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ĐẠI HỌC FPT CẦN THƠ

Chapter 28

Change happens

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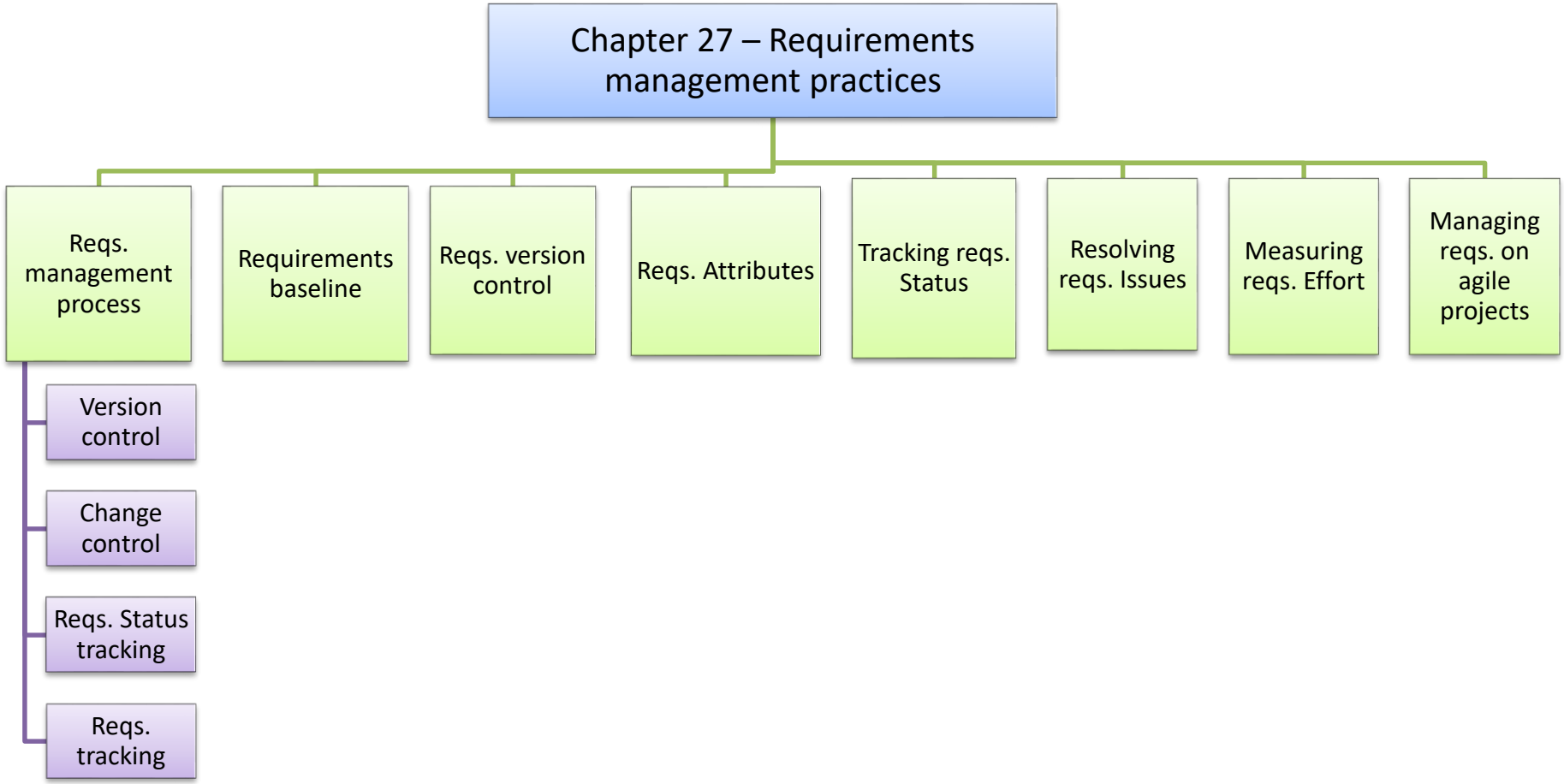
Review chapter 27



Objectives

- Exploring the formal change control practices and how agile projects incorporate changes.
- Student should enhance why we need to manage changes, what they have to do when change happens.

