

2014

Software Project Management Plan

TU/E

OPEN ACCEL

Abstract

This is the Software Project Management Plan (SPMP) for the Open Accel Software Engineering Project. This document is based on the ESA standard for software development. This document provides an overview of the organizational structure and required resources of the project. The SPMP is used to keep track of the planning and to assure that deadlines are met.

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Document Status Sheet

Document status overview

General

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Chapter 1. Introduction

1.1 Project Overview

The project group is one of five project groups for the course called "Software Engineering Project". The group consists of nine students from the Eindhoven University of Technology. The objective of the project is to make a general purpose modeling environment, called OpenACCEL, to be used in the Bachelor Course "Modeling". OpenACCEL will allow students to create models of mainly physical objects.)

Met opmerkingen [EA1]: Include Project Overview

The project deadline is June 27th, 2014. There are several intermediate documents that need to be created. These are described in section 1.2. The budget for the project is 3008 hours.

The first phase of the project consists of doing research and writing the User Requirements Document. After three weeks, we move to the second phase of the project in which we use the agile method of working (extreme programming practices and scrumming) to develop the source code of OpenACCEL. During this phase, documentation is written for the product as well. The main deliverables are the User Requirements Document, the Software Requirements Document, the Architectural Design Document, the Detailed Design Document, the Software User Manual, the Software Transfer Document and the source code. Additionally, some project documents will evolve during different phases of the project.

1.2 Project Deliverables

During the course of the project, several documents have to be produced and delivered to the client and to senior management. All these documents have to be written according to the ESA software engineering standards [1]. All products that will be delivered to the client and senior management are mentioned in the following list:

- User Requirements Document (URD) [14]
- Product Backlog [4]
- Software Requirements Document (SRD) [9]
- Architectural Design Document (ADD) [2]
- Detailed Design Document (DDD) [5]
- Software User Manual (SUM) [12]
- Software Transfer Document (STD) [10]
- Unit Test Plan (UTP) [15]
- System Test Plan (STP) [11]
- Integration Test Plan (ITP) [6]
- Acceptance Test Plan (ATP) [3]
- Software code

The client intends to develop the software further after this project. Therefore the client will receive a copy of all project documents at the end of the project, except for the management documents. All documents have to be delivered both on paper as well as in electronic form.

1.3 Evolution of the SPMP

During the project this document will be updated as a plan is refined during the project. These updates will be limited to the refinement of appendices containing more detailed planning for each phase.

Because each sprint addresses several phases, the Sprints appendix has to be updated during each sprint with more detailed information (if necessary).

1.4 List of definitions

2IP35	The Software Engineering Course
AD	Architectural Design
ADD	Architectural Design Document
AT	Acceptance Test
ATP	Acceptance Test Plan
Client	Kees van Overveld
CM	Configuration Manager
DD	Detailed Design
DDD	Detailed Design Document
ESA	European Space Agency
TU/e	Eindhoven University of Technology
OM	Operations and Maintenance Plan PM
QM	Quality Manager
SCMP	Software Configuration Management Plan
SEP	Software Engineering Project
SL	Software Librarian
SPMP	Software Project Management Plan
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 SVVR
TR	Transfer phase
UR	User Requirements
URD	User Requirements Document
VPM	Vice Project Manager

1.5 List of references

- [1] ESA. ESA Software Engineering Standards. Mar 1995. [2] GROUPNAME. Advanced design document.
- [3] GROUPNAME. Advanced test plan.
- [4] GROUPNAME. Product backlog.
- [5] GROUPNAME. Detailed design document. . [6] GROUPNAME. Integration test plan.
- [7] GROUPNAME. Software configuration management plan.
- [8] GROUPNAME. Software quality assurance plan.
- [9] GROUPNAME. Software requirements document.
- [10] GROUPNAME. Software transfer document.
- [11] GROUPNAME. System test plan.

[12] GROUPNAME. Software user manual.

[13] GROUPNAME. Software validation and verification plan.

[14] GROUPNAME. User requirements document.

[15] GROUPNAME. Unit test plan.

Chapter 2 Project Organization

2.1 Process Model

The project follows the Scrum process model. This model uses a Product Backlog, a prioritized list of high-level requirements written as User Stories. At the start of a sprint, a number of User Stories is selected and put into the Sprint Backlog. These stories are the features that will be implemented during the sprint. For each user story different phases are traversed: requirements, architectural design, implementation and testing. Each sprint has the duration of a week. After the sprints, the product has to be delivered to the customer.

