "navigate" between different tools to follow-up this request
- On the other hand, I.T groups have no common vision of the priority/urgency of this request or incident.

This leads to a very chaotic and inefficient treatment chain of the requests/incidents both from the IT resources involved and from the end user perspective.

HOW ITIL CAN HELP US TO IMPROVE OUR IT PRACTICES

Some Reminders on ITIL

ITIL is a set of practices for IT service management that focuses on aligning IT services with the needs of business.

ITIL describes "*processes, procedures, tasks, and checklists which are not organization-specific, but can be applied by an organization for establishing integration with the organization's strategy, delivering value, and maintaining a minimum level of competency*".

ITIL is focused on operational processes rather than norms and is:

• modular: it can be used for very large but also small organizations

• is a quality oriented methodology allowing better definitions of: objectives, operational processes, responsibilities, and indicators.

• defines a common vocabulary between IT people and "business" people

Our Ambitions for the Beginning are very Modest: Focus our Efforts on a Limited Part of the ITIL Methodology

ITIL aims to define best practices for the whole "Service life cycle"

- ITIL Service Strategy: understands organizational objectives and customer needs
- ITIL Service Design: turns the service strategy into a plan for delivering the business objectives.
- ITIL Service Transition: develops and improves capabilities for introducing new services into supported environments.
- ITIL Service Operation: manages services in supported environments

Nevertheless in a first phase, we decided to concentrate our efforts only on "Service Operation" being conscious that changing operational practices of about 40 people and 350 users is something that needs time!

A Preliminary Study Convinced Us of the Interest of the Methodology

To check ITIL can help us in a pragmatic way we decided to analyze the ICA operational practices to check how ITIL could efficiently help us.

To this aim we examined how ICA group was currently working for each of the ITIL Service Operation and Transition processes.

This analysis document was discussed with various operational managers and inside the ICA group, the conclusion being that definitively following ITIL methodology will help us defining many axes to enhance our current practices.

A FEW INITIAL GUIDELINES

Convince and Not Impose

The decision of adopting ITIL has been left in a first time as an option to the managers of the various IT groups.

The ICA group having initiated the step forward was naturally designated as the pioneer group. Its feedback (*pros and cons*) with ITIL practices should then be useful to convince and help other groups to change their way of working in a second phase and to adopt gradually ITIL operational processes.

Promote the Kaizen Philosophy

The philosophy behind our ITIL project is to promote to the idea of a **continuous improvement** of the I.T services we are delivering. In fact only an active participation of operational people will allow to efficiently track IT defaults but also to gather from IT operational people solutions and enhancements proposals.

Keep Using the JIRA Tool to Manage Operational Requests

It was tempting to use a natively ITIL oriented tool (*such as ServiceNow [5])* to be driven by the tool when putting in place the methodology. Nevertheless we thought it was too risky in our context to change at the same time the operational practices and

the CMMS/JIRA/ELOG tools SOLEIL operational people used for years.

We accepted the idea of having for a few months a hybrid situation having within JIRA some requests categorized according the ITIL semantics along with "old style" categorization tickets.

OUR FIRST EXPERIENCE OF ITIL: THE ICA GROUP

An Immediate Benefit: ITIL Semantics Helps Categorizing User's Requests

The first benefit we found what that thanks to its very precise semantics and definitions, ITIL helped us to better prioritize and categorize the continuous flow of JIRA requests (around 100 per week).

Nevertheless, we would like to insist that even if words seem easy to understand, it took a couple of months for a team of experienced software developers to integrate in their daily practices the subtle differences between "problems", "incidents" , "events", "service requests".

Second Benefit: Clarification of the Roles of the Various Operational Actors

ITIL definitions helped us to clarify our organizational practices and the "who does what" for the following activities and their operational interfaces with the ICA group.

