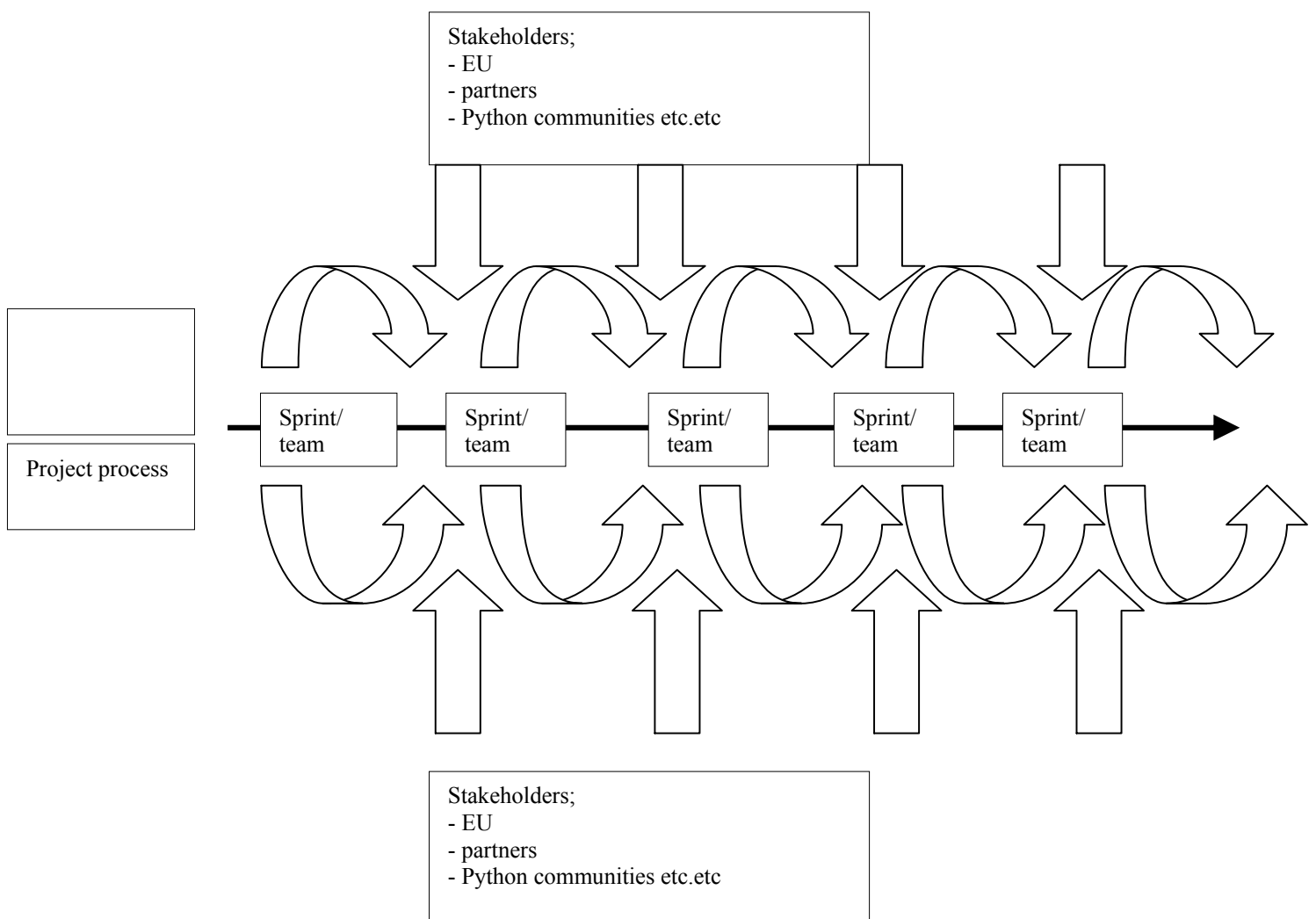


B 5.0 Project Management

PyPy as a project will be implementing an agile development lifecycle. This choice of development method will have effects on the way the project will be structured and managed.

The project will have a structured project plan as is showed in this proposal (workpackages, Gantt-chart, deliverables, quality control etc). It also means that the project process, once the project get started, will work from a evaluate-feedback-change perspective, or so called "learning loops" in which project management will continuously follow up on the intital project plan but also evaluate process, teameffectiveness, communication climate. From these learning loops change, when necessary, will be applied throughout the process.