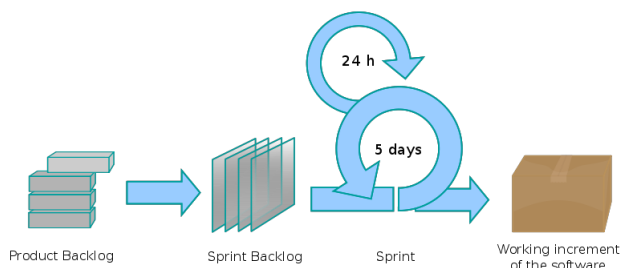
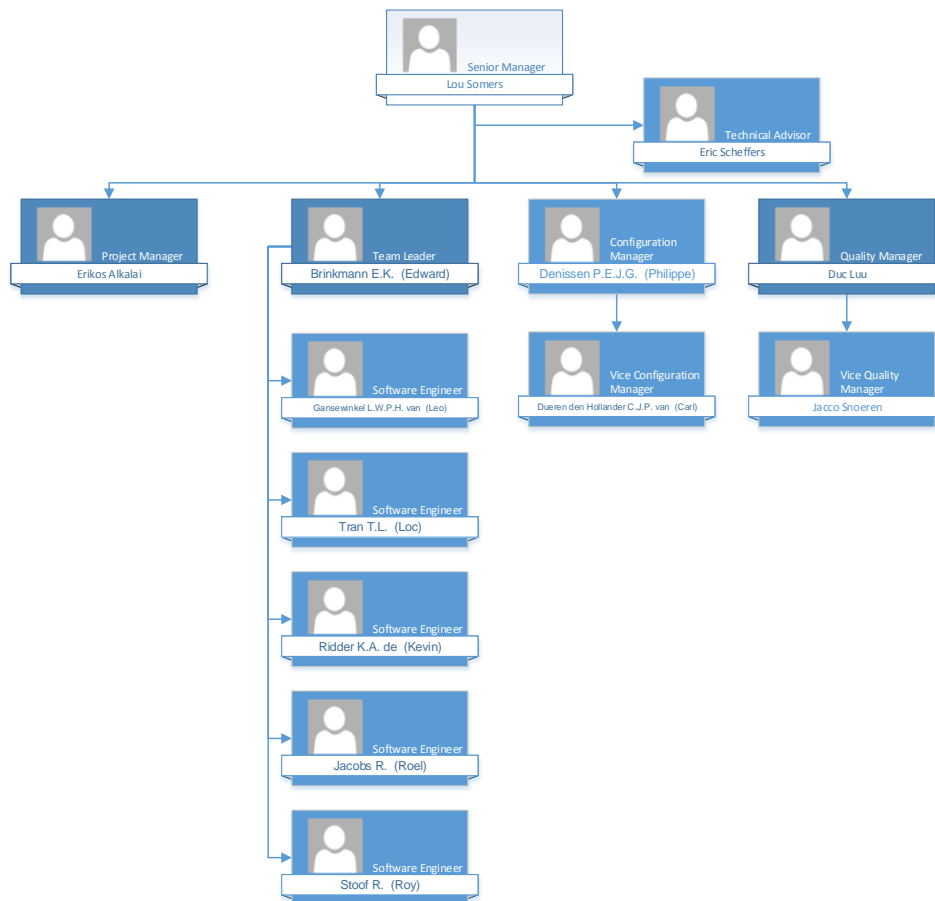


Figure 1 The Scrum process – Image © Lakeworks (http://commons.wikimedia.org/wiki/File:Scrum_process.svg)

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.



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 university is the owner of the software and documents produced in this project
- 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 the weekly meeting.

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

In the project, certain management tasks need to be performed. The risk exists, that a member of the team with a management function, is suddenly unavailable. Therefore every manager will be assisted, and if necessary, replaced by a vice-manager.

2.4.1 Project Manager (PM)

The primary goal of the project manager is to ensure the completion of the project in the available time, within budget. The PM makes the planning and ensures that it is feasible. Whenever problems occur the planning must be adapted in order to obtain a feasible planning again. The PM must ensure the progress of the project. He will be assisted by the vice PM. In case of absence of the PM, the vice PM takes over the PMs Tasks. The tasks the PM must perform are:

- Being the chairman during meetings,
- Motivating team members,
- Forming teams and assigning tasks,
- Checking progress,
- Managing the time budget,
- Defining work packages and goals,
- Providing feedback to the Senior Management through progress reports.

