Horus
IMSETY
Software Project Management Plan
Version 0.6 15th May 2007

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Abstract

This is the Software Project Management Plan (SPMP) for the Horus project group, complying with the Software Engineering Standard as set by the European Space Agency [1]. In this document, the estimated time and cost, and the planning of the entire project are provided. In addition, an overview of possible risks that can endanger the delivery of the product within time and as agreed are given. The SPMP is used by the Project Manager (PM) to guide the project and to come to an agreement with Senior Management about budgets and planning. The PM uses the SPMP to organize the project in different phases and to create deadlines. The SPMP is closely related to the Software Quality Assurance Plan (SQAP).
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Chapter 1

Introduction

1.1 Project Overview

In the IMSETY project, a group of eight students at Eindhoven University of Technology (TU/e) work together in a team, called Horus. The objective of this group is to construct a piece of software that will provide scientists and observers with an easy to use interface to conduct experiments on space based samples and possible reference samples on earth.

The objective is to finish this piece of software before the given deadline, which is June 20th, 2007. This needs to be done within the set budget (2576 hours total). Several deliverables are due on earlier dates.

The main deliverables are the User Requirements Document, the Software Requirements Document, the Architectural Design Document, the Detailed Design Document and the software source code itself. The project is split up in several phases, each evolving around the production of one of these documents. Additionally, several management documents will need to be written, maintained and adhered to throughout the project.

1.2 Project Deliverables

Two lists of items that have to be delivered to the customer and the Senior Management, respectively, are given below. Everything will be delivered in electronic form. When applicable, deliverables will also be delivered on paper.

The items that will be delivered to the customer are:

- Software Requirements Document [7] (including the prototype)
- Detailed Design Document [3]
- Software User Manual [9]
- Software Transfer Document [8]
- Unit Test Plan [?]
- Integration Test Plan [?]
- Acceptance Test Plan [?]
- Source code and executable programs
The items that will be delivered to the Senior Management are:

- User Requirements Document
- Software Requirements Document (including the prototype)
- Architectural Design Document
- Detailed Design Document
- Software User Manual
- Software Transfer Document
- Acceptance Test Plan
- Source code and executable programs
- Software Project Management Plan [5]
- Software Quality Assurance Plan [6]
- Software Verification and Validation Plan [10]
- A copy of the entire project repository on compact disc

1.3 Evolution of the SPMP

During the project this document will be extended as a plan is made for each phase. These extensions will be limited to the addition of appendices containing more detailed planning for each phase. During the UR phase, a plan is made for the UR and SR phases. A plan for each subsequent phase is made during the phase that precedes it.

1.4 List of definitions

This section contains the definitions of all specific terms, acronyms and abbreviations in this document.

AD  Architectural Design
ADD  Architectural Design Document
ATP  Acceptance Test Plan
CM  Configuration Manager
DD  Detailed Design
DDD  Detailed Design Document
ECP  External Contact Person
ECTS  European Credit Transfer System
ESA  European Space Agency
ITP  Integration Test Plan
MS  Minutes Secretary
PM  Project Manager
QAM  Quality Assurance Manager
SCMP  Software Configuration Management Plan
SEP  Software Engineering Project
SM  Senior Management
SPMP  Software Project Management Plan
CHAPTER 1. INTRODUCTION

SQAP  Software Quality Assurance Plan
SR    Software Requirements
SRD   Software Requirements Document
STD   Software Transfer Document
SUM   Software User Manual
SVVP  Software Verification and Validation Plan
TR    Transfer
UR    User Requirements
URD   User Requirements Document
UTP   Unit Test Plan
VCM   Vice Configuration Manager
VMS   Vice Minutes Secretary
VPM   Vice Project Manager
VQAM  Vice Quality Assurance Manager

1.5 List of references

Chapter 2

Project Organization

2.1 Process model

The project follows the waterfall model. In this model, every next phase can only begin when all preceding phases have been successfully completed. However, when necessary, we will let some of these phases run in parallel to decrease the delay due to minor problems with the preceding phases. The phases of this project are:

- User Requirements (UR)
- Software Requirements (SR)
- Architectural Design (AD)
- Detailed Design (DD)
- Transfer (TR)

Because the project is in fact a university subject which ends when the product is delivered, the sixth phase of the ESA Software Engineering standard (Operations and Maintenance) is omitted from this project.

