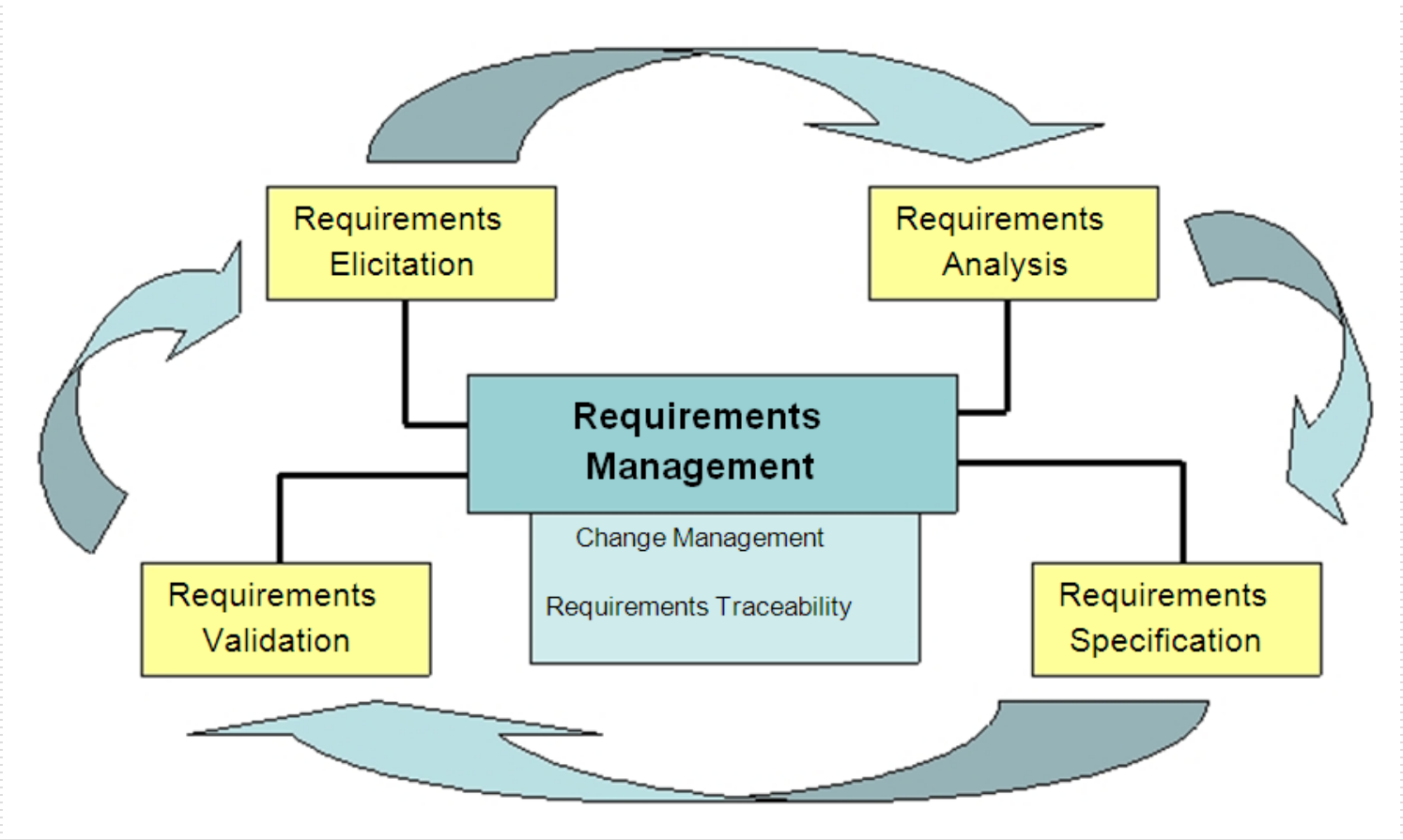
Requirement Engineering **Management**

References: C1.Ebook +John Vu (CMU)

Requirement Management



Change Management

- The process of managing change to the requirements for a system.
- The principal of requirements management:
  - Managing changes to agreed requirements.
  - Managing the relationships between requirements.
  - Managing the dependencies between the requirements document and other documents produced in the development process.