2.4.2 Quality Manager (QM)

The primary goal of the quality manager is to ensure the quality of the end product and the overall process. In case of absence of the QM, the vice QM takes over the QMs tasks. The tasks the QM must perform are:

- Writing the SQAP [8]
- Verifying that procedures and standards which are defined in the SQAP are adhered to
- Checking that all project documents are consistent,
- Arranging internal and external reviews,
- Monitoring and reviewing all testing activities.

2.4.1 Configuration Manager (CM)

The task of the Configuration Manager is to create and maintain the project library. More information about the project library can be found in SCMP[7].

The CMs tasks include but are not limited to:

- Writing the SCMP,
- Creating a repository for all documents and code,
- Checking that the repository is used appropriate (that is according to the SCMP) by all team members,
- Maintaining the repository according to the SCMP

2.4.2 Team Leader

During the project, several teams will exist. A team leader is responsible for the activities of his team. The tasks a team leader must perform are:

- Planning and coordinating team activities,
- Providing feedback about team progress to the PM,
- Motivating team members,

- Chairing internal reviews of the items made by his team.

2.4.3 Development Team Member

The team members are all members of a team including the team leader. The tasks a team member must perform are:

- Assisting the Team Leader or Project Manager by signaling problems in an early stage,
- Executing plans made by the Team Leader and by the Project Manager,
- Keeping track of time spent on various tasks,
- Following procedures and plans.

2.4.4 Scrum Master

The role of the Scrum Master is twofold. He ensures that the Scrum process is followed and used as intended. Furthermore he acts as buffer between the development team and any distracting influences.

Tasks that belong to this role are:

- Ensure that the Scrum process is followed
- Check that the backlog is updated and that stories are clear
- Make sure that sprint items are clear
- Send reminders about demos that are held
- Create the sprint backlog
- Lead the daily scrum and make sure that afterwards everybody knows what to do
- When time is almost up the Scrum master tries to summarize concrete suggestions about what we can do better next sprint

2.4.5 Product Owner

The Product Owner represents the customer. He is accountable for a good product backlog. The tasks of the product owner are:

- Make sure that all requirements asked by the customer are represented by user stories
- Check that the items in the product backlog are user centered rather than technical
- Prioritize items in the product backlog according to the wishes of the customer and the suggestions given by the development team

Chapter 3 Managerial Process

3.1 Objectives and priorities

The management objective is to deliver the product in time and of high quality. The PM and QAM work together to achieve this by respectively checking that progress is made as planned and monitoring the quality of the product at various stages.

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 9 team members * 40 days * 8 hours = 2880
- The Management Team budget is 2 * 40 days * 1.6 hour = 128
- The following hard deadlines, set by senior management:
 - Project deadline: June 27th, 2014
 - Intermediate presentation: May 19th, 2014
 - Final presentation: June 23rd, 2014
- Holidays
 - Liberation day: June 5th, 2014
 - Ascension Day, May 29th – 30th, 2014
 - Pentecost, June 9th, 2014
- Scheduled lectures and homework for classes other than this project are every Monday and Thursday mornings.

3.3 Risk management

Miscommunication

Probability: High

Impact: High

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.

Prevention: 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. It is important that the minutes of the meeting are correct and complete, and they should be read by everyone with care.

Correction: 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.

Too many planned features lead to infeasible design

Probability: High

Impact: high

Prevention: The Technical Advisor should be consulted on whether the delivery of the planned product can be done within the time budget. Every item should have a priority.

Correction: By closely monitoring progress the decision to drop certain requirements can be made in time.

Illness or absence of team members or the PM

Probability: Medium

Impact: High

Prevention: Team members should warn their team leader or the PM timely before a planned period of absence. The PM should make planned absence a point on the first meeting to make sure that absence that is known at that time is taken into account in the schedule.

Correction: Every role has a person to replace him. Communication between these two people is very important. The “vice” person should be actively involved in all work in order to be able to replace his counterpart. All important information and design decision should be in documents or in the meeting notes, to make sure that as little information is lost as possible.

Loss of critical information, documents or code

Probability: Medium

Impact: High

Prevention: The SCMP [7] should be written and used with care. The base assumption should be that there is a backup of every single piece of information at any single time.

Correction: Use the latest backups to recover the most recent version. If the missing parts are necessary, replace these as soon as possible.

The customer changes his mind about the requirements, or there is disagreement about the requirements interpretation.

