Software Configuration Management (SCM)

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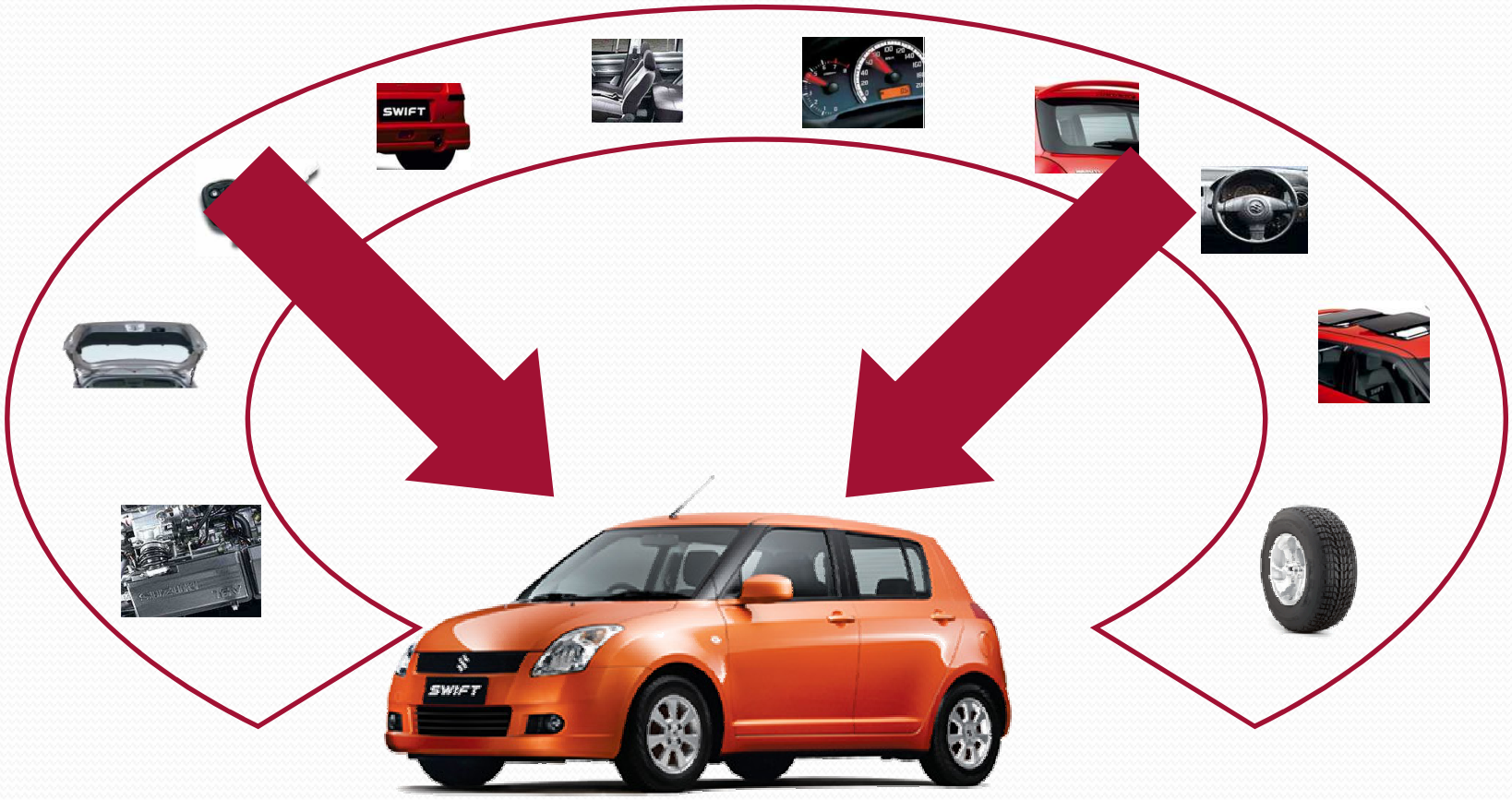
What is a “Configuration”?



Configuration of a Car

What is Software Configuration Management?

