Quality Management

Introduction to Systems Engineering
I2ISE

Introduction

- What is *Quality Management*?
- Reviews
- Configuration control
- Subversion

What is a Quality Management?

- Quality Management (QM) is a set of activities performed to ensure that quality is
  - Planned
  - Controlled
  - Assured
  - Improved

- A couple of activities/tools: Reviews, version control and Subversion

QM - reviews

- A *review* is the activity of looking through proposed work prior to its' commitment.

- You can (practically) review anything
  - Code, diagrams
  - Documents
  - Processes (e.g. *Scrum retrospective*)
  - …

- For reviews to be effective, they must be *structured*

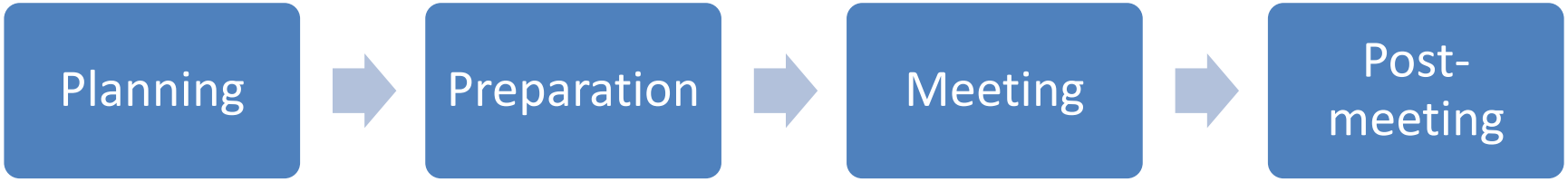
Reviews - goal

- The *goal* of a review: Release of the item under review

- How is the goal *supported* by the review?
  - By *constructive critisism* on the review item
  - By finding potential quality problems
  - By ensuring corrective action is taken

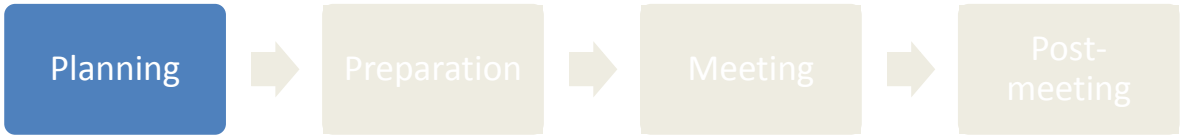
- How is the goal *obstructed* by the review?
  - By using it to prove you're smarter than everybody else
  - By establishing yourself as a leader
  - By pressing your preferred solution

Reviews – phases



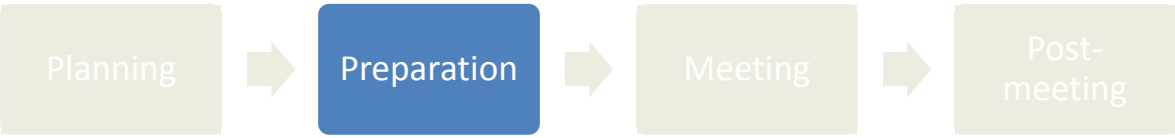
Reviews – planning

- What should be *planned*?
  - *What* are we going to review?
  - Who are the reviewers?
  - *When, where* and *how* will the review take place?
  - How is the document and supplementary material *distributed*?
  - Who will *chair* the review meeting?

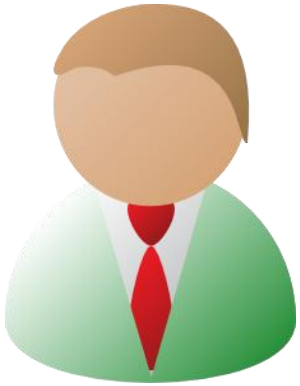


Reviews – preparation (owners)

- How should the *document owners* prepare?
  - Make sure the review item is frozen for review
  - Practicals: Book meeting room, ensure AV equipment is present, …
  - Distribute review item etc. to review opponents along with agenda and venue
  - Define the desired *roles* (review leader, secretary)
  - …
- How should the *reviewer* prepare?
  - Read the review thoroughly – distribute roles (spelling, diagrams, …)
  - Prepare overall and detailed critique
  - Find relevant sources etc.



