The Transition to OO - a panel discussion

Tom Kozlowski [a], A.(RD) Schaffer [b] Bob Jacobsen [c]
John Allison [d] Kors Bos [e],

[a] *LANL, Los Alamos, USA (Phenix)*

[b] *LAL, Orsay, France (ATLAS)*

[c] *LBL, Berkeley, USA (BaBar)*

[d] *Univ.of Manchester, UK (GEANT4)*

[e] *NIKHEF, Amsterdam, The Netherlands (Chairman)*

A panel discussion was held on the transition towards object orientation. Four projects in which this transition had been made were presented. After each talk there was some discussion. A short resume is given here on the presentations and the discussion. The papers from the members of the panel have been included in these proceedings together with this summary.

Key words: OO; Transition; Process; Tools

1 Introduction

It was the intention of the organizers of this panel to select the members such that there would be an interesting mix of projects presented.

The first one, Phenix, is a real-time project which has gone through one full cycle of analysis and design, implementation and testing. There was no large FORTRAN community which had to be convinced. Most collaborators were used to writing in C and very knowledgeable about software.

The next two presentations were ATLAS and BaBar: two experiments that have made the choice for OO but are in very different stages of the project. ATLAS is still very much in the beginning and data from the experiment will not come before 2005. BaBar, on the contrary, will get its first data at the end of next year. Because of this difference in time pressure one would expect different priorities in the two projects.

The last project, GEANT4, is slightly different because it could be very well specified : to build a framework which provides at least the same functionality as GEANT3. The people who participate all had made the choice for OO otherwise they wouldn't have joined. Though it doesn't have to be ready for any beam period many collaborations are waiting for it.

2 The presentations

The presentations were indeed very different and showed the various ways by which the problem can be approached. Tom Kozlowski described how he and his colleagues in the Phenix on-line very systematically prepared themselves and how they followed very closely the Shlaer Mellor method. For them, the implementation phase is very similar to their definition of the architecture and all of their code is generated automatically. This is very different from the other projects where very little code can be generated automatically and all has to be written by people. It was explained that the project profited much from the use of a consultant.

RD Schaffer described the way the people in ATLAS learned from their experiments done in the RD41/MOOSE R&D project. ATLAS has a well defined software process that they have just started to apply but which seems a little difficult and slow in it's initial phase. The problem of converting a large FORTRAN community to OO is still ahead of them. Tools have been investigated to help people make the transition. A scheme exists for training people to different levels of competence.

In BaBar there is no time left any more to worry much about the process as the beam will be there next year. Bob Jacobsen made that very clear and insisted that "just enough" of a software process has to be in place to keep the people working together coherently. He insisted very much on saying that the process is all about people. A considerable effort went into training the people who have to provide the framework and people who will use it.

John Allison described the GEANT4 project and it's progress. The biggest problem for this group was the geographical distribution of the collaborators. The success of the project is largely due to the fact that the group consists of highly motivated people who wanted to invest in learning and wanted to get the job done. There was no "swimming against the stream" as in the case of ATLAS and BaBar where a large group of people who are developing in FORTRAN have to be convinced. At the start of the project there was very little or no expertise in OO among the collaborators. They all learned by reading books and taking courses.

3 Conclusions

It was interesting to learn about the different views on the same problem. Again there is "no silver bullet“, no one solution to the problem. It all depends on the project itself and even more on the people.

All speakers mentioned that experience is an important factor for success. It seems that the rate of success increases if there are some experienced people on the project at the start and it seems very important to train everybody at the beginning of the project although not all to the same level of expertise. Phenix and ATLAS said that consultancy was valuable.

A software process was present in all presentations. The least formal approach was presented for BaBar the most explicitly defined process comes from ATLAS. Phenix followed very much the process described by their method and GEANT4 didn't write it down explicitly although some procedures were followed. It became clear that our community has little experience of a software process and it needs some time to judge the different approaches.

The positive outcome of this panel is that it showed that today there is a lot of experience with "making the transition" and there are experienced people now in OO development in HEP. Younger people coming from the universities are better prepared for this task, so it should become easier for new projects to make the transition towards OO. It would be interesting to have a similar discussion during future CHEP conferences.