BEAM INSTRUMENTATION GLOBAL NETWORK [BIGNET]: A COMMON WEB PORTAL FOR BEAM INSTRUMENTALISTS

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Abstract

This document will present an initiative launched during the International Particle Accelerator Conference (IPAC11) to define and produce a common web portal for Beam Instrumentation, with the aim of allowing any beam instrumentalist to easily and efficiently:

- find the laboratories with machines using beams of similar characteristics (particle type, total beam intensity, bunch intensity, frequency, energy)
- find the person who is working there on the beam observable concerned (i.e. beam position, loss, intensity, transverse or longitudinal profile, tune) and how to contact him/her
- create discussion forums with the right audience on hot beam instrumentation topics or issues
- advertise topical events and workshop
- provide links towards documents describing system designs and performance assessments...

This document will cover the status and prospects of the project with the aim to invite and welcome new laboratories to join the adventure.

INTRODUCTION

On regular occasions over the past years, user requirements have put increasing demands on the CERN accelerator complex beam instrumentation.

These requests are most of the time easy to summarize as “improve the performance” of a given instrument and “quantify precisely the uncertainty of its measurements”.

Implementation on the other hand often turns out to be a difficult and challenging task and it was quickly realized during this process that there was no easy way to share issues, questions and progress with people probably facing similar kinds of problems in other laboratories.

The opportunity of the 2nd International Particle Accelerator Conference (IPAC11) was therefore taken to discuss the subject with beam instrumentation colleagues from other institutes and it was agreed that something useful could be done in this domain. That is how BIGNet (for Beam Instrumentation Global Network) started.

INITIAL OBJECTIVES AND PLANS

The aim of the project was to build ‘something’ that would allow any beam instrumentalist to:

- Easily find the laboratories with accelerators producing beams with similar characteristics (particle type, total beam intensity, bunch intensity, energy…)
- Easily find the experts working at these institutes on the different beam observables (i.e. beam position, loss, intensity, transverse or longitudinal profile, tune…) and how to contact them.
- Launch (or participate in) discussion forums with the right people
- Advertise events such as workshops on specific instrumentation technologies and beam instrumentation related conferences.
- Provide links towards documents describing system designs and performance assessments
- Find job offers in the field...

The obvious solution was to develop a web site providing all the relevant features to host and maintain this data (i.e. accelerator and beam parameters, expert lists…), a calendar and discussion forums.

Each participating laboratory would nominate a local administrator to maintain the information (i.e. machine and beam parameters, instrument and expert lists, local events…) related to their laboratory.

Once this was in place, any beam instrumentation expert could then use the site content and create or participate to discussions

The plan was to develop and assess a prototype of this web site during 2012 in collaboration with some volunteer local administrators in other laboratories and to propose it to a wider audience during IBIC2012. That is where we stand today.

CURRENT STATUS OF BIGNET

The current implementation of the BIGNet web site (see https://espace.cern.ch/info-bi-portal/default.aspx) is based on the SharePoint [1] infrastructure available at CERN. This option was taken for the following reasons:

- The SharePoint infrastructure is extremely flexible and embeds all the functionalities to handle discussions, alerts, access rights etc.
- It allows the export of data into standard formats such as Excel tables, which would make migration to another platform possible if eventually required.
- It is widely used at CERN so an efficient support from the CERN-IT department can be relied upon.

This choice allowed the rapid development of a prototype web site. Its current entry page is shown in Fig. 1. Despite the good flexibility and functionality of this architecture, the look and feel can in some cases remain clumsy. If this is felt to be too penalizing for the final implementation other options could be considered, but as it is this web site already allows assessment of the usefulness of such a tool and permits the type of services and interfaces it should provide to be defined.

The following chapters will give details on the content and functionalities of the main subpages of this site.