The document owners' roles



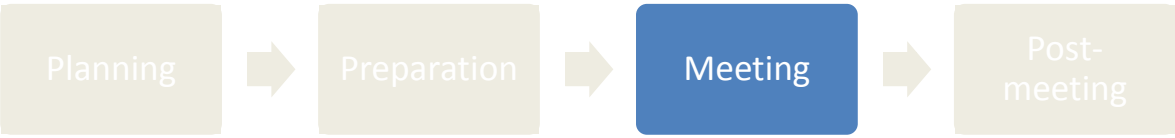
- Review *leader* (chair) ensures…
  - agenda for review is issued and kept
  - everyone is heard during review
  - focus during the meeting
  - delegation of action items

- Review *secretary* ensures
  - distribution of review item, agenda, …
  - creation and distribution of MoM
  - changes are captured
  - review item is updated iaw. review (assigns action items)
  - sufficient coffee!

Planning → **Preparation** → Meeting → Post-meeting

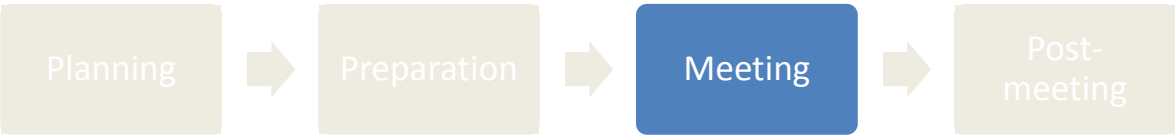
The reviewers' roles

- Some ground rules for the reviewers
  1. Be prepared
  2. Be friendly and empathic
  3. Behave 💬
  4. Point to problems, not solutions
  5. Avoid discussions on style (taste)
  6. Stick to the subject matter



Review: The agenda

- The review meeting is best conducted along an agenda, e.g.
  1. Welcome, opening remarks (*chair*)
  2. General remarks (*opponents*)
  3. Detailed run-through of review item(*opponents*)
  4. Conclusion (*chair, secretary*)
  5. Actions to be taken - rework, corrections (*all*)
  6. Closing remarks (*all*)



Reviews – post-meeting

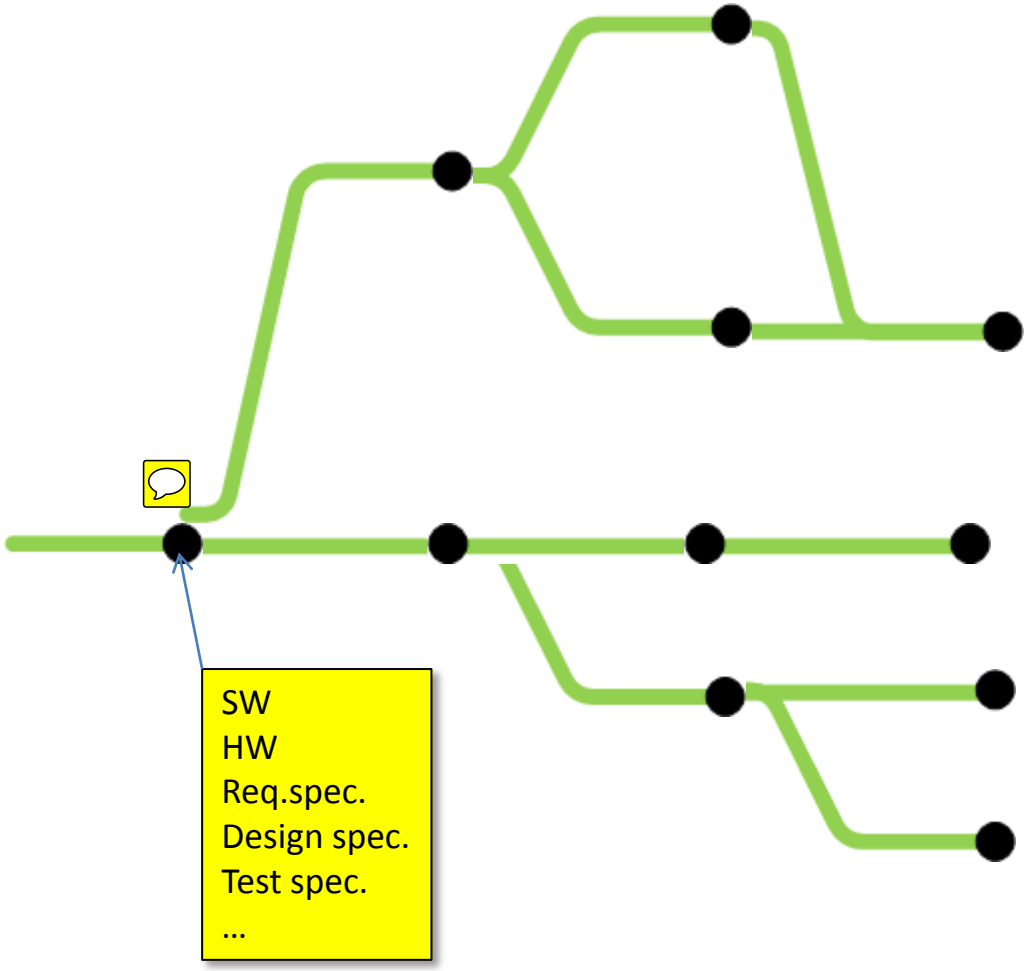
- Make sure Minutes of Meetings are distributed ASAP
- Make necessary corrections to the review item
- Call new review or release the review item