To illustrate the focus on development process as well as project focus:



Both the project and the development process are based around critical workshops, so called "sprints" that will take place on a six week cycle throughout the project (24 months). Around these sprints input and output to stakeholders will be structured. The arrows above symbolize the evaluation-feedback-change system that will be implemented.

This method will affect the role of the project management, management structure, role of coordinator, project meetings, quality control and communication in the project in what we have experienced to be a very constructive way.

Our reasons for choosing this development and project method are several:

- This project has a history of 6 months in which the team successfully implemented sprints and agile development methods
- In this project, team members from 5 (?) different countries will work continuously in separate places, sprints will be the main forum in which the team members meet up and work together in real life
- The sprints will be open for non-team members to participate in the development process, thus allowing for an open and feedback-driven process
- The sprints will be the forum in which knowledge will be shared and the transparency within the project organisation will be measured

We will during the project focus on evaluating and documenting our project method and share knowledge and experience in that area as well. It is our goal that the overall deliverables from this project will be a functioning PyPy as well as an effective project method for agile development/Open Source projects.

On the following pages we will describe in more detail how this choice of method will influence the way this project will be managed.

B 5.1 Project manager

The PyPy project will have a project management structure that is based upon two resources, Jacob Hallén as project manager and Beatrice Düring as assisting project manager.

The role of the project manager is to:

- ☞ manage the project and its scope of time, budget and deliverables
- ☞ lead the work of the management board and report to the management board
- ☞ execute decisions made in the management board
- ☞ report to the project coordinator
- ☞ support the project coordinator concerning the relations to the EU
- ☞ manage the sprints
- ☞ manage routines for quality assurance of the technical development

The role of the assistant project manager

- ☞ report to the project manager
- ☞ participate in reports to management board and project coordinator
- ☞ manage project administration (reports, documentation, etc)
- ☞ manage routines for sprints, quality assurance of project process, resource allocation
- ☞ manage contact with external partners
- ☞ manage the day-to-day operations of the project (ex. executing decisions made by management board)
- ☞ manage the knowledge process and actively spread information to the Open Source community regarding methods used

The reasons for having a structure based on a project manager and assisting project manager are:

- ☞ both the development and the project process will receive due attention in that the persons chosen have expert skills in these different areas
- ☞ the project will not be exposed to the risk that a single project manager would mean (hhmm dåligt – formulera om)
- ☞ a project of this size with team and stakeholders distributed in several countries needs more project management resources

The skills and experience of the combined project management team are as followed:

Large scale projects:

Jacob Hallén have been working since 1994 with large scale development projects. He was a consultant for, and later employee of, the LIBRIS Department of the Royal Library of Sweden (<http://www.libris.kb.se>) in the role of Technical Project Manager, with main focus on being systems architect for the national bibliography system and interlibrary loan system. Participated in international standardisation groups for search systems (Z39.50) and interlibrary loans.

He was also the initiator of the international standardisation effort for library services information. Participated as the Royal Library representative in ONE-2, an EU funded project under the Telematics for Libraries project (<http://www.one-2.org>)

Since 2000, Jacob have been involved in co-founding AB Strakt (<http://www.strakt.com>), a company developing workflow and document handling systems. There he works in roles as developer, project manager, CTO and CEO. The company has grown from 3 employees to having 12 full time employees and 6 part time employees so far.

Connected to his work at AB Strakt, Jacob has also been active as co-founder and chairman of the Python Business Forum, an international trade organisation for companies that use Python as their main tool of business. The PBF has approximately 50 member organisations. He is also the project leader for the Europython 2004 conference, to be held in Göteborg, Sweden 9-11 June 2004.

Beatrice Düring have experience in large scale education projects involving working with consortiums of three companies servicing a stakeholdergroup of about 30 recruiting companies. These large education projects was part of a national program to solve shortages of skilled IT-personel during the years 1998- 2000. 200 students participated in the projects and the projects met their deliverables in that over 80% of the student were employed after the education. The project team consisted of 7 persons working full time. As a project manager, Beatrice was responsible for meeting project goals, meeting profit margins, leading the team and creating strategies for stakeholder participation in the projects. She was also responsible for reporting and documenting the project to the client.

Since 2000 she has been involved in similar assignments, one recently finished for University of Blekinge in which the education was directed towards recruiting companies in the gamedevelopment industry. She has also worked as project manager for several development projects during the time 1998-2002.

