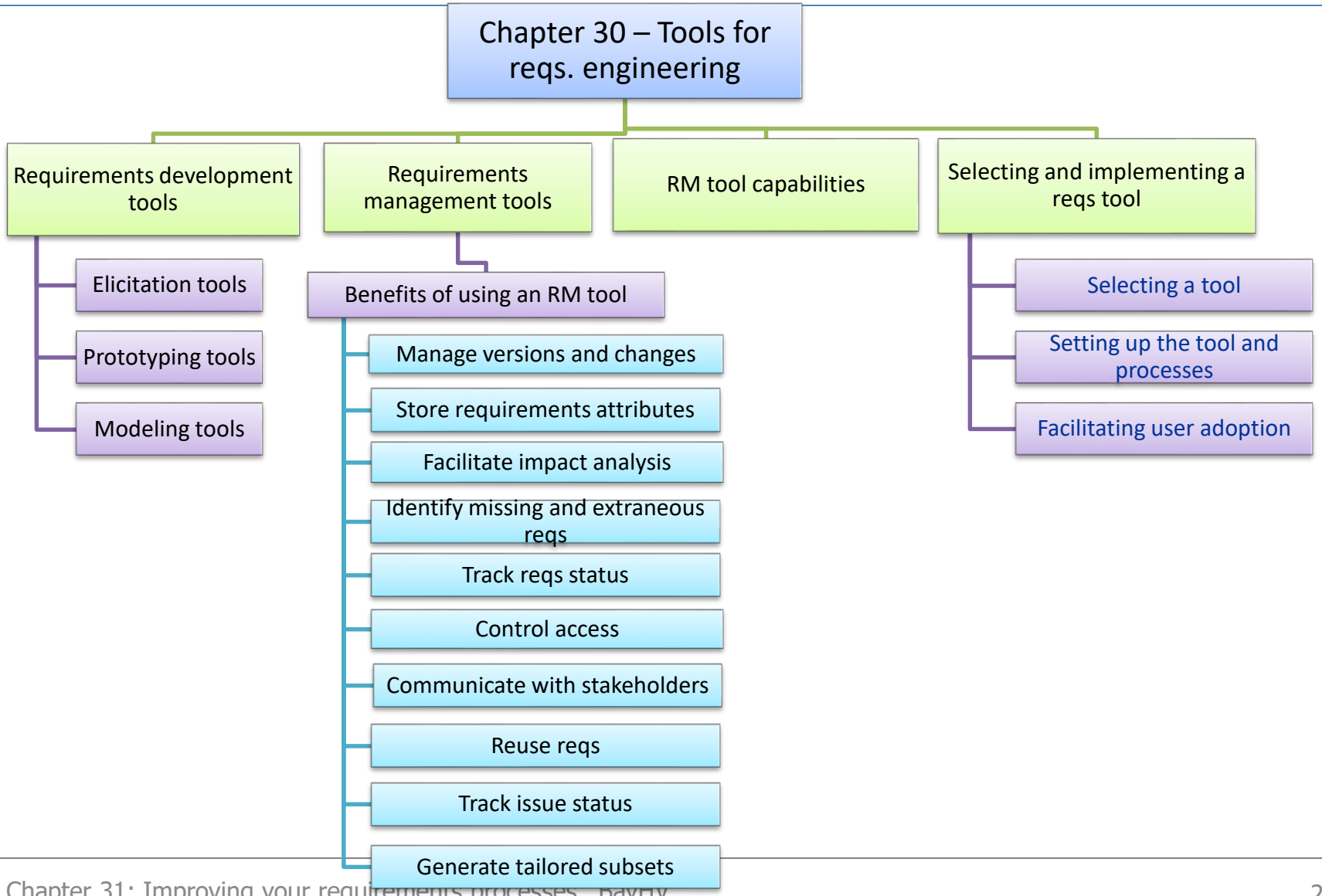
FPT UNIVERSITY

ĐẠI HỌC FPT CẦN THƠ

Chapter 31

Improving your requirements processes

Review chapter 30



Objectives

- Student could understand how requirements relate to various other project processes and stakeholders.
- Student enhance some basic concepts about software process improvement and a suggested process improvement cycle.
- Student enhance a list several useful requirements "process assets" that your organization should have available.
- Enhance a process improvement road map for implementing improved requirements engineering processes.