2.2 Organizational structure

The TU/e employs the Senior Management and the technical adviser. Communication between Senior Management and the project group is done via the PM. Otherwise, only the VPM can contact the Senior Management directly and only when he is concerned about the functioning of the PM. Whenever the PM is not able to perform his duties for a certain period of time, this is done by the VPM.

The customer is the company ISIS BV, located in Delft. Eddie van Breukelen is our main contact inside ISIS. Contact with the customer is generally initiated by the ECP. The relationship between the actors having some formal influence is shown in figure 2.1.
2.3 Boundaries and interfaces

There are several persons and groups for the project group to interact with. These are:

- **The university**: The Software Engineering Project (SEP) is a project of TU/e. The PM and the QAM are responsible for, respectively, the project progress and its quality, and report to the SM.

- **The technical adviser**: is a staff member of the Computer Science department of TU/e. Team members may consult him on technical issues. The technical adviser is generally invited to a weekly meeting.

- **The customer**: The customer is always contacted by the ECP.

Due to the small scale and duration of the project, no direct relationship with end users and subcontractors can be defined.

2.4 Project responsibilities

This section describes the various roles that we defined for this project. Most roles have been assigned to two people, one student primarily taking up the role and the other doing so if the first is unavailable. As such, the responsibilities of, for example, the Configuration Manager and the Vice Configuration Manager are the same, unless otherwise specified. In general few or no references to "Vice" roles are made in this document, as well as in the other management documents.

2.4.1 Team member

Every student involved in the project except the PM is considered a team member. Team members do everything that is needed for the project to succeed that is not specified elsewhere in this section. In practice, this mostly boils down to writing documents, doing research and writing code.

2.4.2 Project Manager

The Project Manager produces and maintains a project management plan (this document) and leads the project according to that plan to ensure that the product is delivered on time and satisfies the requirements as specified in the URD. His management tasks include but are not limited to:
CHAPTER 2. PROJECT ORGANIZATION

• Motivating team members
• Checking progress
• Managing the time budget and the group process
• Defining work packages and goals
• Providing feedback to the Senior Management through progress reports

2.4.3 Vice Project Manager
The VPM replaces the PM if the PM is unavailable, as specified above. Additionally, the VPM communicates with the Senior Management if he is concerned about the functioning of the PM.

2.4.4 External Contact Person
The ECP maintains primary contact with external groups and individuals. His tasks include:
• Making appointments with the customer and the technical adviser
• Informing the customer and the technical adviser about the current status of the project, where applicable
• Delivering the project documents to the customer

2.4.5 Quality Assurance Manager
The Quality Assurance Manager (QAM) guarantees that the product and all management documents will be delivered as agreed and are of an acceptable degree of quality. This includes:
• Writing the SQAP [6]
• Verifying that procedures and standards as defined in the SQAP and SVVP [10] are being followed
• Checking the consistency of management documents
• Arranging internal and external review sessions
• Monitoring and reviewing all testing activities

2.4.6 Configuration Manager
The Configuration Manager makes sure that the version management of code and documents can be done with ease and in a correct manner. This includes:
• Writing the SCMP [4]
• Creating a central point for data storage
• Making sure that all team members (can) use this data storage as intended
• Maintaining this data storage according to the SCMP

2.4.7 Minutes Secretary
The MS makes minutes of all progress meetings and ensures that the team members and the PM receive these quickly.
Chapter 3

Managerial process

3.1 Objectives and priorities

The management objective is to deliver the product in time and according to set quality standards. The PM and QAM work together to achieve this objective, by respectively monitoring the progress made and the quality of the product during the different stages of development.

