Software Engineering Group Projects – Project Management Standards

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CONTENTS

1. INTRODUCTION

1.1. Purpose of this Document

This document specifies the major tasks that have to be carried out by the Project Leader with the assistance and advice of the Project Manager.

1.2. Scope

This document specifies organisational roles, identifies major tasks, naming conventions for tasks, project planning including task allocation, milestone and deliverable specification, and management activities.

This document should be read by all project members.

It is assumed the reader is already familiar with the QA Plan [1]. This document also references QA document SE.QA.08, *Operating Procedures and Configuration Management* [2], and readers concerned with Configuration Management should also read that document. Interesting general information on project management is available in [3] and [4].

1.3. Objectives

The objective of this document is to provide a frame of reference for project management activities. It should aid the Project Leader in

- identifying tasks to be executed during the project
- planning those tasks
- ensuring the tasks are monitored and assessed

such that the project is completed successfully (i.e. it is on time, to budget, and meets the client's specified requirements).

2. ORGANISATION

Each project will have a member of Computer Science staff as a *Project Manager*, and a Computer Science student as *Project Leader*. The method of appointment and duties of the Project Leader are described in section 2 of the QA Plan [1].

The quality assurance activities of the project will be overseen by the *Quality Assurance Manager* (QA Manager) who is responsible for adherence to the QA Plan, for writing QA procedures where appropriate, and for conducting reviews and audits of the project tasks and deliverables. The QA Manager will also take minutes at meetings. It is thus the QA Manager's job to make sure that all members of the Project Group are aware of the QA procedures that apply to their tasks, and to ensure that those procedures are carried out.

The Project Leader and the QA Manager roles are the two major supervisory jobs taken by Project Group members. QA Manager is a fairly full-time activity, but the Project Leader may also have time to take on some technical or documentation task.

Various other major activities are carried out by the Project Group, and it is common for one group member to carry out several of these activities. The Project Leader is responsible for allocation of project members to specific activities, including the appointment of the QA Manager.

3. MAJOR ACTIVITIES

The major activities which must be carried out are outlined below, but it should be remembered that other minor activities will occur that are not listed in this document.

Project management – monitoring and directing progress on the project.

Quality assurance - all activities and functions concerned with the attainment of quality; includes the dissemination of QA standards to all group members, writing of extra QA procedures where necessary, conducting reviews.

Spike work – exploratory coding to select and establish the suitability of specific techniques, libraries or other technologies for specific aspects of the product and to develop expertise in their use. These aspects will be the high risk ones from the perspective team members' expertise or of product performance. This will contribute to the design and prepare the team for coding.

Designing the system - working from the provided requirements specification to produce a design specification detailing how the facilities will be implemented. This is likely to involve the implementation of prototype code for specific purposes.

Writing the code - working from the design specification to produce (e.g. Java) source code that matches that design.

Testing the system – the specification and execution of tests designed to demonstrate that the system satisfies the requirements of the customer; this may involve writing test harnesses and the execution of several levels of testing, from unit to module to subsystem to full system testing, ending with acceptance testing carried out in conjunction with the client.

Producing maintenance information - the development of documents (e.g. a maintenance manual) and tools (e.g. shell scripts, makefiles) which will provide instructions or automated facilities regarding how modifications (corrections or enhancements) can be made to the software, and how to rebuild it.

Producing the end-of-project report - the development of a report summarising the activities and final state of the project, identifying the activities carried out by each group member and describing their experiences of the project.

4. PROJECT PLANNING

The Project Leader will produce and maintain a list of project tasks throughout the project. The list will be used to make explicit all the activities of the project, to allocate personnel to activities, to identify milestones and deliverables, and to enable the assessment of the state of progress of the project.

4.1. Task Identification

Every task of the project must be identified and named with a unique identifier. The Project Leader must carry this out as one of the first duties of the management role. Section 3 gives an indication of the major activities to be carried out, which must be subdivided into smaller tasks where appropriate.

The following task identification convention must be used:

SE_groupnumber_taskid_subtaskid

where:

- *groupnumber* is the unique two digit number assigned to the group at the start of the project (e.g. '12' for project group 12);

- *taskid* is an upper case mnemonic uniquely identifying a major task - major tasks will correspond closely to the major activities outlined in section 3 above (e.g. use *PM* for project management, *DS* for design specification, TEST for testing activities);

- *subtaskid* is a two digit number uniquely identifying each subtask of a major task, starting from 01 and using leading zeros when required (e.g. 03 represents the third subtask of a major task). If it is inappropriate to decompose a major task into multiple subtasks, then that task will have a single subtask labelled 01.