Planning → Preparation → Meeting → **Post-meeting**

Configuration Management

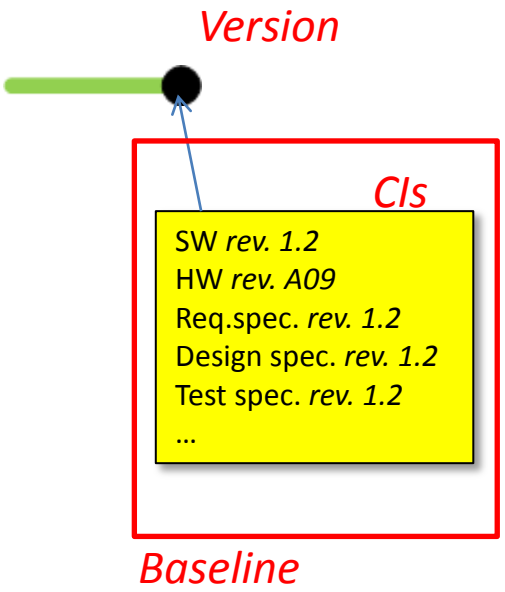
- Another important activity is *Configuration Management*
- The purpose of configuration management is to
  - Capture the *baseline* of a given (version) of a product
  - Ensure that a given product can be re-created from scratch