Stable & Volatile Requirements

- Requirements changes may occur while the requirements are being elicited, analyzed and validated and after the system has gone into service.
- Some requirements are subject to more change than others.
  - Stable requirements are concerned with the essence of a system and its application domain.
  - They change more slowly than volatile requirements.
  - Volatile requirements are specific to the instantiation of the system in a particular environment and for a particular customer.

Volatility

- Mutable requirements
  - These are requirements which change because of changes to the environment in which the system is operating.
- Emergent requirements
  - These are requirements that cannot be completely defined when the system is specified but which emerge as the system is designed and implemented.

Volatility

- **Consequential requirements**
  - These are requirements which are based on assumptions of how the system will be used. When the system is put into use, some of these assumptions will be wrong.
- **Compatibility requirements**
  - These are requirements which depend on other equipment or processes.

Activities (10 minutes)

- Indentify:
  - Mutable requirements
  - Emergent requirements
  - Consequential requirements
  - Compatibility requirements
- Build concept map

Change Factor

- Requirements errors, conflicts and inconsistencies:
  - As requirements are analyzed and implemented, errors and inconsistencies emerge and must be corrected.
  - Some of these may be discovered during requirements analysis and validation or later in the development process.
- Evolving stakeholders knowledge of the system:
  - As requirements are developed, customers and end-users develop a better understanding of what they really require from a system.

Change Factor

- Technical, schedule or cost problems:
  - Problems may be encountered when implementing a requirement.
  - It may be too expensive or take too long to implement certain requirements.
- Changing customer priorities:
  - Customer priorities change during system development as a result of a changing business environment, the emergence of new competitors, staff changes, etc.

Change Factor

- Environmental changes:
  - The environment in which the system is to be installed may change, causing the system requirements to change in order to maintain compatibility.
- Organizational changes:
  - The organization which intends to use the system may change its structure and processes, resulting in new system requirements.