3.2 Assumptions, dependencies and constraints

Partly due to the educational nature of the project, it is limited by a rather large number of factors:

- The budget is (8 team members * 11 ECTS * 28 hours) = 2464 working hours
- The PM budget of (4 ECTS * 28 hours) = 112 hours
- The following hard deadlines:
  - Project deadline: June 20th, 2007
  - Intermediate presentation: March 26th, 2007
  - Final presentation: June 18th, 2007
- A holiday week February 19th - 25th and public holidays on April 6th, 9th and 30th, May 17th, 18th and 28th
- Exam periods March 19th - 24th and May 7th - 12th
- Scheduled lectures and homework for classes other than this project - different for every team member

Other than that, the long term success of the project depends for a large part on the efficient evolution of the GENSO project. GENSO is a network that is currently under development, with which our software will communicate. As a result, changes to the GENSO specification in a late stadium might render the software useless. The low availability of GENSO documentation is also a limiting factor. The customer is, however, aware of this danger. As such, care will be taken to come to an agreement with the customer about liability when GENSO related processes turn out different than expected.

3.3 Risk management

During the project, several things can go wrong. The risks that have a high impact and that are most likely to occur will be treated here. Risks can be separated between internal risks, which are
caused by the group itself in one way or another, and external risks, which are caused by outside parties.

3.3.1 Internal Risks

<table>
<thead>
<tr>
<th>Miscommunication</th>
<th>Probability: High</th>
<th>Impact: High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Misinterpretations of what other team members say and write might stand in the way of a common understanding of what to do and how to do it. This might lead to delays, unwanted results and double work.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Prevention:</strong> Throughout the project, and especially during weekly meetings, the PM has to make sure every team member understands the task given to him, by having frequent talks with each group member about their task. Additionally, the QAM verifies that different documents do not conflict with each other.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Correction:</strong> When a problem occurs, the QAM arranges a meeting with all involved people to come to a common understanding of the situation. After this meeting, its results are briefed to all team members.</td>
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<table>
<thead>
<tr>
<th>Too many features in the original design</th>
<th>Probability: Low</th>
<th>Impact: High</th>
</tr>
</thead>
<tbody>
<tr>
<td>The team can be too enthusiastic in the initial documentation of requirements and features, leading to time problems later on.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Prevention:</strong> The technical adviser should inform the team members when he thinks that the amount of work becomes too much.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Correction:</strong> If the amount of work defined in the requirements turns out too large for the project to be completed in time, a conversation with the customer might be started in which we propose to drop certain requirements.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unavailability of team member/PM</th>
<th>Probability: Medium</th>
<th>Impact: Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>A team member or the PM could become unavailable for a period of time, for instance because of illness.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Prevention:</strong> The PM should stay informed of any planned activities such as study trips or holidays of any group member. Additionally, we should all eat enough fruit!</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Correction:</strong> If the group member has a defined role, another group member is appointed who takes over; this will usually be the person being the &quot;Vice&quot; for that role. The substitute will read up on the specific tasks for that role in the corresponding management document (SPMP, SQAP or SCMP).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lack of time</th>
<th>Probability: Medium</th>
<th>Impact: Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>The group may run out of calendar time, not managing to complete the project given the set deadlines.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Prevention:</strong> By spending a large amount of time on the assignment throughout the duration of the project, following the schedule as it is stated in this document, enough time should be available.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Correction:</strong> Requirements with a low priority could be removed from the implementation, as well as additions to the layout of the system.</td>
<td></td>
<td></td>
</tr>
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</table>
3.3.2 External Risks

Absence of customer representative  Probability: Low  Impact: Medium
The customer representative could be unavailable or ill during a certain period of time. Other employees of the company might not be able to adequately take over. 
Prevention: Make enough appointments with the customer to ensure his availability and dedication. 
Correction: In cooperation with the Senior Management, someone else should represent the customer. This person needs to get well informed on the project and its status.