Configuration Management



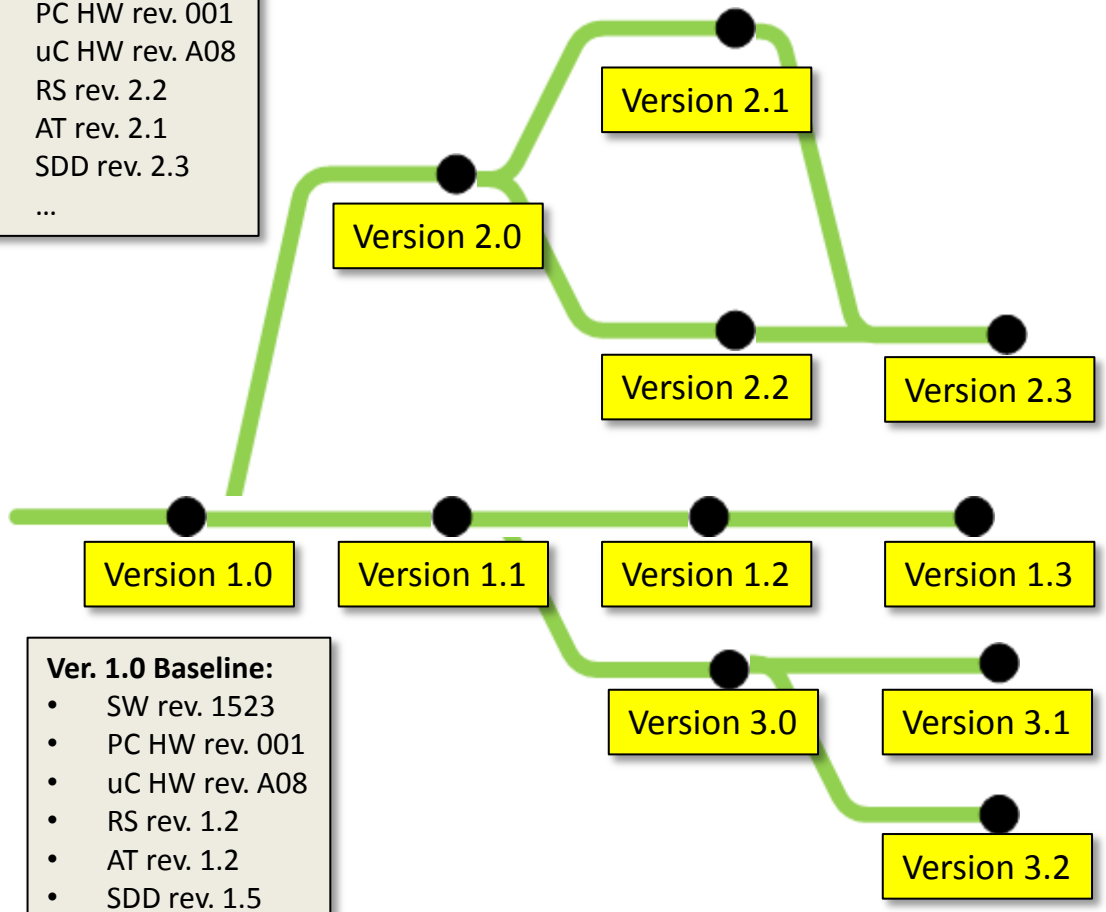
Configuration Management

- What you need is *configuration management*
  - A way to control what *configuration items (CIs)* (documents, HW, SW, tools, …) in what *revision* that go into a given *version* of the product
- Collectively, this is known as a *baseline*
  - Typically defined by a top-level document that calls out the different versions of CIs
- The baseline must contain everything necessary to rebuild the version from scratch



Configuration Management

Ver. 2.0 Baseline:
- SW rev. 2301
- PC HW rev. 001
- uC HW rev. A08
- RS rev. 2.2
- AT rev. 2.1
- SDD rev. 2.3
- …

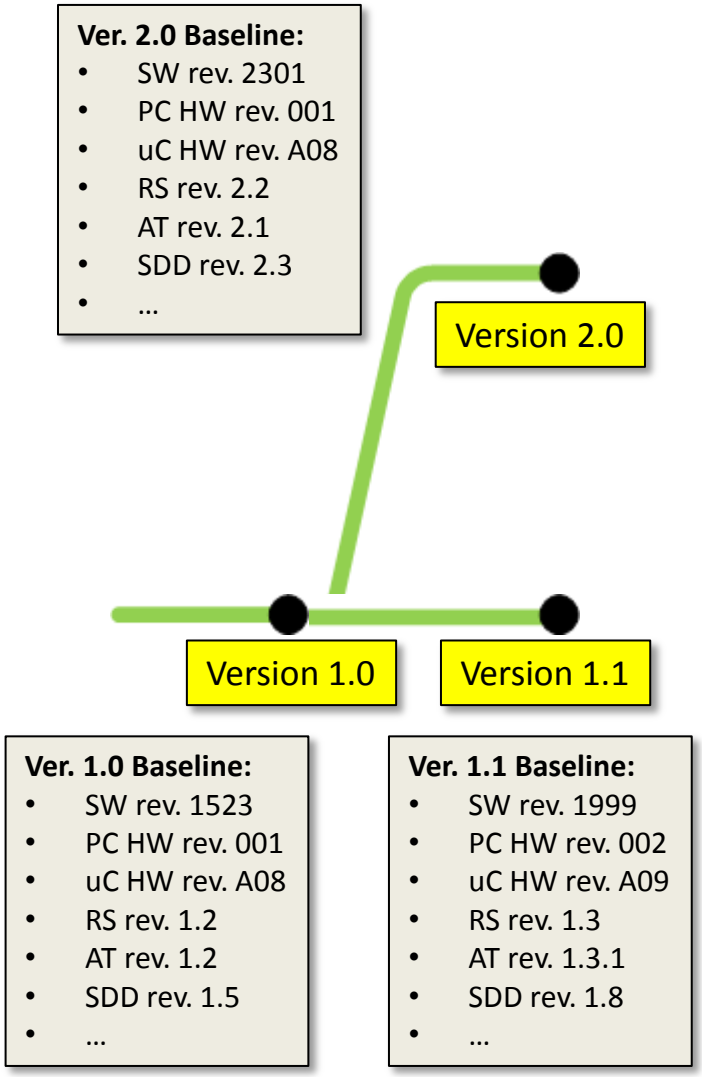


Ver. 1.0 Baseline:
- SW rev. 1523
- PC HW rev. 001
- uC HW rev. A08
- RS rev. 1.2
- AT rev. 1.2
- SDD rev. 1.5
- …

- Versions are defined
- Each *version* defines its own *baseline*

Configuration Management

- Note that…
  - *Versions* are defined at planning-time
  - *Baselines* are defined when a version is completed (released)