- It is about managing the project related items (software, code, checklists, artifacts)
  - Organizing in a structured way
  - Securing only to the privileged users
  - Controlling during modification

Why do we need SCM?

- Some of the frustrating problems we face are
  - The latest version of the source code not found
  - A difficult bug that was fixed at great expense suddenly re-appears
  - A developed and tested feature is mysteriously missing
  - A fully tested program suddenly does not work
  - A wrong version of code was tested

- SCM answers *who*, *what*, *when* and *why*
  - ✓ Who makes the changes?
  - ✓ What changes were made to the system?
  - ✓ When were the changes made?
  - ✓ Why were the changes made?

Why do we need SCM? (cont…)

- Without configuration Management
  - Unorganized project items
  - Confused naming conventions
  - Review / Delivery of wrong version of code
  - Development based on old version of specifications
  - No proper access / privilege control; Unauthorized access to secure information
  - Redundant file creation
  - Change Management becomes ineffective

Elements of SCM

- Configuration identification
  - CI – Configuration Item
  - NCI – Non-Configuration item
- Configuration control (Elements)
  - Library Control
  - Access Control
  - Version Control
  - Establish Naming conventions
  - Establish Baselines
  - Branching, Merging and Labeling
- Change Management

Elements of SCM

- Configurable item (CI)
  - CI is a collection of items, treated as a unit for the purpose of CM, which are likely to undergo change during the project life cycle and a change to them is likely to affect other CIs.
  - Items that needs to be accessed, controlled, secured and archived is a configurable item

  (E.g.) Design document

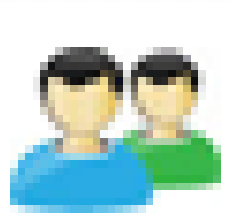
- Non Configurable item (NCI)
  - Any item / file for which changes need NOT be tracked (Version Controlled) i.e. no need to roll back to earlier versions is called a Non-Configured Item.

  (E.g.) Minutes of Meeting(MOM)

Classify the CIs and NCIs - Exercise

- Project Plan
- Schedule Plan
- Review records
- Minutes of Meeting
- Configuration Plan
- Weekly Status Report
- Source Code
- Low Level Design
- Test Report