Late changes in requirements  Probability: Medium  Impact: High
The customer might want to change certain requirements after the URD or SRD has been approved. 
Prevention: Inform the customer well of the nature of the waterfall model and the high costs involved with changing a requirement in a later stadium. 
Correction: If the customer insists and the group agrees, the changed requirement will need to be implemented in all previously accepted documents, which will need to be accepted and approved again. The customer might have to agree with a trade-off, cancelling certain other requirements, given the limited budget of the project.

GENSO development stagnates  Probability: Low  Impact: High
Something goes wrong in the design and development of GENSO, causing it to stagnate or rigorously change. 
Prevention: None. 
Correction: In conversation with the customer, either the previous steps of the project will need to be rigorously reviewed and adapted, or the process should be continued as if nothing happened, generating the need for a cleanup/adaptation project after this project has ended.

3.4 Monitoring and controlling mechanisms

Monitoring of progress is done by the PM using the following means:

Weekly Project Group Meetings: These meetings take place in the project room, HG 5.14. Meetings are held Wednesdays at 9 am and are meant to inform each other of the progress made on the various tasks. New tasks are assigned by the PM during these meetings, and a detailed short-term planning is made. Before project group meetings, the PM will read the minutes of relevant previous meetings and compose an agenda for the meeting. Team members can propose additional agenda points before or during the meeting. The PM will chair the meeting.

Progress Meetings: These meetings are scheduled once every two weeks. During these meetings, the PM and QAM meet with the Senior Management. The following things need to be done before a progress meeting:

- A progress report of the last reporting period is written by the PM
- The PM and QAM read the minutes of the previous meeting

A hard copy version of the progress report is delivered to the Senior Management.
3.5 Staffing plan

Roles inside the project are distributed as follows:

Team members are generally expected to be available every working day, when not engaged in work for other classes. Most of the team members will be unavailable on a small amount of these working days and will report this well in advance to the group and the PM. The following team members will be unavailable for a longer period of time:

- Freek van Walderveen: May 4th - 12th, 2007
Chapter 4

Technical process

4.1 Methods, tools and techniques

The methods and tools used during this project are or will be listed in the SRD [7], ADD [2], SVVP [10], SCMP [4] and SQAP [6].

4.2 Software documentation

During the project, documentation should conform to a number of aspects:

Documents must be of good quality: The standards all documents are required to meet are documented in the SCMP in terms of style and in the SQAP in terms of content.

Documents must be reviewed: The manner in which document reviews are performed is described in the SQAP and the SVVP.

The purpose of document reviews is to get them approved: The requirements which apply to the internal approval of documents are given in the SQAP and the SVVP.

4.3 Project support functions

During the project, there are several management functions besides the Project Management, as discussed in section 2.4 of this document. These are:

Configuration Management: The configuration manager controls and organizes the storage of documentation and specifies the way in which different versions should be used and maintained. The CM publishes these regulations in the Software Configuration Management Plan [4].

Verification and Validation: All delivered software products should be tested against their specifications. The QAM is actively involved in writing the Software Verification and Validation Plan [10], where an outline is made of how the group plans to verify and validate these products.

Quality Assurance Management: During the project, all documents should be tested against quality standards; both to conform to the chosen project documentation style and to contain correct information of reasonable quality. The QAM states the regulations and the way in which he plans to check whether these are followed in the Software Quality Assurance Plan [6].
Chapter 5

Work packages, schedule, budget

5.1 Work packages

These will be defined in each of the appendices.

5.2 Dependencies

In the UR and SR phases, there are no dependencies. The SR phase can commence when the UR phase reaches a certain degree of completeness. The prototype should be constructed together with the SR, since it is part of it. To initiate the AD phase, the SR phase should be completed. During the AD phase, when it reaches a high level of completeness, the DD phase could be started since it depends on the information given in the AD.

5.3 Resource requirements

This project relies almost entirely on human resources. Besides the project team, a room for them to work in, some desktop computers to run the software on, access to a printer, telephone, tables and chairs are needed. Additionally, the team members will eat a lot of fruit in order to stay healthy.