Contents

- Why manage changes?
- Change control policy.
- Basic concepts of the change control process.
- A change control process description.
- The change control board.
- Change control tools.
- Measuring change activity.
- Change impact analysis.
- Change management on agile projects.

Why manage changes?

- Why we manage changes? Because the uncontrolled change is a common source of project chaos, schedule slips, quality problems, and hard feelings. But you remember that *Software change isn't a bad thing; in fact, it's necessary.* An effective software team can nimbly (nhanh nhẹn) respond to necessary changes so that the product they build provides timely customer value.
- An organization that's serious about managing its software projects must ensure that:
  - Proposed requirements changes are thoughtfully evaluated before being committed to.
  - Appropriate individuals make informed business decisions about requested changes.
  - Change activity is made visible to affected stakeholders.
  - Approved changes are communicated to all affected participants.
  - The project incorporates requirements changes in a consistent and effective fashion.

Managing scope creep

- The first step in managing scope creep is to document the business objectives, product vision, project scope, and limitations of the new system.
- Engaging customers in elicitation reduces the number of requirements that are overlooked. Prototyping helps to control scope creep by helping developers and users share a clear understanding of user needs and prospective solutions. Using short development cycles to release a system incrementally provides frequent opportunities for adjustments.
- The most effective technique for controlling scope creep is the ability to say "no". People don't like to say "no," and development teams can receive intense pressure to always say "yes." Philosophies such as "the customer is always right" or "we will achieve total customer satisfaction" are fine in the abstract, but you pay a price for them.
- "Not now" is more palatable than a simple rejection. It holds the promise of including the feature in a subsequent release.

Change control policy

- The following change control policy statements can be helpful:
  - All changes must follow the process. If a change request is not submitted in accordance with this process, it will not be considered.
  - No design or implementation work other than feasibility exploration will be performed on unapproved changes.
  - Simply requesting a change does not guarantee that it will be made. The project's change control board (CCB) will decide which changes to implement.
  - The contents of the change database must be visible to all project stakeholders.
  - Impact analysis must be performed for every change.
  - Every incorporated change must be traceable to an approved change request.
  - The rationale behind every approval or rejection of a change request must be recorded.

Basic concepts of the change control process

- A sensible change control process lets the project's leaders make informed business decisions that will provide the greatest customer and business value while controlling the product's life-cycle cost and the project's schedule.
- The process lets you track the status of all proposed changes, and it helps ensure that suggested changes aren't lost or overlooked. After you've baselined a set of requirements, you should follow this process for all proposed changes to that baseline.

A change control process description

- Figure 28-1 illustrates a template for a change control process description to handle requirements modifications.
- We find it helpful to include the following four components in all process descriptions:
  - Entry criteria, the conditions that must be satisfied before the process execution can begin.
  - The various tasks involved in the process, the project role responsible for each task, and other participants in the task.
  - Steps to verify that the tasks were completed correctly.
  - Exit criteria, the conditions that indicate when the process is successfully completed.

A change control process description

1. Purpose and scope
2. Roles and responsibilities
3. Change request states
4. Entry criteria
5. Tasks
   - 5.1 Evaluate change request
   - 5.2 Make change decision
   - 5.3 Implement the change
   - 5.4 Verify the change
6. Exit criteria
7. Change control status reporting

Appendix: Attributes stored for each request

FIGURE 28-1 Sample template for a change control process description.

