

Questionnaire concerning realization schedule of the **PANDA DAQ system**

The questionnaire has two parts.

We request a response time until April 30 for questions 1-7, compiled in part 1. For the rest of the questions, part 2 of the questionnaire, we ask a response until May 20.

The scrutiny group, appointed to review the project status and make physics-driven suggestions for a possibly stretched installation schedule towards the full PANDA detector, has worked out this questionnaire. This includes an understanding of the current status and progress of all PANDA components.

We assume an intimate relation between DAQ and the high-end of the FEE. Thus, the DAQ responsibility includes the hard- and firmware of Data Concentrators incl. TRBs, Multiplexers, the SODA system, Compute Nodes, and Data Storage, as well as the software for the Event Filter.

Please understand the following:

- Depending on the progress you have achieved some of the questions may appear obsolete and some of the answers may appear evident. Anyhow, in order to get a complete overview, we ask your brief answers which may be amended with your special notes.
- None of the following questions is intended to question your expertise. On the contrary we trust and rely on your qualified response. If any of the wordings is not to your liking, take our sincere apologies. The questions are meant and designed to scrutinize the progress of PANDA.
- You may not feel like answering all questions because sometimes several questions may touch upon the same issue, as you understand it. In these cases, just indicate briefly where you put the information.
- While some of the questions may be perceived as very demanding by your group, we feel that most information is not different from what you might provide with a TDR, a funding application or the like. If you think that some of our requests are not necessary, just let us know and please add a brief explanation of your views.

Thank you for the cooperation and your valued input to the process needed to consolidate PANDA.

Part 1

DAQ system manager(s):

1. Status of TDR for the DAQ system:
 - When do you expect a draft for the DAQ TDR?
 - Are the basic prototype test results available for the TDR?
 - Do you plan additional reports (e.g. technical readiness report) beyond the TDR?

2. List the research groups collaborating to realize the DAQ system:
 - cooperations within PANDA
 - cooperations within or outside of FAIR

3. How have the research groups involved in DAQ developments documented their progress and disseminated relevant information?
 - DAQ relevant theses
 - DAQ relevant papers
 - contributions to specialized conferences (e.g. IEEE, Realtime Comp. conf.)
 - availability (e.g. PANDA wiki) of internal (technical) reports (PANDA notes)

4. Have you exploited synergies to achieve the most efficient progress?
 - On which level have you sought synergy within various PANDA FEE developments?
Example: joint ASIC developments, joint test beams.
 - On which level have you sought synergy with other FAIR systems?
Example: joint developments of ASICs or electronics modules

5. Groups and manpower involved:
 - How many persons (FTE) in which groups are engaged in DAQ developments for PANDA?
 - How many persons (FTE) in which groups are involved in simulations of the Event Filter and the DAQ performance?
 - Has the expected data structure been analyzed so that the load on the DAQ system can be estimated?

6. Financing of manpower and investments:
- What is the total budgeted amount (% of needed) for the DAQ system:
 - amount of money already spent by 1.1.2014
 - amount of money available to be spent now
 - amount of money secured by firm commitments (define “firm”)
 - amount of money applied for at which agency
 - amount of money intended to be asked from which agency?
 - possible sources of additional funding needed
 - Please attach a graph of the funding profile (2014-2019).
 - Please attach a graph of the manpower profile (2014-2019).
7. DAQ system design:
- Are the PANDA Standards of the DAQ system clearly defined?
 - How are the PANDA Standards of the DAQ system documented?
 - How have you ensured that Interfaces for various detector systems are properly designed?
 - Is the responsibility for FEE-DAQ interfaces for all PANDA detector systems clearly assigned? (To whom in which group?)

Part 2

8. Timelines of work packages for the DAQ system:
- Please provide the resource-loaded schedule (cf. attached example).
 - What are the shortcomings on FTE or other non-invest resources?
 - Which time-consuming part could be shortened by distributing work, e.g. to companies (added expenses?)?
 - Which time-consuming workpackage could be accelerated with additional money?
- Explanation: Please provide the tables as an attachment. An example for a toy project is attached. If you feel that any of the suggested ways of compiling these tables are too fine or too coarse (e.g. the time bins), please use your project's native granularity!*
9. Availability of key components:
- Has the technology of key components for the DAQ system been developed to satisfy your needs?
 - What is the schedule for additional developments?
 - Is there a (at least 1) manufacturer who can deliver?
 - Are you in contact with alternative manufacturers?
 - What may be possible risks of delivery?
 - What may be possible risks of the production quality?
 - What is the delivery rate agreed upon with the main manufacturer compared to the scheduled use in the project?

- Do you have fallback solutions in case of delivery failure, or if necessary additional developments will not succeed or will not be finished in time?

10. Technical feasibility of the DAQ system:

- Is sufficient lab equipment available for system evaluation?
- Are workshops available for hard- and firmware construction?
- Are results available from prototype studies? (attach key results)
- What is the manpower available for system tests at FZJ in 2015/16?
- How do you plan to support detector systems with DAQ hard-, firm- and software for system tests at FZJ in 2015/16?
- Will you be able to setup the complete DAQ system until 1.1.2018? (or until when?)
 - Which companies are involved?
 - Which research labs are involved?

11. Do you see an option for only partly installing the DAQ system on day-1 and a later upgrade?

- Which are the parts that definitely have to be in place on day-1?
- Which components could be added or expanded later?
- Would this reduced setup lead to savings in finances?
 - How much on day-1?
 - How much on the long run?
- What would be the consequences for manpower resources?
- What would be the penalty
 - i. in rate performance?
 - ii. in online data-selection quality?
- What would be the penalty on the long run in terms of extra manpower or loss of time?
- What would be the penalty or advantage for your funding situation?

Explanation: please quantify "penalty" in terms of % degradation w.r.t. optimum performance.

12. Risk assessment:

- When were possible risks signaled?
- Which of the risks may prevent a completion before 2018?
- Which measures were already taken to counteract possible risks?

Example: explore alternative FPGA solutions.
- Which additional measures are envisaged?

Example: alternative firm- or software algorithms

Explanation: We will make use of risk tables collected by the Technical Management. However, the input here may serve to judge the situation of the DAQ like other particular sub-system as a whole. We need to see the status of the risk evaluation and whether counter-measures have already been initiated.