WHAT CONTROL SYSTEM PLATFORM TO CHOOSE?

BY: MARK PLESKO

One of the first tasks when building a new control system is to decide on the platform. Here I am not talking about the famous dilemma of EPICS versus TANGO versus ACS versus TINE versus FESA versus <insert your own favorite system>. Rather, I am talking about the base hardware platform such as VME vs. cPCI and programming languages and tools, such as C++ vs. Java and tcl/tk vs. QT vs. SWT vs. NetBeans, etc.

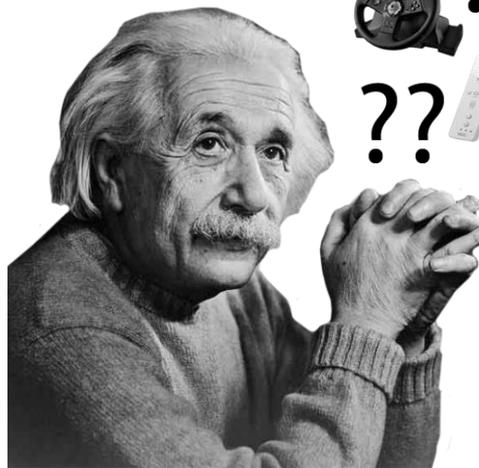Cosylab tries to avoid this dilemma by doing whatever the customer wants. But sometimes we are asked for advice. We don't want to promote our preferred tools, just because we happen to be proficient in them. Therefore we have asked many experts and experienced people and thought about it ourselves a bit and came to an interesting result: the decision is not a technical one!

And it goes like this: there are two main criteria, usability (i.e. what you can do with the platform and how well the relevant tools are debugged) and longevity (i.e. how long will it take before the platform becomes obsolete/outdated). Both criteria are fulfilled due to market forces and not technological excellence.

It is probably obvious to you, but it wasn't to me, that one should not look for the best platform in terms of performance, although top performance means that it will be still adequate in a few years time. But this is not enough! One should look for a platform that will be most likely accepted by the majority **in the industry**. That means that one shouldn't look just at other labs. The reason is that a well accepted technology determines a complete and broad market that not only provides many manufacturers (and thus lowest prices) but also a vast number of users that will be in the same boat with you, if you have chosen the same technology as them.

So even if newer technologies introduce much better performance, there will be a whole industry to support **>>**

MARK'S COLUMN

CAN COSYLAB BE CHEAPER THAN IN-HOUSE DEVELOPERS?

I understand that in-house developers are cheaper **by the hour**, if you count only their salary, although this way of counting personnel is wrong anyway, as you have to consider overhead, office space, etc. and a certain commitment to pay this person over a longer period of time.

But we don't compete with simple manpower. I believe that we can be cost-effective when you take a whole project into account, where efficiently managing development processes and delivering and verifying the required quality is part of the work. Over the years, Cosylab has build tremendous expertise in control system specific processes such as project management, testing, documenting, etc. Therefore we can deliver a turn-key solution, be it a simple application or a vertical control system, much faster and to much higher quality. As a result, our price for a whole solution is usually lower than the sum of all the time spent by internal people (how many meetings did you have in the last week?).

Why don't you give us a chance and let us give you a few offers for some tasks that you have to do? Just send us a short list - for us it is enough to see one line per task and we should know what has to be done - so this saves you also writing specifications, which is another big saving.

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>> the existing large installed base, because it makes enough business to stay in business. And in the worst case of complete obsolescence, there will be many users out there having the same problem as you. As a result, either one of them will find a good solution or transition that you can copy, or some smart business will be set up to offer solutions, benefiting from a big number of customers. If you don't believe me, just look at CAMAC, which is still around after 40 years.

And if you need replacements, there are still companies that offer you repair, spare parts or exact replacements based on newer technology.

The bottom-line is therefore: don't bet on fancy new platforms, where you have no way of telling whether they will take off at all (anybody remembers Fastbus?). Therefore also fieldbuses are a risky choice, because in-

stead of one or two major platforms (like in backplane buses), there are many small contenders that have limited support. Let them make out the fight first among themselves, before you jump on anybody's bandwagon – after all, if two dogs fight for a bone, the bone doesn't fight!

Need to pinpoint beam losses?

NEW BEAM LOSS SIGNAL CONDITIONER FROM COSYLAB

Messy things can happen if too many almost speed-of-light particles find their way out of a vacuum pipe. But at the same time we know it is also impossible to keep them all within the pipe. Various reasons contribute to this: residual gas molecules, intrabeam scattering (Touschek effect), or even mechanical obstacles in the case of unsuccessful installation. Luckily, this small leakage can be effectively used as a simple and very useful diagnostics concept. By monitoring beam loss ratio one can get a feedback, how the machine is operating. For example insertion of a new device into the path of the beam can cause changes of beam orbit several sectors later

down the pipe, which might show up as increased beam loss level.

To detect how many particles find their way out, a beam loss monitor (BLM) sensor from French company Bergoz can be used. The operation concept is as follows: when the primary particle hits the sides of the vacuum chamber it causes the shower of the secondary particles and these hitting the BLM sensor produce a measurable pulse. When these pulses are collected and passed to the control system, one can get a valuable insight into the operation of the machine, simply by monitoring average beam loss fluctuations. To enhance the problem diagnosis even further, BLM sensor readout must be correlated with the events in the machine. For best flexibility, pulses should be only counted at certain conditions and at well defined time slots that match certain machine operation mode.