A change control process description

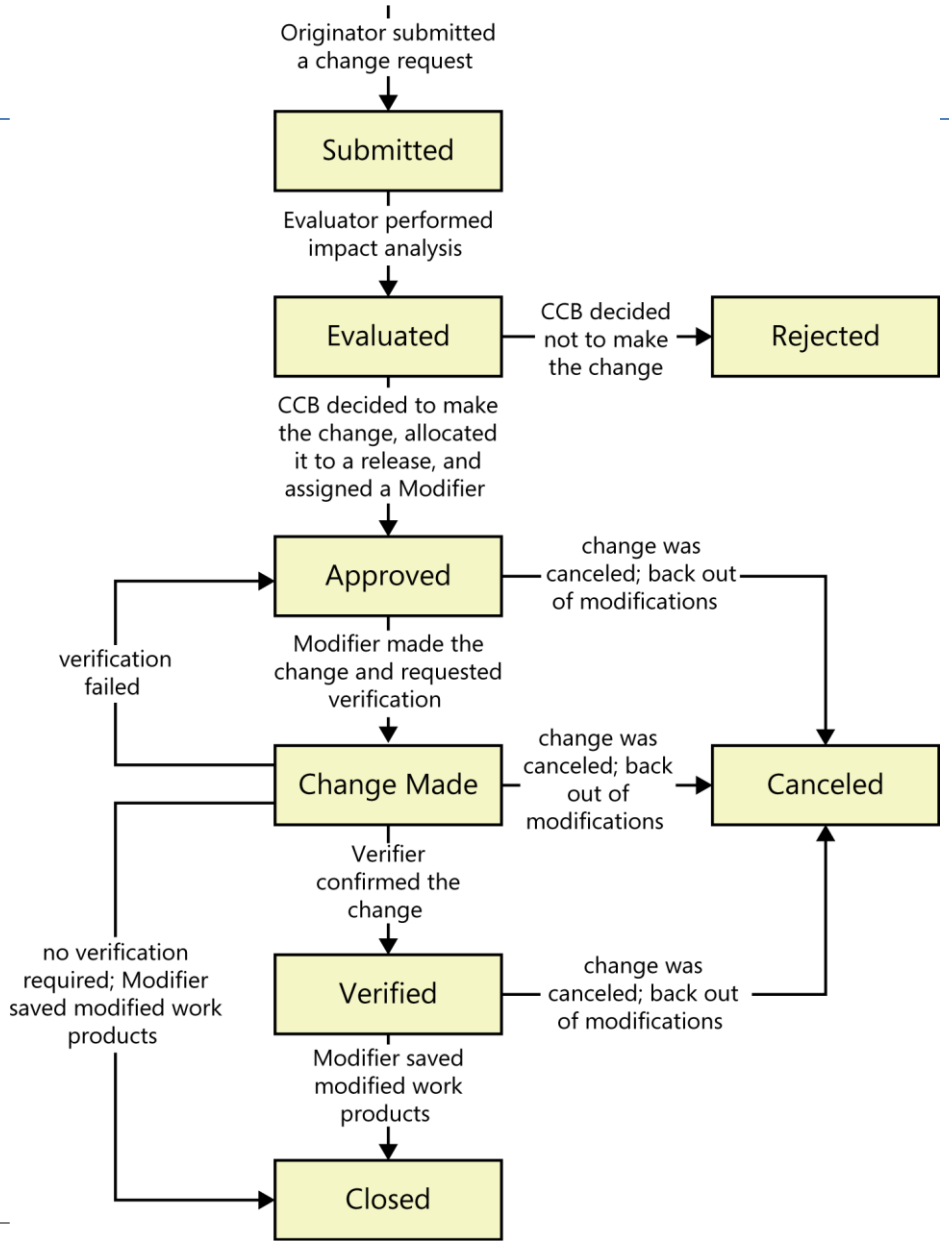
- Purpose and scope:
  - Describe the purpose of this process and the organizational scope to which it applies.
- Roles and responsibilities

TABLE 28-1 Possible project roles in change-management activities

Role	Description and responsibilities
CCB Chair	Chairperson of the change control board; generally has final decision-making authority if the CCB does not reach agreement; identifies the Evaluator and the Modifier for each change request
CCB	The group that decides to approve or reject proposed changes for a specific project
Evaluator	Person whom the CCB Chair asks to analyze the impact of a proposed change
Modifier	Person who is responsible for making changes in a work product in response to an approved change request
Originator	Person who submits a new change request
Request Receiver	Person who initially receives newly submitted change requests
Verifier	Person who determines whether the change was made correctly

A change control process description

- Change request status



A change control process description

- Entry criteria:
  - The basic entry criterion for your change control process is that a change request with all the necessary information has been received through an approved channel.
- Tasks:
  - Evaluate change request: Begin by evaluating the request for technical feasibility, cost, and alignment with the project's business requirements and resource constraints. The CCB Chair might assign an Evaluator to perform impact analysis, risk and hazard analysis, or other assessments.
  - Make change decision: The appropriate decision makers, chartered as the CCB, then decide whether to approve or reject the change. The CCB gives each approved change a priority or target implementation date, or it allocates the change to a specific iteration or release.
  - Implement the change: The assigned Modifier (or Modifiers) updates the affected work products as necessary to fully implement the change.
  - Verify the change: Requirements changes typically are verified through a peer review to ensure that modified deliverables correctly address all aspects of the change.