5.4 Budget and resource allocation

For each phase in the project, an estimate on the amount of resources needed is noted here. The time invested by the PM and the technical adviser is not included in this table. These values consist of an initial estimation and can change during the course of this project. In the Progress Reports, updates of this estimation will be given.

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<td>300</td>
<td>12%</td>
</tr>
<tr>
<td>SR</td>
<td>450</td>
<td>18%</td>
</tr>
<tr>
<td>AD</td>
<td>500</td>
<td>20%</td>
</tr>
<tr>
<td>DD</td>
<td>900</td>
<td>37%</td>
</tr>
<tr>
<td>TR</td>
<td>150</td>
<td>6%</td>
</tr>
<tr>
<td>Margin</td>
<td>164</td>
<td>7%</td>
</tr>
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<td>Total</td>
<td>2464</td>
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### 5.5 Schedule

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<td>M1</td>
<td>Management documents approved</td>
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<td></td>
<td>M2</td>
<td>URD approved</td>
<td>March 5, 2007</td>
</tr>
<tr>
<td>SR</td>
<td>M3</td>
<td>Prototype approved</td>
<td>March 26, 2007</td>
</tr>
<tr>
<td></td>
<td>M4</td>
<td>SRD approved</td>
<td>April 2, 2007</td>
</tr>
<tr>
<td>AD</td>
<td>M5</td>
<td>ADD approved</td>
<td>April 30, 2007</td>
</tr>
<tr>
<td>DD</td>
<td>M6</td>
<td>DDD approved</td>
<td>May 28, 2007</td>
</tr>
<tr>
<td></td>
<td>M7</td>
<td>Coding complete</td>
<td>May 28, 2007</td>
</tr>
<tr>
<td></td>
<td>M8</td>
<td>Acceptance Test successful</td>
<td>June 18, 2007</td>
</tr>
<tr>
<td></td>
<td>M9</td>
<td>Product handover completed</td>
<td>June 25, 2007</td>
</tr>
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</table>
Appendix A

User Requirements Phase

In the UR phase, the requirements of the user are defined and stated in the URD and the management documents are written.

A.1 Output

At the end of the UR phase, the following documents should be complete:

- URD
- SPMP (including UR and SR appendices)
- SCMP (including UR and SR appendices)
- SQAP (including UR and SR appendices)
- SVVP (including UR and SR appendices)
- ATP (Specific tests are not formulated until the DD phase)

A.2 Work Packages

The work packages for the UR phase are:

- URD
- SPMP
- SCMP
- SQAP
- SVVP
- Project group meetings
- Research

The work packages in this phase are initially divided among the team members as follows:
APPENDIX A. USER REQUIREMENTS PHASE

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<th>Work package</th>
<th>Team members</th>
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<tbody>
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<tr>
<td>SQAP</td>
<td>Jeroen Keiren (QAM)</td>
</tr>
<tr>
<td></td>
<td>Frank Koenders (VQAM)</td>
</tr>
<tr>
<td>SCMP</td>
<td>Freek van Walderveen (CM)</td>
</tr>
<tr>
<td>URD</td>
<td>Carst Tankink</td>
</tr>
<tr>
<td></td>
<td>Freek van Walderveen (CM)</td>
</tr>
<tr>
<td></td>
<td>Joeri de Ruiter (VCM)</td>
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<td></td>
<td>Thijs Nugteren (VPM / ECP)</td>
</tr>
<tr>
<td>Research</td>
<td>Pim Vullers (VMS)</td>
</tr>
<tr>
<td></td>
<td>Stijn Stiefelhagen (MS)</td>
</tr>
<tr>
<td>SVVP</td>
<td>Pim Vullers (VMS)</td>
</tr>
<tr>
<td></td>
<td>Stijn Stiefelhagen (MS)</td>
</tr>
<tr>
<td>Project group meetings</td>
<td>All</td>
</tr>
</tbody>
</table>