She has also developed project methods for the companies and teams she's been working with and have also been working with quality assurance of development projects. Her current company, Change Maker is also working with supporting smaller companies in the application process for the EU Framework 3 (Växtkraft Mål 3) and has a experience of working with similar EU-funded projects since 1997.

Financial tracking in projects:

Jacob Hallén has a widespread experience of founding and managing companies as well as being project manager for large scale projects. This means that

The large scale education projects that Beatrice managed had a profitmargin of 20% which was met. The total budget for these projects was 20 million SEK. She has also recently been involved in the prestudy, budgeting and start of a 6 year long education project in Arvika, Sweden with a total budget of 18 million SEK.

During her time as a manager for the education and consultdepartment in NetGuide Scandinavia (1999-2002) she had budget and resultresponsibility.

Leadership skills:

Jacob Hallén have experienced leadership challenges in different situations. Since

Beatrice Düring have experience from leadership situations in projects as well as in lineorganisations since 1998. During four years she was a part of a management team of five people, leading teams of 5 to 14 people. As a leader, Beatrice was responsible for coaching, motivating and developing her personel.

Beatrice employs strategies of empowerment, active listening combined with creating and maintaining an open communication climate based on honesty and trust the achieve goals together with her team. Beatrice have been teaching management oriented courses (leadership, project management, communication, conflictresolving) for Learning Tree International since 2003 in both Sweden and USA.

B 5.2 Management structure

B 5.3 Coordinator – dont write

B 5.4 Project meetings

Project Meetings

Management Board will meet at the start of the project and two times per year or on an ad hoc basis as requested. The meetings will normally be scheduled to rotate between countries of the EU and mainly the principal contractors home base. The project manager is responsible for the invite and agenda as well as managing the meetings. Objectives on these meeting are tracking progress regarding workpackages, budget, timescale and strategies for involving

stakeholders as in partners or new partners. Agenda and discussions/decisions on these meeting will be documented and put up in the internal project web.

Team Meetings

The project team will meet at the "sprints" which take place on a six week cycle (see below). During the sprints, there will be time allotted to discuss and evaluate the project process, track progress, discuss resource allocation, new teammembers. The project manager is responsible for the invite and agenda as well as managing the meetings. Agenda and discussions/decisions on these meeting will be documented and put up in the internal project web.

Project review workshops ("learning loops")

Every six months, as preparation for the Management Board meetings and project reviews from the EU project office, the project management team invites the team to an evaluation workshop, lasting for a day, in which product as well as process is being reviewed. Riskassessment is also an important part of this workshop. This meeting could result in proposed changes that will then be reported to the Management Board for decision. The project manager is responsible for the invite and agenda as well as managing the meetings. Agenda and discussions/decisions on these meeting will be documented and put up in the internal project web.

"Sprint" Meetings are the key to PyPy's technical development

Key to PyPy's technical development and research are so called "sprints". These publically announced one-week meetings serve as an intense working forum to rapidly discuss and implement key PyPy ideas with agile methodologies. Developers usually pair up and write unit-tests to test the to-be-implemented features before actually adding them. The unittest-first approach helps to understand the planned feature. Additionally, the discussion in a pair makes sure that obviously wrong pathes of development are avoided. If something seems too hard to test or to pin down explicetly this is taken as an indication of an underlying design problem.

Note that more traditional approaches usually follow a model where developers work alone and only meet to talk. Instead with sprint-driven development talking and actually implementing resulting ideas ensures a more focused approach with fast feedback cycles. While the free software community is successful especially because of it's open communication model sprints are an accelerator to this process. While coding in pairs developers educate each other which leads to a broader common understanding of the project. During a sprint multiple pairs want to work in parallel which adds pressure on design decisions so that independent development of components of the system is possible. Thus sprints not only deepen the communication and understanding among researchers and developers but they imply a working process which enhances the software design in multiple ways. The project manager is responsible for the invite (stated goal) and agenda as well as processmanagement during the sprints. Agenda and discussions/decisions on these sprints will be documented and put up in the internal project web.

With a very-high-level-language like Python rapid development in coding-sprints becomes especially effective. A VHLL-language generally allows to focus on ideas rather than on low-level language details. In combintation with pervasive test-driven development this eases

high-quality rapid evolution towards the intended goals. Obviously, the PyPy developers are very experienced with Python and bigger applications in general. Thus the full potential of agile methodologies is unveiled during PyPy sprints. In less than five weeks worth of development (during four sprints) the group produced a working prototype which is a big success not only in the eyes of its developers.