- **Service Desk Management**: This 24/7 activity is shared between Machine operators and Experiment Hall coordinators who are in charge of the "level 1" support while ICA group is in charge of "level 2" . The role of the service desk has been clarified and ends up now when a workaround has been found to restore the failing service to an operational state.
- **Incident Management** : Incident managers have been designated within the ICA group to make a "root cause" analysis and create the related "problems" JIRA tickets
- **Problem Management**: Problems managers have been designated to follow-up the problem resolution by the development team.
- **Service Requests Management**: This activity is now systematically done by the member of the ICA team who is on call.

Service Transition Processes: ICA Group Proved to Be Quite Mature

Being a group mostly composed of experienced software developers the ICA practices for ITIL transition processes were without surprise well mastered. In particular:

- **Release Management** : Each of the functional service is delivered to users through a software package which regroups software components and is

under the responsibility of an engineer who is in charge of :
  - o managing the roadmap
  - o integration of the related software artifacts in the various source code management systems and in SOLEIL Continuous Integration Systems [6]
  - o Communication with users through Release Notes
  - o Level 3 expertise on the software package
- **Software Assets Management:** all ICA deliveries are declared and followed in our Continuous Integration Systems. This guarantees that all Control systems software assets are identified, under version control and production versions are correctly identified.

FIRST EXPERIENCE OF ITIL WITH OPERATIONAL GROUPS

Better Manage Incidents: A Win-Win Deal for All Support Groups

As explained in the first paragraphs the various operational groups (IT and business) were using 4 different tools (not including physical contacts and telephones!) to manage daily incidents.

Focusing our efforts to enhance this operational process would be a win-win approach for all support groups.

We organized a workgroup which duty was to define a standard "Incident form" and the lifecycle of an incident.

The JIRA tool was then parametrized to manage numerically the form (see Fig. 2) and the associated workflows.

Figure 2: Incident declaration form.

A First Lesson Learned: "Business" People Must Also Be Trained

One of the difficulties we faced very quickly was the fact that if ICA group was trained to ITIL methodology, our

internal customers were not. This made the communications on first concepts such as "Problems" or "Incidents" much more difficult. We had then to make "Mini ITIL trainings" removing all mentions to IT. This helped to convince Accelerators and Beamlines people the operational processes we were dealing with were also applicable to their operational practices.

THE STEPS FOR THE NEXT 6 MONTHS

Complete and Publish the IT Service Catalog

ITIL promotes the publication to users of the "IT service catalog" which details the full list of services actually provided by Computing division and how to access them and to get help and contact information.

A preliminary version of this catalog (see Fig. 3) has been written by all IT managers. The first step will be in the next weeks to publish this first version to the groups in charge of Level 1 to help them in their daily activities.

Then in a second stage, it will be discussed with SOLEIL "business" representatives to clarify the commitment of all the parties. In particular this approach will oblige to define for each service who is the "Service Owner" on "business" side and which Service Level Agreement (*a.k.a SLA*) there are expecting.

Figure 3: IT Services catalog.

A Service Oriented Portal for End Users

The JIRA form used for Incident Management will then be extended:

- to integrate the services identified in the service catalog to be able to directly assign the incident to the IT group in charge of it
- to other users requests such as "ITIL Service Request"

JIRA /CMMS Connection

Groups in charge of managing hardware components use the CMMS system to follow incidents and changes which occurred on each physical device. Keeping the CMMS tool as it is, was then mandatory for these groups.

On the other hand we want to have a unique entry point to IT services from the end user point of view.

We started a technical study on how to interconnect JIRA and our Tribofilm CMMS [7] using the available software interfaces of these tools.

- A first version will be deployed during Q4 2015 to deal with "Incident management" using mail interfaces of these tools.
- In a second phase (Q1 2016) we will integrate other processes such as "Changes Management "that will require development of Web Services on CMMS side and their integration within JIRA.