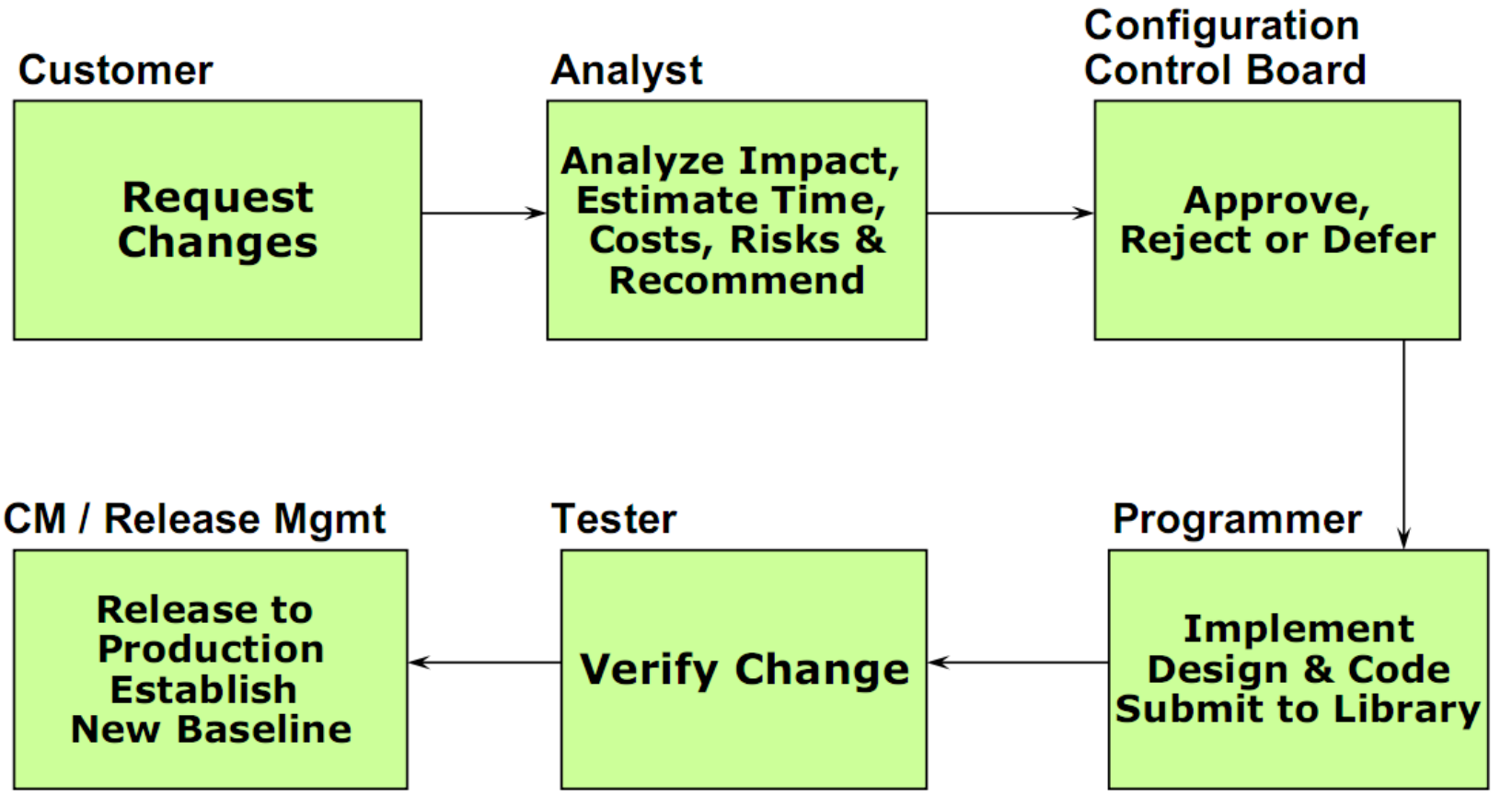
Change Management

- Change management are the procedures, processes and standards which are used to manage changes to requirements.
- Change management consists of:
  - The change request process and the information required to process each change request.
  - The process used to analyze the impact and costs of change and the associated traceability information.
  - The membership of the body which formally considers change requests.
  - The software support (if any) for the change control process.