Technical decisions

Major design or technical decisions are usually reached through consensus during the sprints. If a conflict cannot be resolved there then the technical board gets the final say. The members of the technical board are appointed by a vote of everyone who has commit rights to the source repository. However, it is expected that design and implementation choices will usually be determined by consensual agreement or by informal votes on the development mailing list. This is common practice within the Python and many others free software communities. Also, the PyPy developers and researchers will construct few if any formal hierarchies between them. Constantly working together with agile methodologies and the visibility of each individual contribution help enforce high-quality program code and good design decisions.

B 5.5 Quality control of technical development

The PyPy project will ensure quality by a variety of means. On the grand scale, the involvement of excellent researchers ensures that the general direction takes care of latest insights in language research. Moreover, we will publish our research results on conferences and to scientific and free software communities. This forms the basis to maintain a high-quality general technical direction.

The developers deploy agile methodologies like unittest-driven development and pair-programming. By the end of the project we expect to have produced more than 3000 unittests testing every aspect of the runtime system. The presence of such tests also allows to rapidly change parts of the implementation without fear of breaking functionality elsewhere. We also plan to release our runtime system often and thus gather additional feedback from early adopters, developers and researchers.

To support the open development we base all of our documents, source code and website information on a version control system. In combination with a notification on all changes this ensures that all interested parties can review and react to developments.

The PyPy developers have produced a working prototype within four one-week sprints and a little development in between. The code and design quality of the project is already widely accepted. There are now 400 unittests. As a consequence, Guido van Rossum, the inventor and maintainer of today's Python, listed it as the number one project he would like to succeed. He previously attended one of our sprints and got deeply involved with our architecture and source code which he immediately found intuitive to work with. Thus we believe that our choices for technical quality management are fit to meet highest standards.

Additional Quality procedures

The project manager will circulate a draft Quality Management plan for the project prior to first Project Meeting and then present it for approval at the first Meeting. It should complement the prescribed quality approach with respect to the following aspects:

- ⑩ Document procedures, standards and control
- ⑩ Issue control for documents
- ⑩ Reporting procedures, frequency and format
- ⑩ Communication procedures
- ⑩ Corrective actions
- ⑩ Exception control
- ⑩ Conflict resolution
- ⑩ Meeting draft agenda
- ⑩ Format of meeting minutes
- ⑩ Tracking system for actions
- ⑩ Risk assessment
- ⑩ Evaluation routines
- ⑩ Specific responsibilities within the project

B 5.6 Communication and reporting

The project process will be reported as follows:

- ∞ monthly written status reports to the Management Board/Technical Board by the project management team. These reports will be posted on the internal project web for the entire team to access.
- ∞ project review report to the EU project office. These reports are the result of the project review workshops (every 6th month) and are produced by the project management team. These reports will be posted on the internal project web for the entire team to access.
- ∞ Project evaluation report. At the end of the project, an evaluation report will be produced in which both product, process and deliverables will be evaluated. This report will be presented to stakeholders (consortium companies and partners) and the EU project office.

The technical development of PyPy is driven by open continuous discussion. Many of the involved decisions are made and verified during one-week working meetings, so called "sprints". Members from the larger Python software community are publicly invited and have the chance to interact and work with the PyPy developers or become one themselves. Mailing lists, chat-sessions, Wikis and notification of program changes provide a constant flow of information between PyPy project members and the wider community. Additionally, groups of developers can start interactive "screen" sessions which allows sharing their workspace and implement and communicate efficiently. Therefore conflicts out of missing or conflicting information or due to misunderstandings will be minimized.

Each sprint meeting is planned for by all developers. The sprint goals are usually agreed upon before the meeting starts. This is also important to allow new developers or contributors to join specific efforts. Sprint results are subsequently published to email and web-channels to gather feedback and educate others about changes.

We will present multiple reports and scientific papers on major conferences such as EuroPython (Python's european community conference), OSCON (Open Source Convention), PyCon (python developer conference) and to domain specific audiences such as embedded

device developers. In a later phase of the project the PEP (Python Enhancement Proposals) procedures may be implemented. This is the standard procedure for applying changes to the C-implementation of Python as of today. It forces an author to clearly state the benefits of the proposed Enhancement and provides an rationale. However, such a formal method will only be required when the project reaches the point where users begin to rely on aspects of our implementation.

B 5.7 Consortium – dont write

B 5.8 Ip – dont write