A task identifier for writing the test specification, which is the first subtask of the task concerned with testing, for project group 02 might thus be:

SE_02_TEST_01.

The list of project tasks must clearly indicate each task and refer to it by its unique identifier.

4.2. Task Allocation

For each task, one person will be nominated as having primary responsibility for that task. If appropriate, some of the subtasks of that task will be allocated to other group members.

The list of project tasks must indicate the person with primary responsibility for each task and, for each subtask, the persons assigned to that subtask.

4.3. Deliverables

The list of project tasks for all group projects must include production of the documents listed in the *DOCUMENTATION* section of the QA Plan [1] as deliverables. The software and associated tools (e.g. test, build and deployment scripts) should also be included as deliverables. Listings of all software items must be delivered as well as the software itself.

Each deliverable must be given a unique reference on the list of project tasks, which should be the configuration reference allocated according to the procedure detailed in QA document SE.QA.08, Operating Procedures and Configuration Management [2]. This matches the relevant task identifier. For example, the Test Specification might be SE_B_TEST_01.

The software will comprise many individual items (e.g. a collection of package specifications and package bodies plus one or more subprograms). The deliverable references used for the software deliveries will denote a script or batch file which, based on a specified controlled and tagged version will compile, build and deploy the code as appropriate. The appropriate versions of software items should be the versions of the items which comprised the system that passed testing. Use of these files is described in QA document SE.QA.08, Operating Procedures and Configuration Management [2].

5. PROJECT MONITORING

5.1. Weekly Tutorial Meetings

The Project Manager will meet weekly with the group in the tutorial slot in order to:

- monitor progress, and confirm work for the following week;
- detect potential schedule slippage;
- adjust plans associated with later development phases in the light of current circumstances;
- discuss project management techniques.

5.2. Progress Reporting

All team members must keep a time log for their work on the project, on which they note the amount of time they spend on each group project task (in hours). Time spent in the weekly tutorial should not be included in this exercise. The Project Leader must collect information on time expended once per week and produce a summary progress report that can be presented to the Project Manager and the team at the weekly meeting.

The summary progress report must show, for each task, the amount of effort budgeted for that task (in hours), the total amount of effort expended on the task so far, and an estimate of the amount of effort still required to complete the task. The report must also show totals for the whole project under the same three headings.

5.3. Reviews

A review is a formal meeting of relevant group members to scrutinise a deliverable. It is a detailed examination of an item, typically a specification, and is used to decide whether the item is complete. Any problems discovered will be recorded and changes needed will be initiated. A review is intended to `detect but not correct, since its aim is to spot problems, and to note actions or changes that must be carried out subsequent to the review by the authors of the item being reviewed.

The procedures to be followed in conducting reviews are specified in QA document SE.QA.07, Review Standards [5].

The Project Leader should ensure that reviews are conducted at appropriate points in the project.

REFERENCES

[1] QA Document SE.QA.01 - Quality Assurance Plan.

[2] QA Document SE.QA.08 - Operating Procedures and Configuration Management Standards.

[3] F. P. Brooks, The Mythical Man Month, Addison-Wesley, 1975 (in the library and worth a read).

[4] I. Sommerville, Software Engineering, 9th Edition, Addison-Wesley, 2010.

[5] QA Document SE.QA.07 - Review Standards.

[6] QA Document SE.QA.03 - General Documentation Standards.

DOCUMENT HISTORY

Version	*CCF No.*	*Date*	*Changes made to document*	*Changed by*
1.0	N/A	20/09/01	First Word version of document, taken from long used document written by Howard Nicholls.	CJP
1.1	N/A	18/07/02	Simplified for reuse in 2002 after review with Graham Parker. - Minor corrections - Removed walkthroughs	CJP
1.2	Bugnote 5		Removed walkthrough reference left in previous purge.	CJP
1.3	N/A	24/09/03	Attempted to simplify the project plan to a list of tasks.	CJP
1.4	N/A	26/09/04	Updated references	CJP

Version	*CCF No.*	*Date*	*Changes made to document*	*Changed by*
1.5	N/A	12/09/08	Changed document template to be Aber Uni	CJP
1.6	N/A	18/11/09	Changed group letter to be group number to match present situation	CJP
1.7	N/A	09/10/09	Conversion to docbook. Group identification.	NWH
1.8 1.9	N/A N/A	18/09/13 23/09/14	Reverted to word doc. Minor updates. Spike work task identified. Configuration deliverables	BPT NWH