ISBN 978-3-95450-119-9

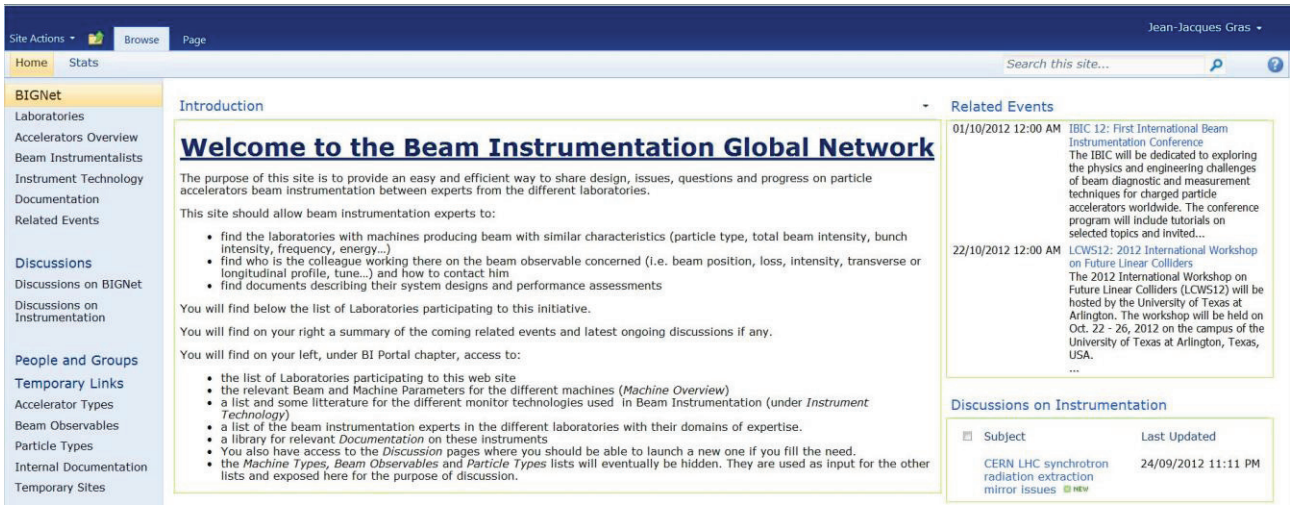

Figure 1: BIGNet entry page at https://espace.cern.ch/info-bi-portal/default.aspx. It provides a short introduction to the site and its contents with an overview of upcoming events and latest discussion forums, as well as providing access to its different subpages.

Laboratories

This page presents the list of laboratories participating to the BIGNet with the name of their local administrators.

Accelerators Overview

This page proposes two different views to describe the relevant machine and beam parameters of the different accelerators found at the participating laboratories. One view gives the details of the selected accelerator while the other regroups all accelerators in a single table with some filtering criteria, such as accelerator type or particle type.

Beam Instrumentalists

This page regroups the information on the beam instrumentation specialists at the the participating laboratories. In addition to their home laboratories and email contact, it also provides their main domains of competence (beam physics, digital electronics,…), the types of instruments they use (current transformer, inductive pick-ups…) and on which observables (intensity, losses, position…) they concentrate. The filtering facilities available on this page allow for a fast and easy way of producing a list of experts working in a specific domain.

Documentation

Papers and notes describing system designs and performance assessments are scattered in many different places and it is often difficult to find them unless they are known to exist, or there is some knowledge of the storage location, author or part of the title. The purpose of this library is not to store a copy of these documents but just refer to them with some attached attributes that will ease their access by relevant filtering. Each record in this library will contain a title, abstract and list of authors, with in addition the type of document (functional specification, technical description, performance assessment…), the beam observable and type of instrument it covers, which accelerator it concerns and finally the link towards the document itself.

Related Events

Major conferences such as IBIC are well publicised throughout the community but smaller workshops with more focussed scopes often go unnoticed. Even if people are not able to attend these meetings, they could be interested by the proceedings or possible participation via video conferencing. This part of the web site will allow the organizers to advertise such events and possibly reach a wider audience. The 'Alert' facility of the web site will do the rest with every member of the BIGNet automatically notified by email that a new event record has been added to the site with the corresponding details.

Discussions

An important aim of this site is to also allow BIGNet members to launch technical discussions on issues or achievements with other experts in the field around the world. The Discussion Forums are available for that. Every member will be able to launch a discussion on a beam instrumentation related topic or participate to any existing discussion via the BIGNet website. Activity on the discussion forums is also monitored via 'Alerts'. Every member of the network will receive an email once per day gathering all the new discussions launched and any new input on existing discussions. A quick look at the headers will allow users to see if some topics could be of interest to them. One may fear that eventually this daily mail becomes too crowded to be useable but this would also mean that the forum is successful. Options could then be put in place to allow users to filter topics of interest.