A change control process description

- Exit criteria: Satisfying the following exit criteria indicates that an execution of your change control process was properly completed:
  - The status of the request is Rejected, Closed, or Canceled.
  - All modified work products are updated and stored in the correct locations.
  - The relevant stakeholders have been notified of the change details and the status of the change request.
- Change control status reporting:
  - Identify the charts and reports you'll use to summarize the contents of the change database. These charts might show the number of change requests in each state as a function of time, or trends in the average time that a change request is unresolved.
  - The project manager uses these reports when tracking the project's status.

The change control board

- The *change control board* is the body of people—whether it is one individual or a diverse group—that decides which proposed changes and new requirements to accept, which to accept with revisions, and which to reject.
- CCB composition: The CCB membership should represent all groups who need to participate in making decisions within the scope of that CCB's authority. Consider selecting representatives from the following areas:
  - Project or program management.
  - Business analysis or product management.
  - Development.
  - Testing or quality assurance.
  - Marketing, the business for which the application is being built, or customer representatives.
  - Technical support or help desk.

The change control board

- CCB charter
  - Each project should create a brief charter that describes its CCB's purpose, scope of authority, membership, operating procedures, and decision-making process (Sorensen 1999).
  - The charter should state the frequency of regularly scheduled CCB meetings and the conditions that trigger a special meeting or decision. The scope of the CCB's authority indicates which decisions it can make and which ones it must escalate.
- Renegotiating commitments:
  - Stakeholders can't stuff (đưa vào) more and more functionality into a project that has schedule, staff, budget, or quality constraints and still expect to succeed.
  - Before accepting a significant requirement change, renegotiate commitments with management and customers to accommodate the change.

Change control tools

- Many teams use commercial issue-tracking tools to collect, store, and manage requirements changes. A report of recently submitted change requests extracted from the tool can serve as the agenda for a CCB meeting.
- To support your change process, look for a tool that:
  - Allows you to define the attributes that constitute a change request.
  - Allows you to implement a change request life cycle with multiple change request statuses.
  - Enforces (bắt tuân thủ) the state-transition model so that only authorized users can make specific status changes.
  - Records the date of each status change and the identity of the person who made it.
  - Provides customizable (tùy chỉnh), automatic email notification when an Originator submits a new request or when a request's status is updated.
  - Produces both standard and custom reports and charts.

Measuring change activity

- Measuring change activity is a way to assess the stability of the requirements. It also reveals opportunities for process improvements that might lead to fewer changes in the future.
- Tracking the following aspects of your requirements change activity:
  - The total number of change requests received, currently open, and closed.
  - The cumulative number of added, deleted, and modified requirements.
  - The number of requests that originated from each change origin.
  - The number of changes received against (đối với) each requirement since it was baselined.
  - The total effort devoted to processing and implementing change requests.