At Cosylab we have developed an advanced BLM acquisition system for the ELSA (Electron Stretcher Accelerator) at Physikalisches Institut der Universitaet Bonn. System is designed upon the customer specifications to be as flexible as possible. It allows a user to precisely define the time slots in which pulses are captured and how these counts are captured into BLM-local buffer array. Time slots for capturing pulses can be either defined by software, by ex-

ternal gate signal, or external trigger signal. This enables a user to precisely define which pulses should be taken into account. BLM-local buffer enables pulse-acquisition history of the depth of up to 3000 time slots. These can be both acquired in a single start-and-shot measurement or multi-cycle integration mode where pulses are added in run-to-run. When BLM sensor is extensively bombarded by the shower of the secondary particles, it saturates; we added a support to provide a feedback when this occurs. If two BLM sensors are mounted on the opposite sides of the pipe (in and out), they can be used to detect losses resulting from the Touschek effect; when pulses from two such BLM sensors happen at almost the same moment it is likely caused from this reason (on the other hand loses caused by residual gas molecules are primarily detected on the inner-side detector).

Simple monitoring of average beam loss fluctuations is also supported. All in all, a complete turn-key beam loss monitoring solution from the detector to the control system is provided.

PCaPAC 2008

Organised by Jozef Stefan Institute in close collaboration with Cosy-lab, PCaPAC 2008 will be held in Ljubljana, Slovenia, October 20-23, 2008 with the welcome reception in the evening of 19th October.

The main objectives of the PCa-PAC workshop are to discuss all important issues of the use of PCs and modern IT technologies for controls of accelerators and to give scientists, engineers, and technicians a forum to exchange the ideas on control problems and their solutions.

In accordance with PCaPAC tradition, PCaPAC 2008 is awarding the Isamu Abe prize, this year in the amount of 1000 EUR. The main purpose of the Isamu Abe Prize is to encourage people in the field of control systems development. Limited to those in the early stages of their career, the prize seeks to recognize innovative ideas, achievements and applications. In order to apply for the prize, abstract must be submitted and a finished paper must be sent to info@pcapac-workshop.org .

For more information about the workshop including the registration, visit http://www.pcapac-workshop.org.

EPICS Courses on Demand

Increasing number of projects is deciding to use EPICS (http://www.aps.anl.gov/epics) as their main control system for many reasons. EPICS is a proven control system with a very wide base of users, services and applications, it is free of licenses and also features a very friendly and helpful community. All these facts make it hard for project leaders to ignore EPICS.

Of course, there is the less seen fine print. EPICS comes with a reasonably high learning curve, especially for newcomers. Although significant effort has been made within the community to provide teaching and learning materials available to download from the web, there is still no substitute to direct, hands-on training courses for getting your staff up to speed quickly.

Cosylab is providing EPICS courses to its customers. This year we have held courses at KVI in Groningen, Netherlands and INFN in Legnaro, Italy, as well as at the NSRRC in Taiwan with a high degree of customer satisfaction.

Every training course is tailored to client's specific needs, but there are many similarities and we rely extensively on the available material. We believe that our added value is in the delivery as the lecturers and mentors are people with substantial EPICS expertise and real-life project experience. The courses come with our own hands-on training exercises necessary to develop working EPICS skills.

We provide courses at client's premises and also at Cosylab, where we will organise an open EPICS course this autumn. Watch out for announcements in future Control Sheets and on our website!

Control SH!T GLOBETROTTING EXHIBITION EQUIPMENT

Did you ever heard for express post? You don't need to be smart to find out that it should be fast if they say express.

Wait a moment! Are you sure that combination of words express and post means that you will receive post really fast?

In our case we have been dealing with snail's gallop express post. Answer to the next very simple question: what is the max. shipping time for two packets, from USA to EUROPE with express post? Based on my experiences shipping time is much longer than probably your answer is. Correct answer in our case is 6 months. If you are interested what has happened with our packets check the picture below. Enjoy!

involved/ month	Cosylab	PAC07	ICALEPCS07	X warehouse	X Logistics	X Company	Express post
June 2007	Packet 1 — Packet 1 sent to PAC07	Packet 1					
October 2007	Packet 2 — Packet 2 sent to ICALEPCS07		Packet 1&2	Packet 1&2	Packet 1&2 — Packets sent to X Logistics	Packets sent to X company, meanwhile company banckrupt	X Logistics realized that Slovenia is in Europe, not dealing with global shipments. / Somehow packet arrives to express post, but without papers, so they send packet back to X company
November 2007						Packet 1&2	Packet 1&2
November 2007 / April 2008	Few calls to X warehouse / lot of calls to X Logistics / Few calls to X company, without success! / Approximately 10 calls to express post				Can't sent world-wide!	Packet 1&2	Packet 1&2 / Lost tracking, nobody knows nothing
April 2008	Packet 1&2	After a couple hundreds of dollars spent on phone – FINALLY!!					

visit us on http://controlsheet.cosylab.com/

CONTROL SHEET