Contents

- How requirements relate to other project processes.
- Requirements and various stakeholder groups.
- Gaining commitment to change.

Why you need to improve your requirements processes?

- The ultimate objective of process improvement is to *reduce the cost of creating* and *maintaining software*, thereby *increasing the value delivered by projects*. Ways to accomplish this include:
  - Correcting problems encountered on previous projects that arose from process shortcomings.
  - Anticipating and preventing problems that you might encounter on future projects.
  - Adopting practices that are more efficient and effective than those currently being used.

How requirements relate to other project processes

- Requirements lie at the heart of every well-run software project, supporting and enabling the other technical and management activities.
- Changes that you make in your requirements development and management approaches will affect these other project processes, and vice versa.
- This picture illustrates some connections between requirements and other project processes.

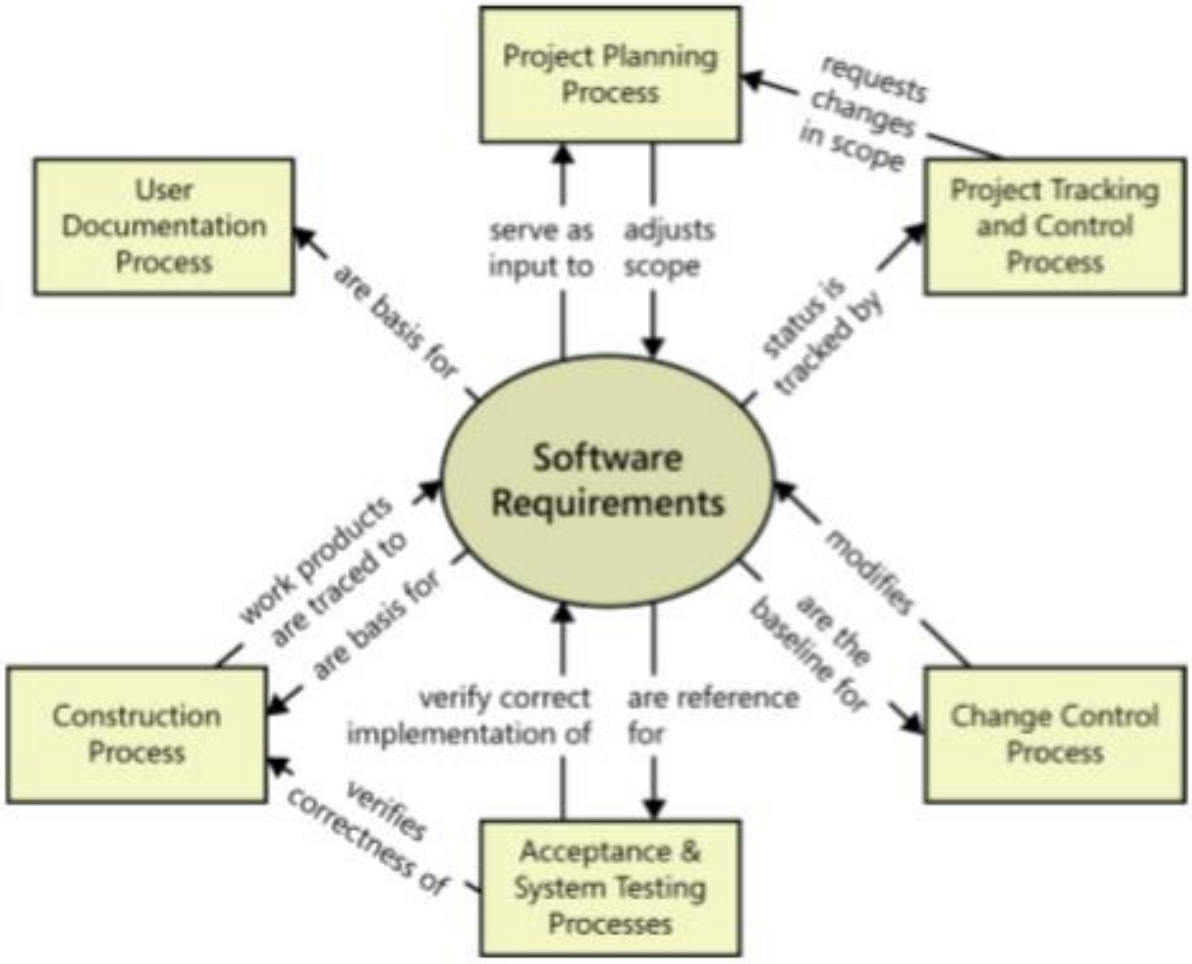


FIGURE 31-1 Relationship of requirements to other project processes.