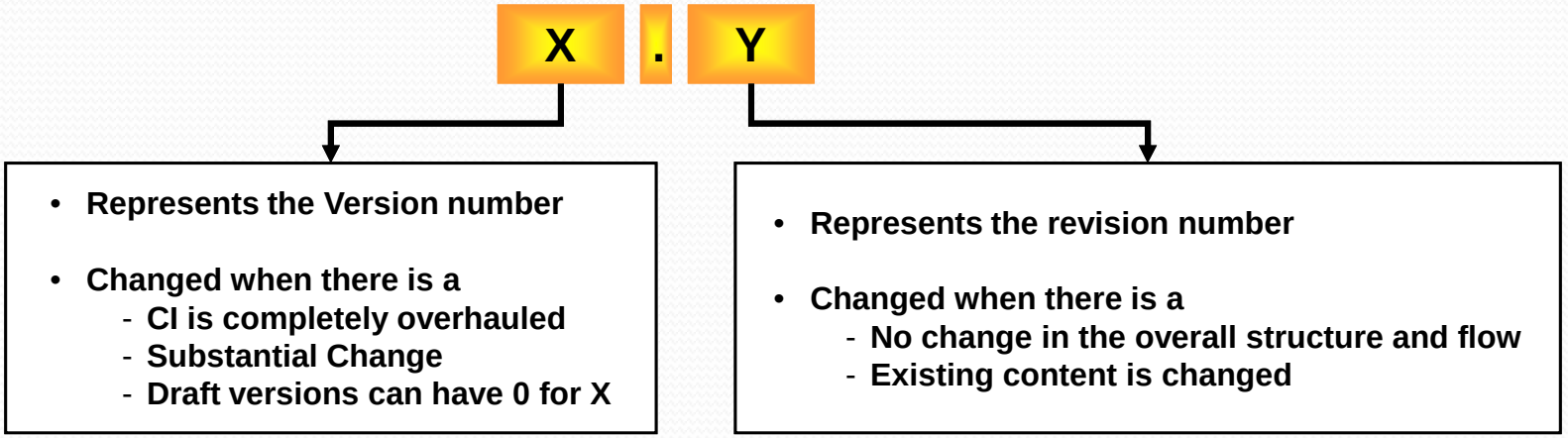
Different Roles and Accesses in SCM



- Administrator
  - all access to all folders.
  - can add users to a project's VSS, and modify their access levels
- Configuration Manager
  - greater access than all team-members.
  - responsible for moving files across projects, establishing baselines, adding requirements files, preparing guidelines, etc
- Team-member
  - varying access depending on their responsibilities. For e.g. PM gets add/modify access to Management project

Version Numbering

- Selecting the right version and latest version is very important, This can be achieved by assigning attributes to the CI names
  - Version number normally represented as X.Y
    - First digit represents the version number, Second digit represents revision number.
    - The first formal release document shall bear the version number 1.0.
  - X will change – When the CI item is completely overhauled, with substantial changes
  - Y will change – Overall structure and flow remain same, existing content is changed.

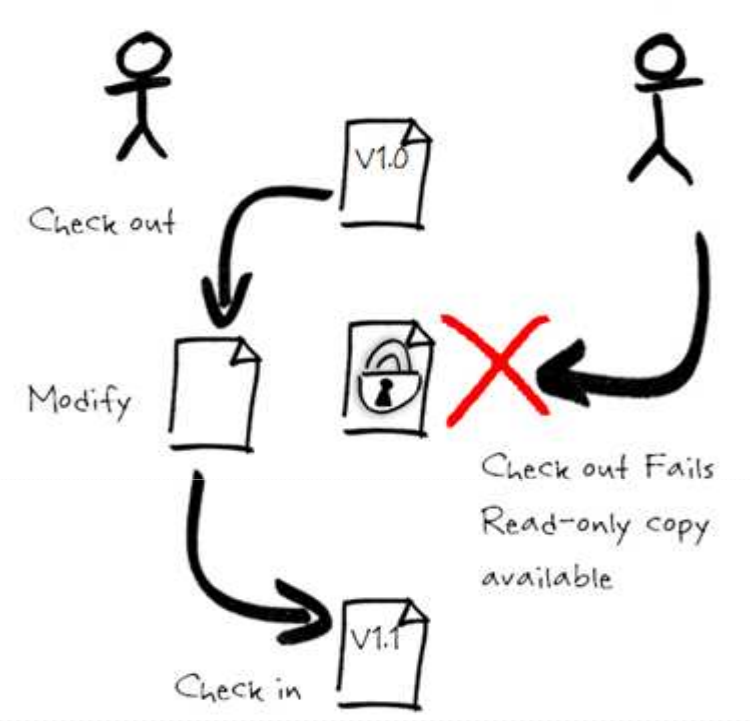


Naming Conventions

- Helps in easy identification
- The name may include
  - Project name/ Application name/ Request ID
  - Document/ Work product name
  - Version number/ Date (If manual configuration)
  - Status – Draft, review, approval etc.,

Sample Document	Sample Naming conventions
Management documents	Est_<Project name>_dd_mm_yy_<ver_ x.y>.doc, PP_<Project name>_<ver_x.y>.doc, SCH_<Project Name>_<ver_x.y>.xls/mpp
Source code	<Component name>_<ver_ x.y>.java, <Module name>_<component name>_<ver_ x.y>.java
Unit Test Plan	UTP_<Component name>_<ver_ x.y>.doc
Quality Records	C-rev_<component name>_<ver_ x.y>**.xls, C-rev_<Module name>_<component name>_<ver_ x.y>**.xls

Check –in and Check -Out



A check-out is the act of creating a local working copy from the repository. A user may specify a specific revision or obtain the latest.

A check - in is the action of writing or merging the changes made in the working copy back to the repository.

SCM Plan

- Identification of configuration and non-configuration items, library structure, baselines, access rights and other details

CM Tools: Version Control

- Visual Source Safe
- SubVersion
- Clearcase
- CM synergy
- SVN


Thankyou