Measuring change activity

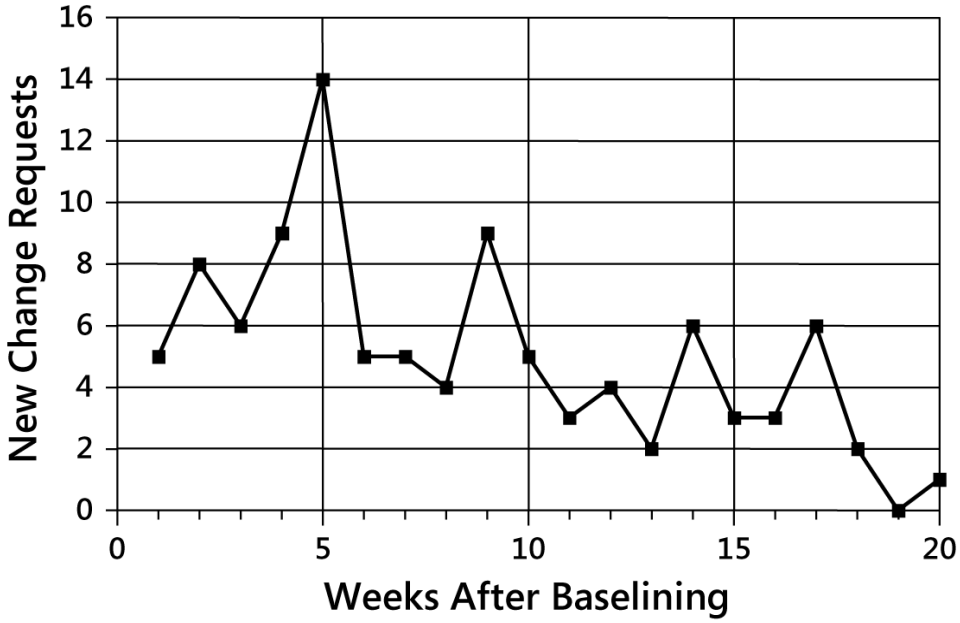


FIGURE 28-3 Sample chart of requirements change activity.

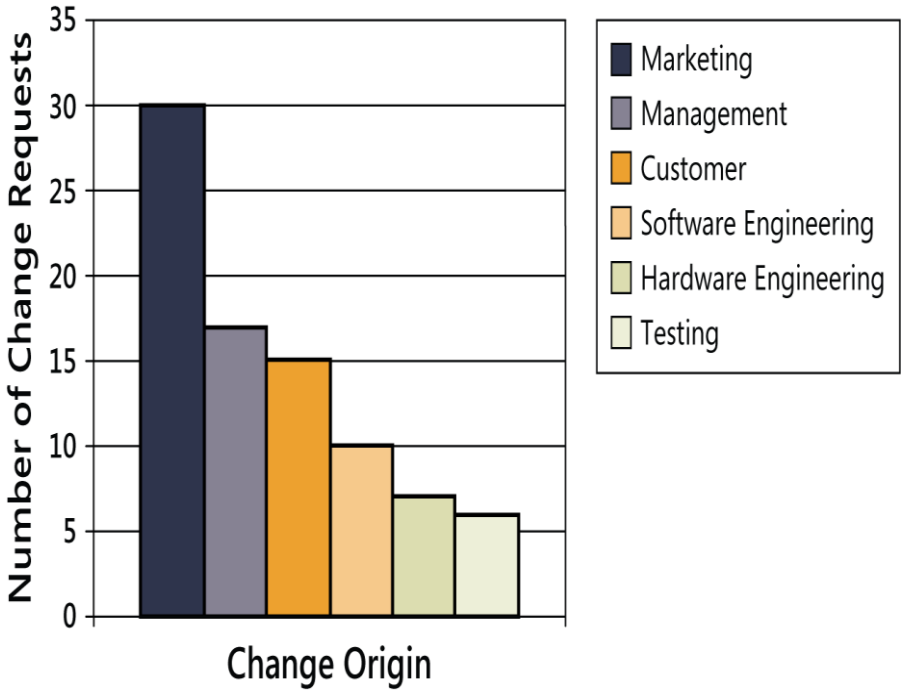


FIGURE 28-4 Sample chart of requirement change origins.

Change impact analysis

- Impact analysis is a key aspect of responsible requirements management. It provides an accurate understanding of the implications of a proposed change, which helps the team make informed business decisions about which proposals to approve.
- The analysis examines the request to identify components that might have to be created, modified, or discarded, and to estimate the effort required to implement the change.
- *Impact analysis procedure:* Impact analysis involves three steps:
  - Understand the possible implications of making the change. Changes can lead to conflicts with other requirements or can compromise quality attributes, such as performance or security.
  - Identify all the requirements, files, models, and documents that might have to be modified if the team incorporates the requested change.
  - Identify the tasks required to implement the change, and estimate the effort needed to complete those tasks.

Change impact analysis

- Impact analysis template: **FIGURE 28-8** Impact analysis template.

Change request ID: _____
Title: _____
Description: _____
_____
Evaluator: _____
Date prepared: _____
Estimated total effort: _____ labor hours
Estimated schedule impact: _____ days
Additional cost impact: _____ dollars
Quality impact: _____
_____
Other components affected: _____
_____
Other tasks affected: _____
Life-cycle cost issues: _____

Change management on agile projects

- Agile projects are specifically structured to respond to—and even welcome—scope changes. One of the 12 principles of agile software development is "Welcome changing requirements, even late in development. Agile processes harness (sử dụng) change for the customer's competitive advantage".
- Agile projects manage change by maintaining a dynamic backlog of work to be done (see Figure 28-9 next slide). "Work" includes user stories yet to be implemented, defects to be corrected, business process changes to be addressed, training to be developed and delivered, and the myriad (vô số) other activities involved with any software project.
- Each iteration implements the set of work items in the backlog that have the highest priority at that time. As stakeholders request new work, it goes into the backlog and is prioritized against the other backlog contents.
- Work that has not yet been allocated can be reprioritized or removed from the backlog at any time. A new, high-priority story could be allocated to the forthcoming iteration, forcing a lower-priority story of about the same size to be deferred to a later iteration.