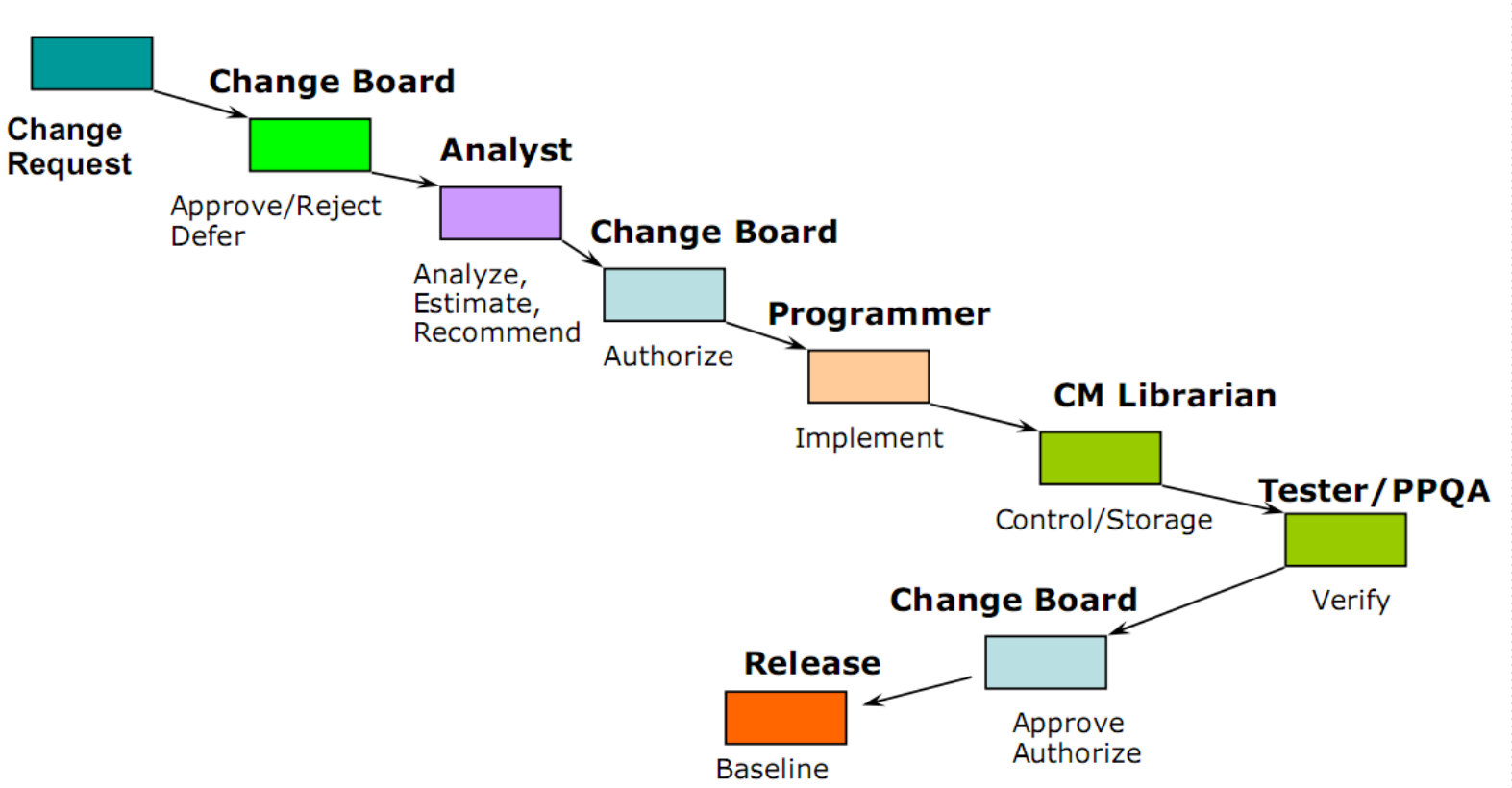
Change Management

- Change Management allows necessary changes to be made while ensuring that change impacts are understood project-wide.
  - Initial work for a product is done without change management.
  - The product is reviewed and baselined.
  - The baselined product is put under configuration management.
  - Further changes are treated systematically.
  - All changes are proposed via Change Board.
  - Analysts review changes, evaluate impact and make recommendations.
  - Change board prioritizes the change requests and accept, reject, or defer the changes.
  - Change board notifies all stakeholders of its decisions

Change Management Flow



Change Management Flow



Change Management Checklist

- Is the change request documented?
- Is the change request analyzed?
- Is the change request authorized?
- Is version control current on the CIs?
- Is the impact to other systems considered because of this change?
- Is there traceability from change request to completed item?

Change Analysis

- The change request is checked for validity.
- Customers can misunderstand requirements and suggest unnecessary changes.
- The requirements which are directly affected by the change are discovered.
- Traceability information is used to find dependent requirements affected by the change.
- The actual changes which must be made to the requirements are proposed.
- The costs of making the changes are estimated.
- Negotiations with customers are held to check if the costs of the proposed changes are acceptable

Change Request Rejection

- If the change request is invalid. This normally arises if a customer has misunderstood something about the requirements and proposed a change which isn't necessary.
- If the change request results in consequential changes which are unacceptable to the user.
- If the cost of implementing the change is too high or takes too long.

Change Processing

- Proposed changes are usually recorded on a change request (CR) form which is then passed to all of the people involved in the analysis of the change.
- Change request forms may include:
  - Proposed change
  - The change analysis
  - Data
  - Responsibility (Who is assigned)
  - Status field (Open/Close)
  - Comments field