How requirements relate to other project processes

- Project planning:
  - Requirements serve as the foundation of the project planning process. The planners select an appropriate software development life cycle and create resource and schedule estimates based on the requirements.
  - Project planning might indicate that it's not possible to deliver the entire desired feature set within the available bounds of resources and time.
- Project tracking & control:
  - Project tracking includes monitoring the project's status so the project manager can see whether construction and verification are proceeding as intended.
  - If they are not, management, customers, or other stakeholders might need to request scope modification through the planning process.
- Change control:
  - After a set of requirements has been baselined, all subsequent changes and additions should be made through a defined change control process.
  - Requirements changes modify the backlog of remaining work to be done and the priorities of the work items in the backlog.

How requirements relate to other project processes

- Acceptance & system testing:
  - User requirements and functional requirements are essential inputs to acceptance testing and system testing, respectively.
  - If the expected behavior of the software under various conditions isn't clearly specified, the testers will be hard-pressed to verify that all planned functionality has been implemented as intended.
- Construction:
  - Requirements are the basis for the design and implementation work, and they tie together the various construction work products.
  - Use design reviews to ensure that the designs correctly address all of the requirements.
  - Unit testing can determine whether the code satisfies the design specifications and the pertinent requirements.
- User documentation:
  - User documentation has to respond to the final changes in user interface displays and the features that got dropped or added at the last minute.

Requirements and various stakeholder groups

If you're the business analyst or project manager, explain to stakeholders in each area the information and participation you need from them if the product development effort is to succeed.