Probability: High

Impact: Medium

Prevention: It should be made very clear to the customer that after a certain date the requirements can't change anymore

Correction: If the customer changes his mind during the UR phase his new requirements can be incorporated in the URD. Procedures in SQAP [8] detail if the URD may be changed after approval, and (if so) how to implement changes.

The customer is not available when needed

Probability: Medium

Impact: Medium

Prevention: Meetings with the customer should be planned well in advance. The customer has been given room in his schedule for his Software Engineering related work. Holidays and other travel plans of all people involved should be put in this document in section 5.5.3.

Correction: When the customer is not available, meetings may have to be rescheduled.

3.4 Monitoring and controlling mechanisms

The monitoring of progress is done by the PM using the following means:

3.4.1 Daily Scrum

Each day during the sprint a daily scrum is held. Daily scrums take place on 09:15-09:30, and held in front of the task board. The daily scrum is a project status meeting where the task board is updated. Each person describes what he did yesterday and what he will do today. Then he updates the task board by updating his time estimates, adding new post-its, and shift post-it to done. The Scrum Master has to make sure that the daily scrum does not exceed 15 minutes. Furthermore he has to ensure that everybody knows what to do this day.

3.4.2 Sprint Planning Session

The sprint planning session is held at the start of each sprint, which is usually every Friday at 13:00, unless it differently requested by the client. The client must be present at the session. First the client has to determine which stories are the most important. Next, the development team plays planning poker and makes time estimates for the most important stories. Then the velocity is determined and the number of story points available for this sprint. The client may shift some stories after the story points are estimated. During the meeting it is determined:

- sprint goal
- velocity of the team
- sprint backlog of the stories that will be included in this sprint
- defined sprint demo date
- defined time and place for the daily scrum

3.4.3 Sprint Demo

At the end of each sprint a demo is held to present the completed stories to the client. The date, time and location of this demo are set in the sprint planning meeting. The demo takes at most 30 minutes.

3.4.4 Sprint Retrospective

After the sprint demo the sprint retrospective is held. During the retrospective the members of the development team reflect on the sprint. Before the meeting starts everybody has to write down items in the categories “keep”, “stop”, and “change”. During the session everybody mentions these items.

3.4.5 Project metrics

Every week, the work done by the members, needs to be administrated. Each team member has to fill in their hours on a web-based log. This log needs to be filled in every Sunday Evening. A week starts at Monday and ends at Sunday. Every entry in a log has to belong to one of the following work packages: SPMP, SVVP, UTP, ITP, STP, ATP, SCMP, SQAP, URD, SRD, Prototype, Research, ADD, DDD, Code, IT, ST, AT, STD, Formal reviews, Meetings or Presentations.

The PM sends an email to the SM every week, containing the hours spend on the different work packages and the hours spend on following categories: Non project related, General project related, Documentation, specification, design, Source code, Testing, verification, consolidation and rework. Further, for every work package, an estimation of remaining hours is added.

3.5 Staffing plan

Name	E-mail	Role
Lou Somers	l.j.a.m.somers@tue.nl	Senior Management
Kees van Overveld	k.van.overveld@wxs.nl	Product Owner
Erik Scheffers	e.t.j.scheffers@TUE.nl	Technical Advisor
Erikos Alkalai	e.alkalai@tue.nl	PM
Duc Luu	m.luu@tue.nl	QM + VPM
Snoeren J.P.H. (Jacco)	j.p.h.snoeren@student.tue.nl	Vice QM
Denissen P.E.J.G. (Philippe)	p.e.j.g.denissen@student.tue.nl	CM
Dueren den Hollander C.J.P. van (Carl)	c.j.p.v.dueren.den.hollander@student.tue.nl	Vice CM
Brinkmann E.K. (Edward)	e.k.brinkmann@student.tue.nl	Team Member

Ridder K.A. de (Kevin)	k.a.d.ridder@student.tue.nl	Team Member
Gansewinkel L.W.P.H. van (Leo)	l.w.p.h.v.gansewinkel@student.tue.nl	Team Member
Tran T.L. (Loc)	t.l.tran@student.tue.nl	Team Member
Jacobs R. (Roel)	r.jacobs@student.tue.nl	Team Member
Stoof R. (Roy)	r.stoof@student.tue.nl	Team Member

Chapter 4 Technical Process

4.1 Methods, tools and techniques

The methods, tools and techniques used during the course of the project are listed in the SCMP.

4.2 Software documentation

During the project, documents 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 [7] with respect to style and in SQAP [8] with respect to content.

Documents must be reviewed. The manner in which document reviews are performed is described in the SVVP [13].

