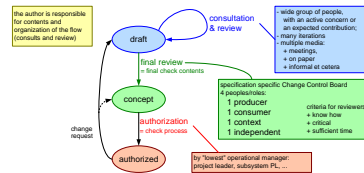# Light Weight Review Process

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Abstract

A light weight review process is described that can be used for documents made during product creation. This review process is focused on improving the contents of specifications as early as possible. The process is light weight to increase the likelihood that it is performed *de facto* instead of *pro forma*.

1 Introduction

The creation of a product is a rather dynamic happening, full of uncertainties and with a lot of time and cost pressure. During the creation many documents are created and updated describing the product and it's design, ranging from product specifications to detailed design and test specifications. Later in the life cycle also a lot of documents are used and maintained, the so-called *Technical Product Documentation* (TPD). The TPD is the final delivery of the product creation process. The TPD is much more stable than the documents used during the creation. The TPD is only changed if there are manufacturing or logistics problems, such as components that are end-of-life, or for safety, security or reliability problems in the field. This document describes the review process for documents in the product creation process.
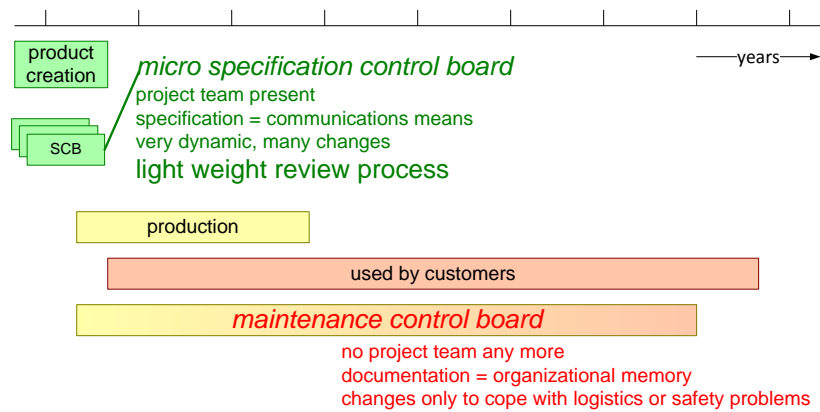

Figure 1: Product Life Cycle and Change Management

Figure 1 shows the product life cycle and the related change management processes. During the product creation phase a project team is active to create the product. This project team will discuss and implement the required changes. In fact product creation is a continuous flow of many changes. The management of these changes is kept as local as possible, by means of *micro* Specification Control Boards (SCB). In the later phases of the life cycle, during production and even after the production has stopped, a maintenance control board (MCB) handles the changes. At this time the project team has disappeared, it's members are active in new product creations.

2 The Review Process

Figure 2 shows the state diagram of the proposed light weight review process. Only three states are present: *Draft*, *Concept* and *Authorized*. The main value of a document is during the *Draft* phase, when many decisions are taken. The document serves during the *Draft* phase as a means for communication. When the document gets more stable a more systematic final review is performed. During the final review the contents of the document is screened by a small group of reviewers. The purpose of the final review is to bring the document in the *Concept* phase, which means that the main stakeholders have a high confidence in the document contents. Finally the process of creating the document is signed off by the responsible operational manager. After sign off the document is *Authorized*. An authorized document can only be changed by a somewhat more heavy change request process. This change request process is a repetition of the same phases with the same players.
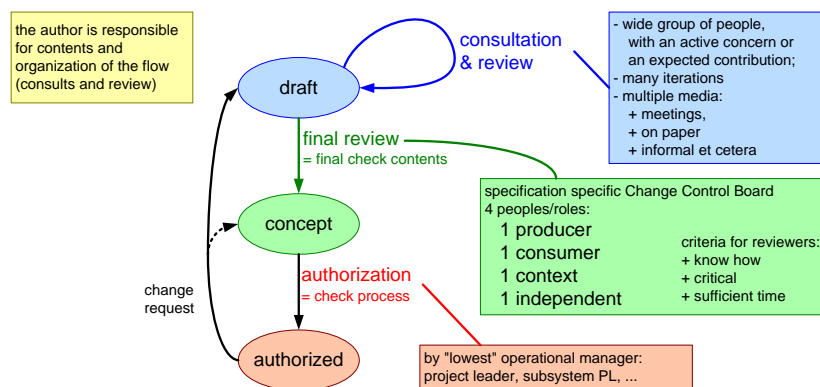

Figure 2: Light Weight Specification Review Process

The author of the document is the owner of this process. It is the author's responsibility to create a document with the right content. The author must involve all concerned stakeholders and must organize the progress of this process. The operational manager is safeguarding the process: capable author, involvement of all relevant stakeholders, progress fitting in the project plan. This safeguarding is formalized by the Authorization, but the project leader will have to coach and monitor the author from the beginning.

In the Subsections 2.1, 2.2, and 2.3 the phase transitions are discussed in more detail.