After these 2 phases the end users interface with IT support group will then be unique through the JIRA portal (see Fig. 4).
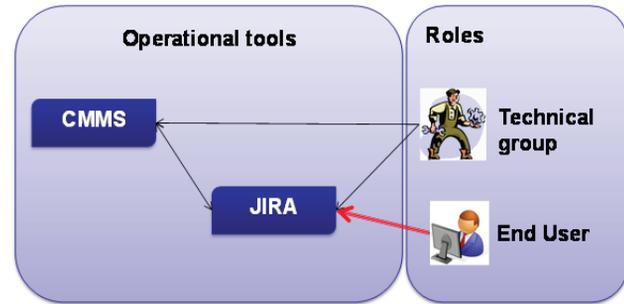
Figure 4: JIRA as the unique entry point.

Put in Place Formal Trainings on ITIL

Formal ITIL trainings will be organized within the next 3 months for all IT and "service desk" people taking into account the experiences gained through the ICA group example and the processes (such as "Incident Management") already in operation.

OUR VISION FOR THE NEXT 2 YEARS

Enhance Our "Change Management "Processes

A lot of work has to be done in close collaboration with "business" representatives regarding the change management process.

We expect this will be a challenging phase because it will require to clarify the "who decides what" on releases plans, projects priorities, etc.

For IT Division Extend ITIL to Other Processes Such As Service Transition or Service Strategy

The services being currently developed by the computing division such as the FlyScan project [8] are now taking into consideration parts of the recommendations of the "ITIL Service Design and Service Transition" processes.

The definition and follow-up of IT Services Strategy will be directly done under the Director General authority which proves the importance IT has now for all the SOLEIL organization.

CONCLUSION

ITIL already helped us in improving the service that ICA group delivers to its IT end users. Nevertheless we are also very modest by foreseeing how long the road will be to extend it to all IT groups of SOLEIL. The strategy of a gradual adoption of ITIL and its various operational processes is the only one that can be followed considering the differences in the groups' maturity and cultures.

Another challenge will be in the next years to extend the best practices promoted by ITIL to all "service oriented" activities of SOLEIL.

In fact the quality of the service delivered to the end user scientist can be considered as the result of a chain of services as illustrated by the following schema (see Fig. 5) . If we consider that "*The strength of a chain is the strength of the weakest link*" enhancing only I.T services will not be sufficient to enhance the satisfaction of the end user.
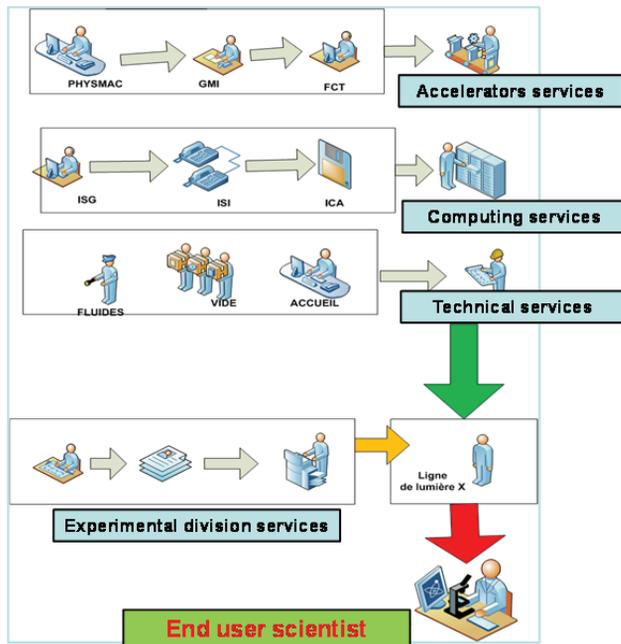

Figure 5: Chain of services to deliver a scientific service to the end user.

To this aim SOLEIL is changing its internal organization and ITIL best practices will be a guide in the next years for all SOLEIL accelerators and technical groups which activities are directly impacting the scientific service delivered to our end users.

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