Change management on agile projects

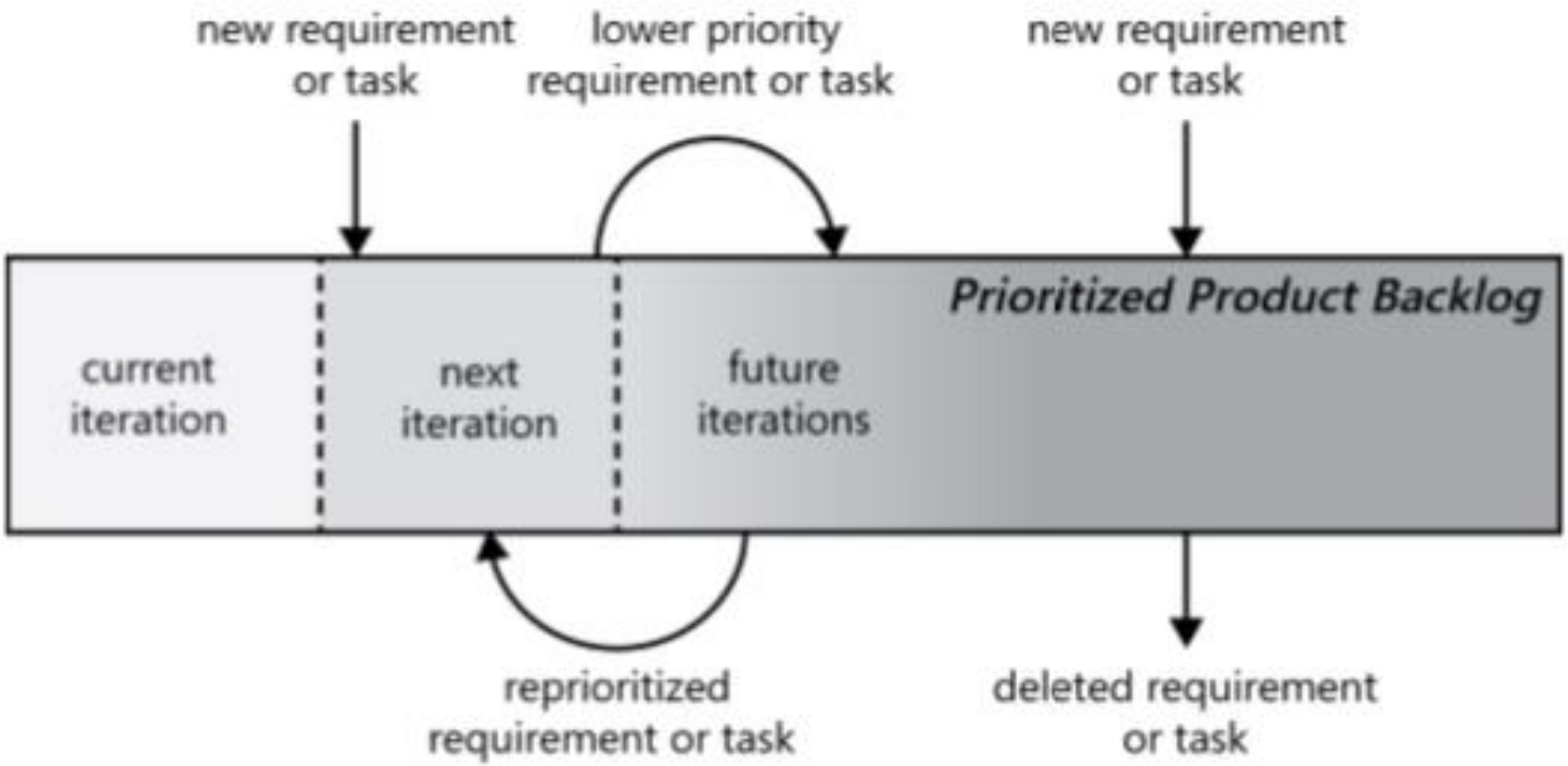
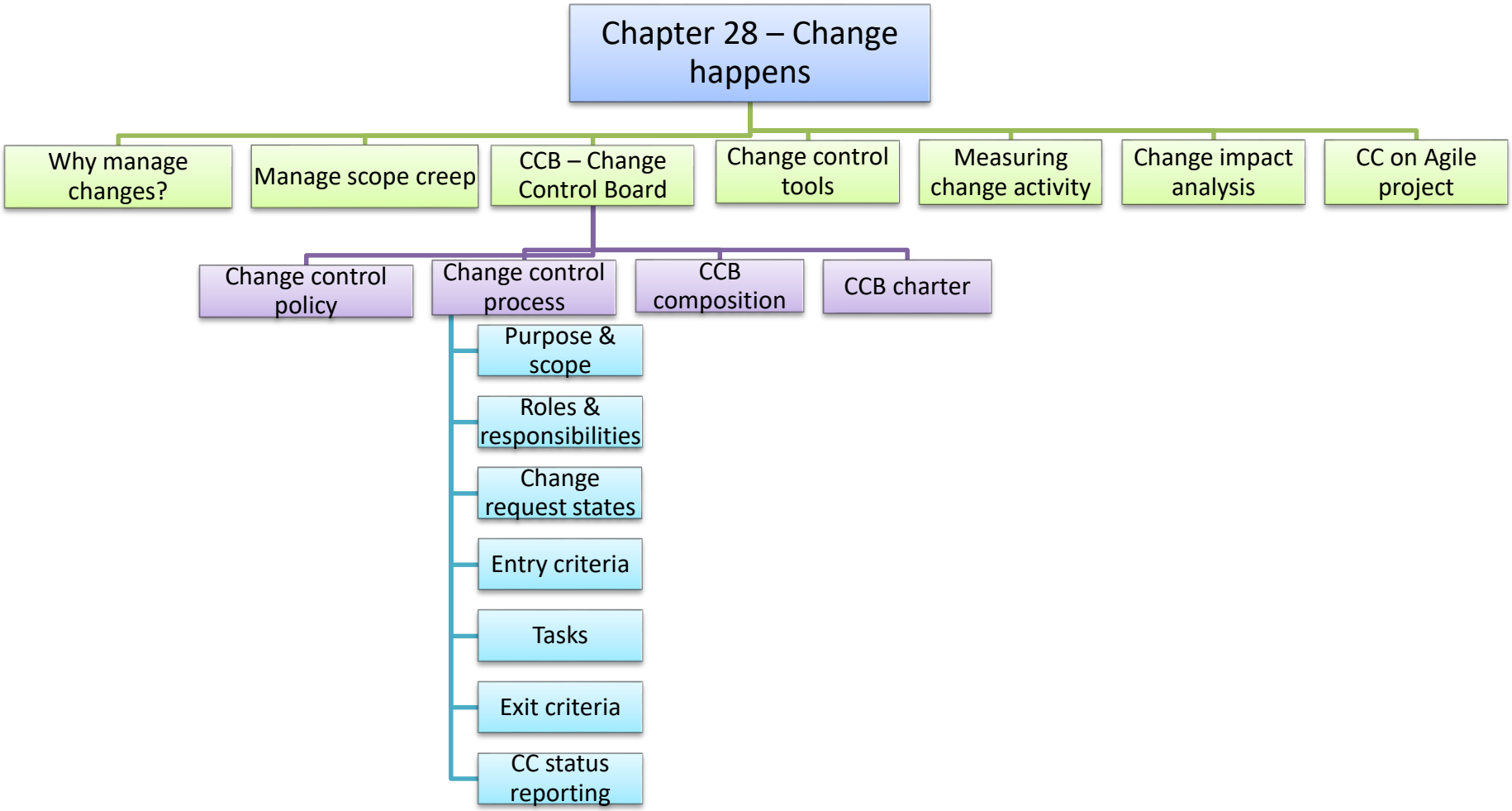


FIGURE 28-9 Agile projects manage change with a dynamic product backlog.

Review chapter 28



THE END

THANK YOU!