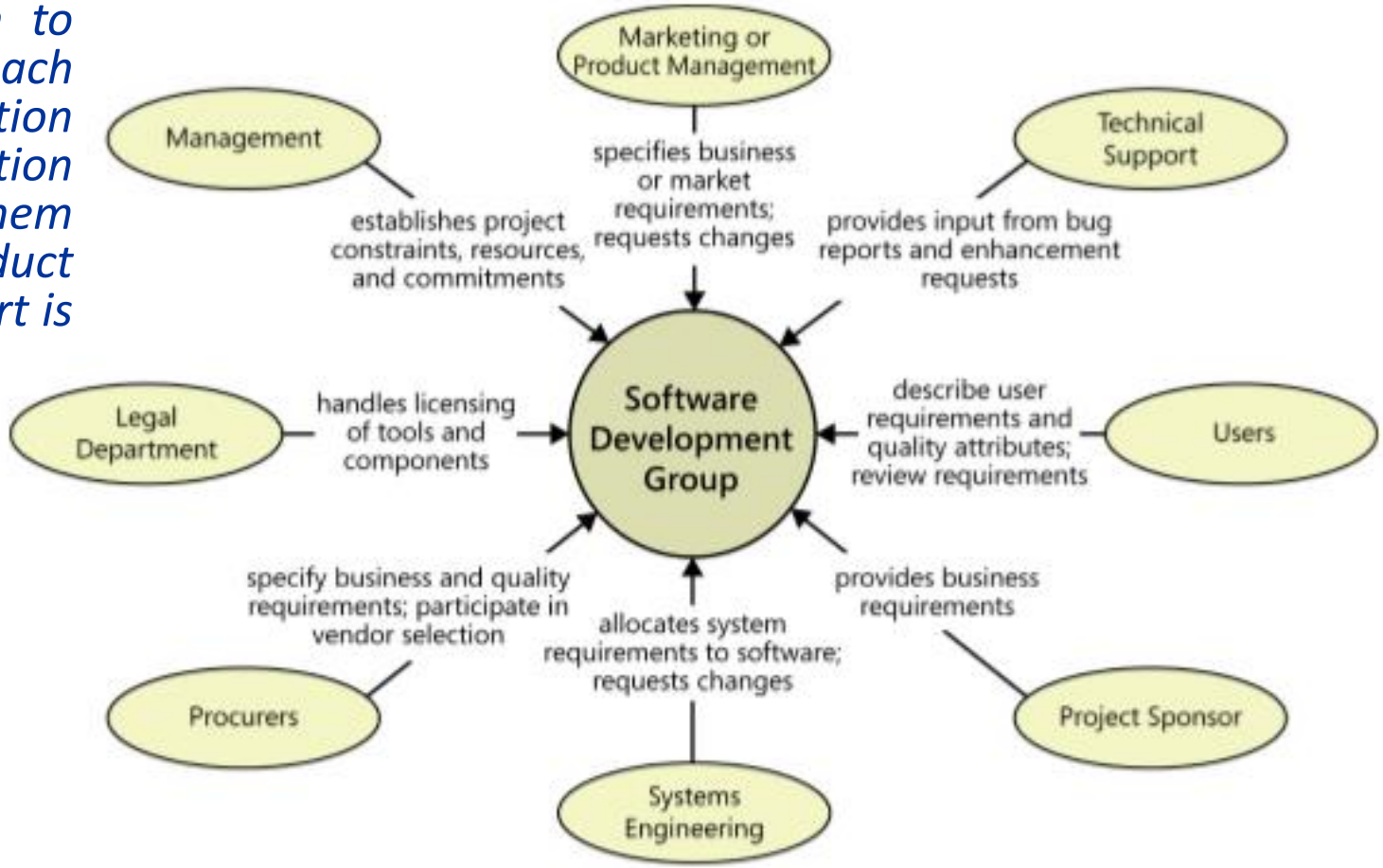


FIGURE 31-2 Requirements-related contributions from various stakeholders to the software development team.

Gaining commitment to change

- When a software organization changes its requirements processes, the interactions it has with other stakeholders change as well.
- People don't like to be forced out of their comfort zone, so there are some resistance from them to the process changes you propose. Understand the origins of the resistance so you can both respect it and defuse it (xoa dịu nó).
- Following are some forms of resistance that you might encounter:
  - People who are already too busy to get their project work done don't think they have time to invest in adopting better practices.
  - A change control process might be viewed as a barrier thrown up by development to make it harder to get changes made.
  - Some developers and managers view writing and reviewing requirements as bureaucratic time-wasters (kẻ lãng phí tgian quan liêu) that delay the "real work" of coding.

Gaining commitment to change

- We've often heard business analysts say that they can't make some process change in their organization without "management support.".
- Too often, management support translates merely (đơn thuần) into permission to do something different. But as an intelligent professional, you don't need management's permission to work in the best way you know how: that's your job.
- Figure 31-3 lists 10 signs that your organization's management is truly committed to excellent requirements processes.

1. Asking that requirements for a project be documented in an appropriate form.
2. Working with the business analyst to provide business requirements for each project.
3. Expecting requirements to be reviewed by appropriate stakeholders, including themselves when appropriate.
4. Asking stakeholders to agree on requirements before implementing each portion of the solution.
5. Ensuring that project plans include time and resources for requirements tasks.
6. Collaborating with other key stakeholders to gain their participation in requirements activities.
7. Establishing effective mechanisms and policies to handle requirements changes.
8. Investing in training, tools, books, and other resources for those involved in requirements activities.
9. Funding and staffing activities to improve the organization's requirements processes.
10. Making the time available for team members to spend on requirements process improvement activities.

FIGURE 31-3 Some behaviors that indicate management's commitment to excellent requirements processes.

Fundamentals of software process improvement

The following principles of software process improvement:

1. **Process improvement should be evolutionary and continuous**: Instead of aiming for perfection, develop a few improved templates and procedures and get started with implementation. Adjust your approaches as the team gains experience with the new techniques.
2. **People and organizations change only when they have an incentive to do so**: The strongest incentive for change is pain (nổi đau) - real pain people have experienced on previous projects.
   - The project missed deadlines because requirements were more extensive than expected.
   - Developers worked a lot of overtime because of misunderstood or ambiguous requirements.
   - System test effort was wasted because the testers didn't understand what the product was supposed to do.
   - The right functionality was present, but users were dissatisfied because of sluggish (chậm chạp) performance, poor usability, or other quality shortcomings.
   - The organization experienced high maintenance costs because customers requested many enhancements that could have been identified during requirements elicitation.
   - Requirement changes weren't implemented appropriately during the course of the project, so the delivered solution did not meet the customer needs.
   - Edits to requirements were lost or overwritten because multiple BAs were working on them concurrently without a version control process.
   - Customers were not available to clarify and flesh out requirements.