2.1 Consultation & Review

Many people are involved during the consultation. Everybody with an active concern or who can make a contribution should be involved. Normally many iterations are needed for a converging specification. During the *Draft* phase decisions have to be formulated and can then be discussed by the different stakeholders. This communication can be done in many complementing ways, such as:

- design teams meetings

- specific ad hoc meetings

- bilateral discussions

- paper or electronic exchanges

Recommendations for Consultation & Review:

- Stimulate comments: approach especially those involved people, which have a deviating opinion

- The commentators (the people who are consulted) are the customers of the author; make their life easy:

    - formulate sharp questions, highlight disputes

    - communicate relevant comments to other commentators

    - maintain an accessible history, with the relevant changes

- Process comments professionally, comments can be rejected

- Communicate rejection to the relevant people, especially the originator

2.2 Final Review

The final review is performed by a very small, "micro" specification control board (SCB). The SCB is responsible for the right content of the specification, during the product creation process. The SCB will review the *draft* specification when the contents is sufficiently stable. However, the SCB will also review change requests once the document is authorized. The final review should not be done too early, because than a lot of overhead is created by all the change requests needed to mature the document. The status of the information in the *draft* document should be clear, because most documents are already heavily used during this phase[1].

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[1] Most parts of the system design have mutual dependencies. It is an illusion to assume that specifications can be made in a need sequential way. It is more effective to cope with the mutual dependencies by making the people aware of them and by making the dependencies explicit as much as possible

The size of the SCB is kept small. A small team is clearly accountable. The author or project leader can look all SCB members in their eyes to see if they really did their work. In larger teams a lot of escape room is present: "I thought that my neighbor would read the specification". Input for the final review may come from all involved stakeholders, but the final review itself is performed by this small accountable SCB.

The members of the SCB must be picked with care. First of all, four different roles are recognized and should normally be present:

- producer, someone who will create what is described in the specification (not the author).

- consumer, someone who will use what is described in the specification.

- context guardian, for instance an architect, someone who is responsible for the integrity, consistency and balance of the overall design.

- independent reviewer, for instance a line manager, someone who has not been involved in the project so far and who has an independent view on the specification. This reviewer should detect blind spots.

Second, the members should have the following characteristics:

- have sufficient *know how* of the subject

- be critical

- have sufficient time available to review

These characteristics might sound trivial. However, many people prefer to avoid the load mouthed critics and invite the more silent and polite people. The danger is that real concerns are not discussed, because the too polite reviewer does not want the confrontation with the author. Note that the author does not have to comply with all comments made by critical reviewers. The author may on purpose decide to keep the specification unchanged. The critical reviewer can then escalate such an issue to the project leader, or can decide to leave the issue as is. Also the time criterion sounds trivial, but in many cases project leaders want to be involved in the content discussion as well. While most project leaders are so busy that they are then the sole bottleneck in the review progress.

Some remarks and recommendations for the final review:

- The final review is a systematic check of the contents

- Preferably a meeting of the author with the change control board

- If significant changes are needed, the status stays *draft* an the review has to be repeated later.

- Distribute the document version to be reviewed to all reviewers and collect comments before the final review.

- For the consumer select the most direct or most critical user.

- The role of the Author is:
    - driver of this process

    - entry point for comments and change request

- The role of the Operational manager is:
    - entry point for escalations

    - final responsibility for the outcome (=timing and quality)

2.3 Authorization

The authorization is the task for the responsible operational manager, for instance the project leader. Specifications belong to the deliverables of a project, hence the project leader is responsible for the authorization

The following checklist supports the authorization:

- Has the author the right skills and know how?

- Did the author consult the right people, with the necessary information?

- Is the set of reviewers OK?:

- Is the mix of the SCB OK (producer, consumer, context, independence)?

- Do the members of the SCB have the right characteristics: know how, critical attitude, and sufficient time and opportunity?

2.4 Change Request handling

All documents during product creation are subject to change. Changes made during the draft phase are discussed during the ongoing consultation. However, once the document is reviewed and authorized, the expectations of the stakeholders is that they can build on the specification. If an authorized document is changed than a change request is issued. This change request temporarily causes the document to be in the *draft* phase again. After consultation, is the change accord, the SCB reviews the change also. This whole review cycle can be done with little time and effort: broadcast the change request to the involved stakeholders, and ask for approval by the SCB. The SCB approval can be issued informally, the authorization is the formalization step.

3 Complementary Processes

The *Light Weight Review Process* as described here is relatively informal. This review process can be complemented by more formal techniques, such as *inspections* and *audits*. A good overall balance uses light weight processes where possible, in order to focus the more costly formal approaches for the critical aspects.

Quality assurance departments or external agencies organize audits. In general audits tend to focus on the process, not on the content. Auditors look at the procedures and plans, verify the skills of the involved people, and verify dates and signatures. If the light weight process described above is part of the process description, then auditors will look at the authorization criteria, as described in Subsection 2.3.

Inspections can be organized by the product creation team itself. Inspections are a more systematic and formal way to go through a specification. A good inspection goes in depth and takes time. Inspections are especially suited for critical functions or requirements, such as safety and security. For more extensive reading see the book by Thomas Gilb[1]. Although the title mentions software, the same principles can be applied on systems.

References

[1] Thomas Gilb and Dorothy Graham. *Software Inspection*. Addison-Wesley, 1993.

[2] Gerrit Muller. The system architecture homepage. `http://www.gaudisite.nl/index.html`, 1999.

History
Version: 0, date: March 29, 2004 changed by: Gerrit Muller
- Created, no changelog yet. Based on System Engineering course given at ASML in May 1999.