The purpose of document reviews is to get docs of high quality. The requirements which apply to the approval of documents are given in the SVVP [13].

4.3 Project support functions

Besides Project Management, three other management functions are present. Below a short description of each of them is given. All these management plans are standard part of the ESA standard [1]. More detailed descriptions can be found there.

Configuration Management. The purpose of software configuration management is to plan, organize, control and co-ordinate the identification, storage and change of software through development and transfer. The Configuration Manager writes the SCMP in which plans are outlined for performing these tasks.

Verification and Validation. Software Verification and Validation activities check the software against its specifications. The Quality Manager writes the SVVP as one of his tasks. In it he outlines how he plans to perform his verification and validation activities.

Quality Assurance. 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 [8].

Chapter 5 Work packages, schedule, budget

5.1 Work packages

The work packages are defined in the appendix detailing their phase.

5.2 Dependencies

There are no dependencies when creating the Product Backlog and the User Requirements Document. The sprints in the sprint phase are dependent on these two documents. The transition phase, when the product is delivered to the customer, is dependent on both the other phases.

5.3 Resource requirements

The most important resources during the project are human resources. An overview of resource utilization during the various project phases is given in Section 5.4.

5.4 Budget and resource allocation

In most projects the only resource is the number of man-hours of the people involved. This is described in the next chapter, schedule.

5.5 Schedule

This section gives a rough planning of resource usage. The only important resource are man-hours.

5.5.1 Deadlines

Topic	Deadline
Management Documents approved	June 27, 2014
URD approved	May 10, 2014
Intermediate presentation	May 19, 2014
Prototype approved	May 11, 2014
SRD approved	June 15, 2014
Peer review	May 19, 2014
ADD approved	June 22, 2014
DDD approved	June 27, 2014
Coding complete	June 20, 2014
Acceptance test successful	June 26, 2014
Final presentation	June 23, 2014
Project deadline	June 27, 2014

Met opmerkingen [EA2]: Include the dates

5.5.2 Hour planning

In every sprint the customer pick up the stories to be developed and prioritized them. Then the team is estimating the hours to be spent. The total hours to be spent for this sprint is called the velocity of the sprint. After the first sprint we can safely estimate if the velocity of the next sprint is feasible or not.

5.5.3 Unavailability overview

In the following table we will list which of the group members will be unavailable for some period of time, outside exam weeks and holidays

Name	Role	Unavailable Period
All	Various	Mondays 8:45 - 12:30 and Thursdays 8:45 - 12:30

Met opmerkingen [EA3]: Include unavailabilities

Appendix A – User Requirements Phase

In the UR phase the main focus is on the definition of the user requirements and user stories. Besides the URD, the management documents and Product Backlog are written during the UR phase.

A.1 Output UR Phase

The UR phase can be called the problem definition phase. User requirements are documented in the URD, giving the customers view of the problem. The main outputs of the UR phase are the:

- URD
- SPMP/Sprints phase (SR)
- SCMP/Sprints phase (SR)
- SQAP/UR and SQAP/Sprints phase (SR)
- SVVP/UR and SVVP/Sprints phase (SR)

A.2 Work packages UR phase

The work packages defined for the UR phase are

- URD
- SPMP
- SCMP
- SQAP
- SVVP
- Project Group Meetings
- Research
- Management & initialization

The work package Management & initialization embodies the creation of a document repository, mailing list, etc. as well as management activities, the creation of a document template, etc. SPMP embodies the time spent on reviews. The VPM can also spend hours on this work package when he writes parts of the SPMP. The assignment of teams to various work packages is as follows:

Document	Members
URD	URD team
SPMP	PM
SCMP	CM/VCM
SQAP	QM/VQM
SVVP	Test team
Project Group Meetings	Everyone
Research	Everyone
Management & initialization	PM/QM

Met opmerkingen [EA4]: Fill in the documents and the names

A.3 Budget and resource allocation

The following table lists packages and the budget that has been assigned to each.

Work Package	Budget Estimate (man-hours)
SPMP	70.0
SVVP	45.0
UTP	50.0
ITP	50.0
STP	40.0
ATP	40.0
SCMP	50.0
SQAP	45.0
URD	50.0
SRD	200.0
Prototype	10.0
Research	150.0
ADD	40.0
DDD	40.0
Code	1010.0
SUM	40.0
IT,ST,AT	210.0
STD	40.0
Formal reviews	15.0
Meetings	100.0
Presentations	110.0
Rework	450.0