

# **Software Configuration Management**

**By**

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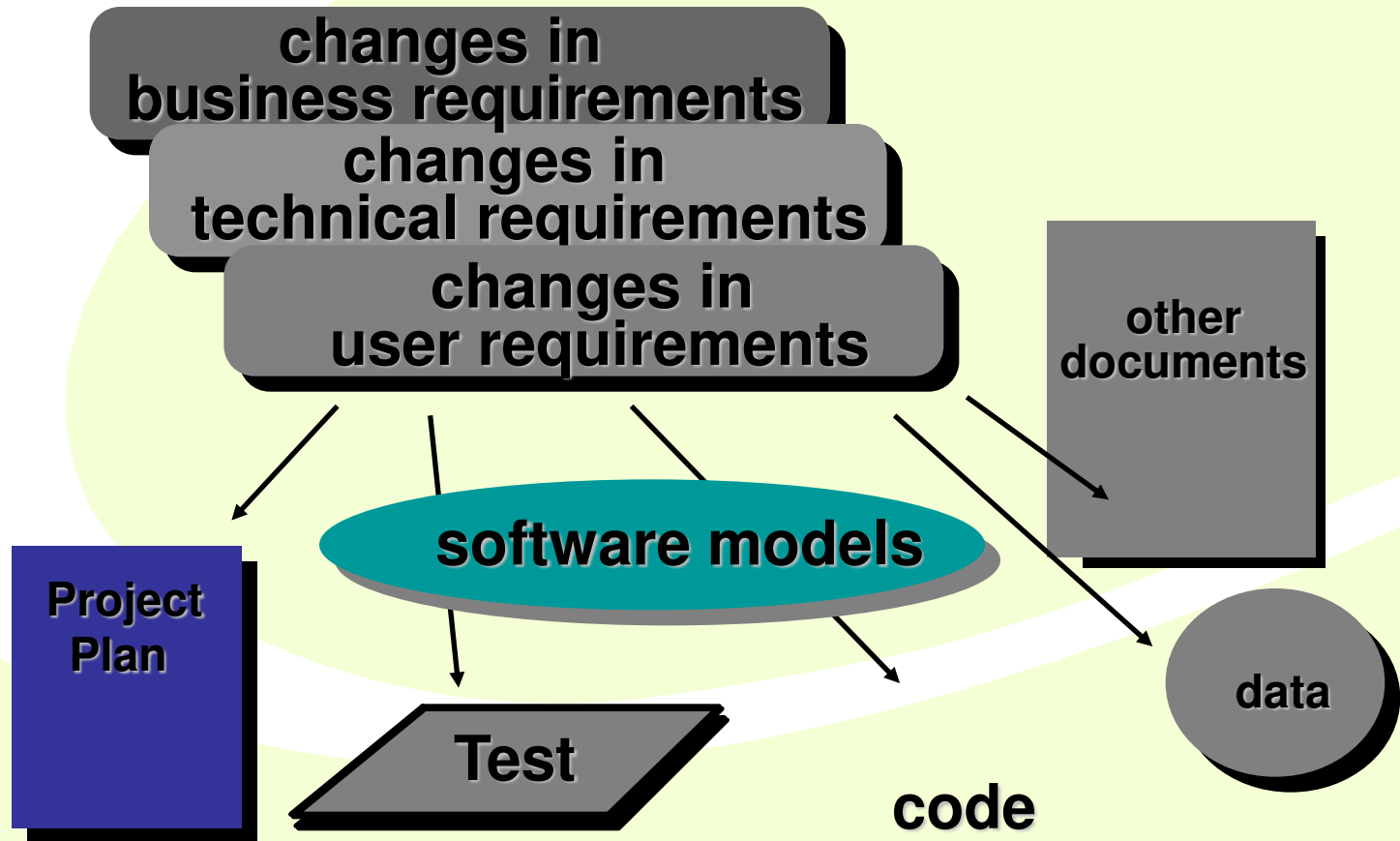
# ***Software Configuration Management***

- **SCM is an umbrella activity i.e. applied throughout the software process, because change can occur at any time.**
- **SCM activities are developed to,**
  - 1. Identify change.**
  - 2. Control change**
  - 3. Ensure that change is being properly implemented, and**
  - 4. Report to others who may have an interest.**

# Fundamental Source of change

- New business or market conditions dictate changes to product requirements or business rules
- New customer needs demand modification of data, functionality, or services
- software engineering team structure
- Budgetary or scheduling constraints cause system to be redefined

# What Are These Changes?



# Software Configuration Items

- It is information i.e. created as part of software engineering process.
- It may be,
  - Computer programs (both source and executable).
  - Documentation (both technical and user).
  - Data (contained within the program or external to it).

# Software Configuration Management

- It is an important element of software quality assurance.
- Its primary responsibility is
  - Identification (tracking multiple versions to enable efficient changes)
  - Version control (control changes before and after release to customer)
  - Change control (authority to approve and prioritize changes)
  - Configuration auditing (ensure changes made properly)
  - Reporting (tell others about changes made)

# Version Control

- Combines procedures and tools to manage the different versions of configuration objects created during the software process.
- Configuration management allows a user to specify alternative configuration of the software system through the selection of appropriate versions.
- The **evolution graph** can be used to describe different versions of a system.
- Each version of the software is a collection of SCIs.

# Change Control Process—I

need for change is recognized

change request from user

developer evaluates

change report is generated

change control authority decides

request is queued for action

change request is denied  
user is informed

change control process—II



# Change Control Process-II



```
graph TD; A[Change Control Process-II] --> B[assign people to SCIs]; B --> C[check-out SCIs]; C --> D[make the change]; D --> E[review/audit the change]; E --> F[establish a "baseline" for testing]; F --> G[change control process—III];
```

**assign people to SCIs**

**check-out SCIs**

**make the change**

**review/audit the change**

**establish a “baseline” for testing**

**change control process—III**

# Change Control Process-III



```
graph TD; A[perform SQA and testing activities] --> B[check-in the changed SCIs]; B --> C[promote SCI for inclusion in next release]; C --> D[rebuild appropriate version]; D --> E[review/audit the change]; E --> F[include all changes in release];
```

**perform SQA and testing activities**

**check-in the changed SCIs**

**promote SCI for inclusion in next release**

**rebuild appropriate version**

**review/audit the change**

**include all changes in release**

# Configuration audit

- **How to ensure change has been properly implemented.**
  - **Formal Technical review**
  - **Software Configuration audit.**
- **The FTR focuses on the technical correctness of the configuration object has been modified.**
- **In FTR, the reviewers assess the SCI to determine consistency with other SCIs, omissions, or potential side effects.**

# Configuration audit (Continue)

- **The audit asks and answers the following questions:**
  - **Has the change specified by the ECO (Engineering change order) been made without modifications?**
  - **Has an FTR been conducted to assess technical correctness?**
  - **Was the software process followed and software engineering standards applied?**
  - **Have the SCM standards for recording and reporting the change been followed?**
  - **Were all related SCI's properly updated?**

# Configuration Status Reporting

**Configuration status reporting (or status accounting) is an SCM task that answers following questions:**

- **What happened?**
- **Who did it?**
- **When did it happen?**
- **What else will be affected by the change?**

# Configuration Status Reporting contd..

- **each time SCL is assigned a new or updated identification , A CSR entry is made.**
- **After CA. results are reported as a part of the CSR task.**