### A.3 Budget and resource allocation

<table>
<thead>
<tr>
<th>Work package</th>
<th>Budget estimate (man hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPMP</td>
<td>20</td>
</tr>
<tr>
<td>SQAP</td>
<td>30</td>
</tr>
<tr>
<td>SCMP</td>
<td>20</td>
</tr>
<tr>
<td>SVVP</td>
<td>20</td>
</tr>
<tr>
<td>URD</td>
<td>150</td>
</tr>
<tr>
<td>Research</td>
<td>40</td>
</tr>
<tr>
<td>Project group meetings</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>310</strong></td>
</tr>
</tbody>
</table>
Appendix B

Software Requirements Phase

In the SR phase, the requirements obtained in the UR phase are defined as software requirements and a prototype is made. All management documents are extended with the appendices for the AD phase.

B.1 Output

The input for this phase is the URD. At the end of the SR phase, the following documents should be complete:

- SRD
- SPMP (AD appendix)
- SCMP (AD appendix)
- SQAP (AD appendix)
- SVVP (AD appendix)
- STP (Specific tests are not formulated until the DD phase)

B.2 Work Packages

The work packages for the SR phase are:

- SRD
- Prototype
- SPMP
- SCMP
- SQAP
- SVVP
- Project group meetings
- Research

The work packages in this phase are initially divided among the team members as follows:
## APPENDIX B. SOFTWARE REQUIREMENTS PHASE

<table>
<thead>
<tr>
<th>Work package</th>
<th>Team members</th>
</tr>
</thead>
</table>
| SRD          | Carst Tankink  
               Joeri de Ruiter (VCM)  
               Stijn Stiefelhagen (MS) |
| Prototype    | Thijs Nugteren (VPM / ECP)  
               Freerk van Walderveen (CM)  
               Frank Koenders (VQAM) |
| Research     | Pim Vullers (VMS)  |
| SQAP         | Jeroen Keiren (QAM)  
               Frank Koenders (VQAM) |
| SCMP         | Freerk van Walderveen (CM)  
               Joeri de Ruiter (VCM) |
| SVVP         | Pim Vullers (VMS)  
               Stijn Stiefelhagen (MS) |
| SPMP         | Egbert Teeselink (PM) |
| Project group meetings | All |

## B.3 Budget and resource allocation

<table>
<thead>
<tr>
<th>Work package</th>
<th>Budget estimate (man-hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPMP</td>
<td>15</td>
</tr>
<tr>
<td>SQAP</td>
<td>15</td>
</tr>
<tr>
<td>SCMP</td>
<td>10</td>
</tr>
<tr>
<td>SVVP</td>
<td>30</td>
</tr>
<tr>
<td>SRD</td>
<td>170</td>
</tr>
<tr>
<td>Prototype</td>
<td>80</td>
</tr>
<tr>
<td>Research</td>
<td>100</td>
</tr>
<tr>
<td>Project group meetings</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>450</strong></td>
</tr>
</tbody>
</table>
Appendix C

Architectural Design Phase

The main objectives in the AD phase are the production of the ADD and the functional division of the software into components. All of the management documents are extended in preparation for the DD phase.

C.1 Output

The AD phase takes the SRD as its input. The deliverables for the AD phase are:

- ADD
- SPMP (DD appendix)
- SCMP (DD appendix)
- SQAP (DD appendix)
- SVVP (DD appendix)
- ITP (Specific tests are not formulated until the DD phase)

C.2 Work Packages

The work packages for the AD phase are:

- ADD
- SPMP
- SCMP
- SQAP
- SVVP
- UTP, ITP, STP, ATP (further preparation)
- Project group meetings
- Research