CM – version control systems

- There exists a variety of version control systems
  - Systems that allow you to get, update, submit, track and revert revisions of a document/source file
  - Examples: Git, Subversion, PVCS, Dropbox, …

- Indispensable for a number of reasons:
  - Concurrent work
  - Version tracking
  - Reversions to earlier versions

- De facto standard: Subversion (http://subversion.tigris.org/)

CM – Subversion

- *History*: All earlier revisions of a document are maintaied
- *Availability*: Documents are securely accessible in a single place
- *Sharing*: Several people can contribute to a document

CM – Subversion basics

- Somewhere, someone (maybe you?) have created a *repository*
  - Ask Google how if you're interested

- First (and only once), you ***check out*** the repository
  1. Perform an *SVN checkout* operation – this will give you a *working copy* of the repository

- Before you start work, you ***update*** your working copy
  1. Perform an *svn update* operation

- You work on your working copy. When happy, you ***commit*** your changes
  1. Perform an *svn commit* operation on a file or folder

CM – Subversion basics

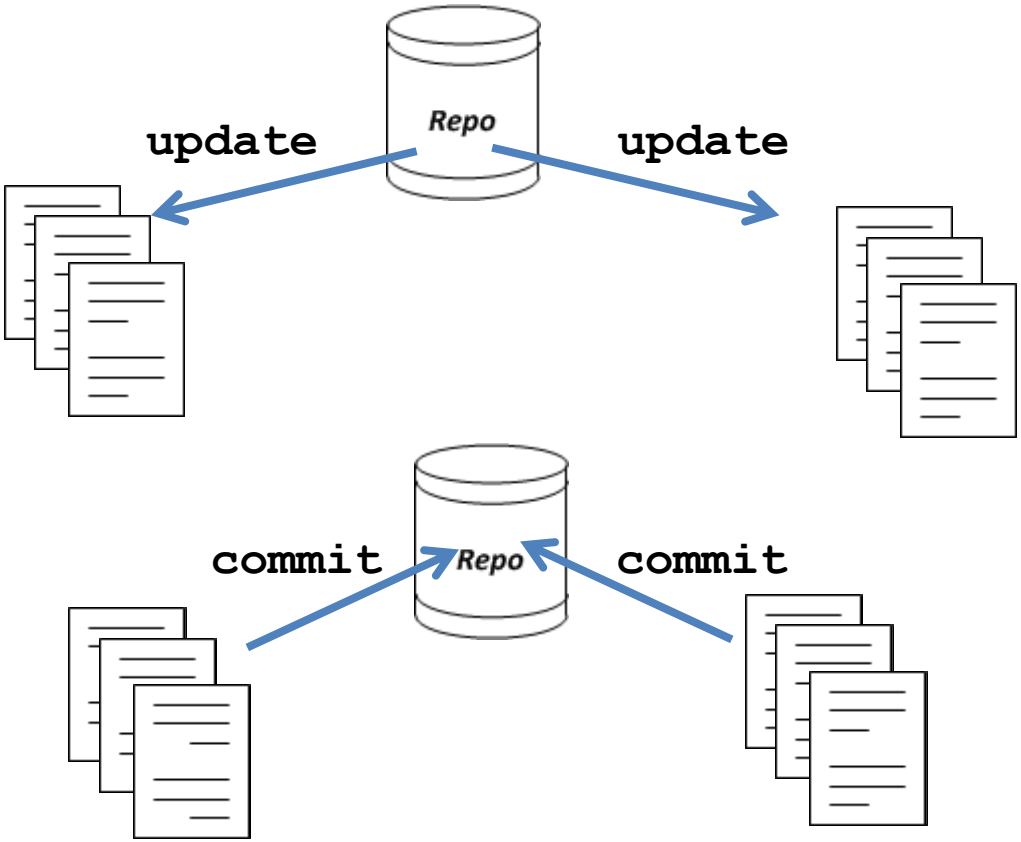
- If you make any new files, you can ***add*** them to the repository
  - Perform an *SVN add* operation
  - Note: Nothing changes until you *commit* your working copy

- If you regret your current changes you can ***revert*** them
  - Perform an SVN revert operation

- Other stuff:
  - Version history
  - Diff
  - Branching
  - Tagging
  - Merging

CM – Subversion: Multiple users

- Multiple users checkout/update ➔ no problem!
- Multiple users commit ➔ *usually* no problem!



CM – Subversion in a test scenario

What else is Subversion good for?
Another war story…

Exercise : Subversion Basics