Two main discussion forums are currently in place. The first one is dedicated to discussions on beam

ISBN 978-3-95450-119-9

instrumentation. It could be split further (by observable for instance) once there is larger scale activity within the network. The second focuses on discussions on the BIGNet functionality itself. This is the forum to use in this early phase to discuss functionality and options or propose extensions etc.

KEY ROLES WITHIN THE PROJECT

It is now important to define the role of the different users of this site, especially the local administrators who will be essential for the success of this project.

The following subchapters will describe these different roles as they are imagined today.

General Public

The general public, i.e. users who cannot (or did not) sign in, will be able to consult the list of the participating laboratories, the accelerators views and the event pages but will not have access to the details on beam instrumentalists or the discussion pages.

Network Members

Network members will appear in the Beam Instrumentalists page and will have access (once signed in) to all the information on the site. In addition, they have the right to launch a discussion or participate to an existing one. The site will be configured in such a way that they will receive up to 2 emails per day gathering the activity on the site, one for new events added in the calendar and one for new items in the discussion forum on beam instrumentation. If there is no activity, no mail will be sent.

Network Local Administrators

BIGNet local administrators are the most important piece of the puzzle. They take the responsibility of entering and keeping up-to-date the data related to their home institute. In particular, they are responsible for:

1. Adding the accelerators hosted in their laboratory to the Accelerators Overview page.
2. Registering their beam instrumentalists onto the site and training them on how to use it.
3. Adding the beam instrumentation related events that may be organized by their laboratory.
4. Promoting the network inside their team.
5. Contribute actively to the upgrade of the tool with feedback on the functionality.

The corresponding workload may look heavy at first glance but experience shows that it can be made reasonable and certainly worth the effort. Gathering the initial set of data, especially machine parameters, could be a non-negligible (but always useful) task but once done the maintenance effort to keep this data up-to-date should be limited. Machine parameters and experts list do not change so often with a yearly update considered enough for the moment. Overall, it looks to be a good investment for any laboratory with respect to the potential return from the wider community.

Steering Board Members

The most motivated local administrators will be welcome to join the BIGNet steering board that will be in charge of discussing this feedback and deciding on what should be implemented, when and how. The organisation and frequency of these discussions is still to be defined but the current idea is to meet via a video conference every quarter with a yearly ‘physical’ meeting during IBIC.

Web Site Administrators

Finally, web site administrators will be in charge of implementing agreed structural/behavioural changes at least for the current version. It is worth noting that any local administrator could become a site administrator with a fairly basic training on SharePoint.

THE NEXT STEPS

Now that this tool is in our hands, the next steps will be:

- to invite other laboratories to join the adventure and motivate future local administrators. IBIC2012 being the ideal opportunity for that.
- to populate the Accelerators Overview and Beam Instrumentalist lists.
- to launch a few discussion forums and advertise upcoming events
- to put the Steering Board in place and react to experience and feedback

CONCLUSIONS

The current implementation of the BIGNet prototype proposes most of the features that were targeted at the start of the project. Even if it may not be perfect in terms of look and feel, it is sufficiently user-friendly to start working efficiently and demonstrate the usefulness of this initiative. It is now up to the community as a whole to make it grow and it is hoped that many new laboratories will join the adventure by clicking the ‘How to join the BIGNet’ link on https://espace.cern.ch/info-bi-portal/default.aspx.

ACKNOWLEDGMENT

I would like to acknowledge all the people who contributed to the lively discussions to define this project and in particular the early volunteer local administrators, namely A. Alexander (ORNL), J-C. Denard (SOLEIL), A. Jansson (ESS), M. Minty (BNL), T. Mitsuhashi (KEK), F. Perez (CELLS-ALBA), G. Rehm (DIAMOND), M. Schwickert (GSI), H. Tanaka (Spring8), C. Welsch (University of Liverpool) and K. Wittenburg (DESY).

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[1] Microsoft SharePoint by Microsoft; http://sharepoint.microsoft.com/en-us/pages/default.aspx

ISBN 978-3-95450-119-9