18 SPMP 0.6
The work packages in this phase are initially divided among the team members as follows:

<table>
<thead>
<tr>
<th>Team</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRD/ADD: External protocol</td>
<td>Pim Vullers</td>
</tr>
<tr>
<td></td>
<td>Joeri de Ruiter (VCM)</td>
</tr>
<tr>
<td></td>
<td>Freek van Walderveen (CM)</td>
</tr>
<tr>
<td>ADD: Server design</td>
<td>Thijs Nugteren (VPM / ECP)</td>
</tr>
<tr>
<td></td>
<td>Stijn Stiefelhagen</td>
</tr>
<tr>
<td></td>
<td>Jeroen Keiren (QAM)</td>
</tr>
<tr>
<td>ADD: Client design</td>
<td>Carst Tankink</td>
</tr>
<tr>
<td></td>
<td>Frank Koenders (VQAM)</td>
</tr>
<tr>
<td></td>
<td>Freek van Walderveen (CM)</td>
</tr>
<tr>
<td>SPMP</td>
<td>Egbert Teeselink (PM)</td>
</tr>
<tr>
<td>SQAP</td>
<td>Jeroen Keiren (QAM)</td>
</tr>
<tr>
<td></td>
<td>Frank Koenders (VQAM)</td>
</tr>
<tr>
<td>SCMP</td>
<td>Freek van Walderveen (CM)</td>
</tr>
<tr>
<td>UTP, ITP, STP, ATP, SVVP</td>
<td>Pim Vullers</td>
</tr>
<tr>
<td>Project group meetings</td>
<td>All</td>
</tr>
</tbody>
</table>

Pim Vullers is the only group member allocated to all test plans. This is not because he is expected to do all work for it himself, but because the rest of his team has not been allocated yet, which will be done on the spot.

### C.3 Budget and resource allocation

<table>
<thead>
<tr>
<th>Work package</th>
<th>Budget estimate (man-hours)</th>
</tr>
</thead>
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<td>SPMP</td>
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<tr>
<td>SQAP</td>
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<tr>
<td>SCMP</td>
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<tr>
<td>SVVP</td>
<td>10</td>
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<tr>
<td>ATP, ITP, UTP, STP</td>
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<tr>
<td>ADD</td>
<td>350</td>
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<tr>
<td>Research</td>
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<td>Project group meetings</td>
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</tr>
<tr>
<td>Total</td>
<td>490</td>
</tr>
</tbody>
</table>
Appendix D

Detailed Design Phase

The main objectives in the DD phase are the production of the DDD and the SUM, and programming each functional component of the software.

D.1 Output

The DD phase takes the ADD as its input. The deliverables for the DD phase are:

- DDD
- Source and object code.
- SUM
- SPMP/TR
- SCMP/TR
- SQAP/TR
- ATP

D.2 Work Packages

The work packages for the DDD phase are:

- DDD
- Code
- SUM
- SPMP
- SCMP
- SQAP
- SVVP
- UTP, ITP, STP, ATP (finalising documents, performing actual tests)
- Project group meetings
- Research
Most of the work is not specifically designated to certain team members to allow for flexibility and quickly shifting tasks to whatever is most pressing at any time. The following table lists a few exceptions to this, where the people listed are expected to manage certain work packages, not necessarily do all the actual work:

<table>
<thead>
<tr>
<th>Work Package</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPMP</td>
<td>Egbert Teeselink (PM)</td>
</tr>
<tr>
<td>SQAP</td>
<td>Jeroen Keiren (QAM)</td>
</tr>
<tr>
<td></td>
<td>Frank Koenders (VQAM)</td>
</tr>
<tr>
<td>SCMP</td>
<td>Freerk van Walderveen (CM)</td>
</tr>
<tr>
<td>UTP, ITP, STP, ATP, SVVP</td>
<td>Pim Vullers</td>
</tr>
</tbody>
</table>

### D.3 Budget and resource allocation

<table>
<thead>
<tr>
<th>Work package</th>
<th>Budget estimate (man-hours)</th>
</tr>
</thead>
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<td>SPMP</td>
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<tr>
<td>SQAP</td>
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<td>SCMP</td>
<td>15</td>
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<tr>
<td>SVVP</td>
<td>10</td>
</tr>
<tr>
<td>ATP, ITP, UTP, STP</td>
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<td>DDD</td>
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<tr>
<td>Code</td>
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</tr>
<tr>
<td>Research</td>
<td>15</td>
</tr>
<tr>
<td>Project group meetings</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>915</td>
</tr>
</tbody>
</table>