Fundamentals of software process improvement

The following principles of software process improvement:

3. Process changes should be goal-oriented: Before you begin the journey to superior processes, make sure you know your objectives. Do you want to reduce the amount of work that is redone because of requirements problems? Do you want to overlook fewer requirements during implementation? Do you want to cut unneeded features sooner?
4. Treat your improvement activities as mini-projects: Perform the planning, tracking, measurement, and reporting that you'd do for any project, scaled for the size of the improvement project. Write a simple action plan for each improvement area you tackle (giải quyết).

Root cause analysis

- It's important to focus your limited time and budget for process improvement efforts where they will do the most good. If you can identify the causes of any process shortcomings you've experienced, you can have chances to improvement opportunities.
- *Root cause analysis* seeks to identify the underlying (cơ bản) factors that contribute to an observed problem, distinguishing symptoms from their causes.
- Root cause analysis involves asking *"why"* the problem exists several times in succession, each time probing (điều tra) for the reason that underlies (nằm ở dưới) the answer to the previous *"why"* question.

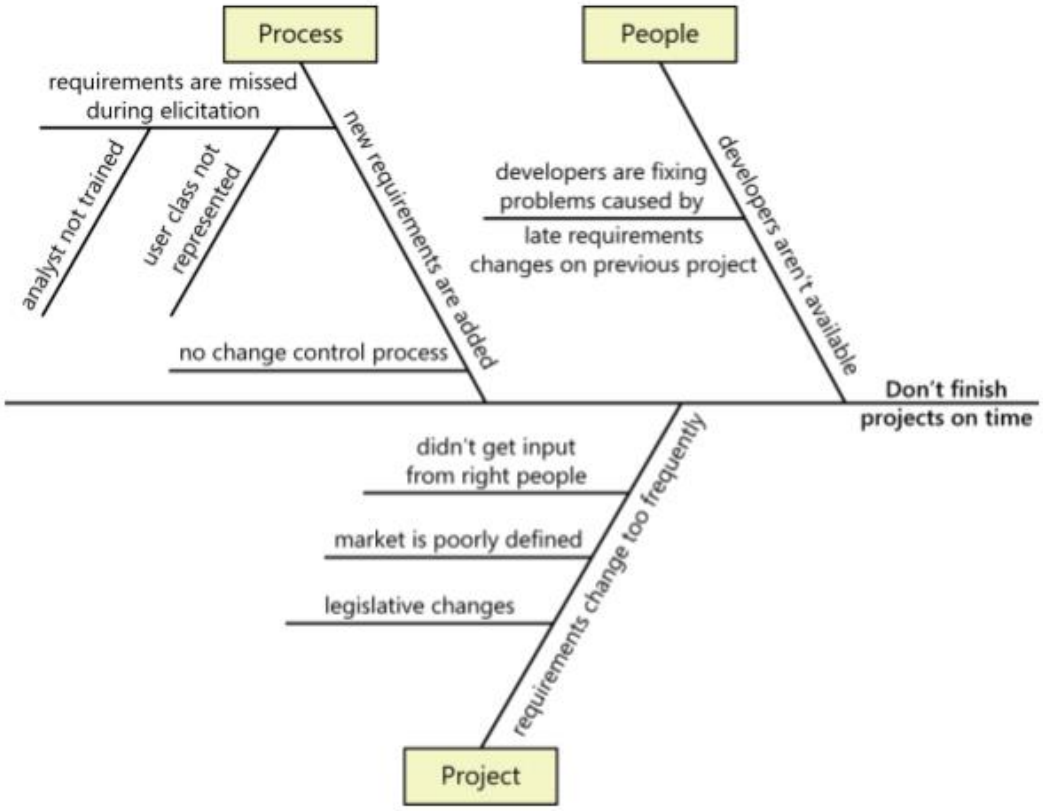


FIGURE 31-4 A cause-and-effect diagram identifying root causes for identified problem symptoms.

The process improvement cycle

- This cycle helps you to improve your processes.

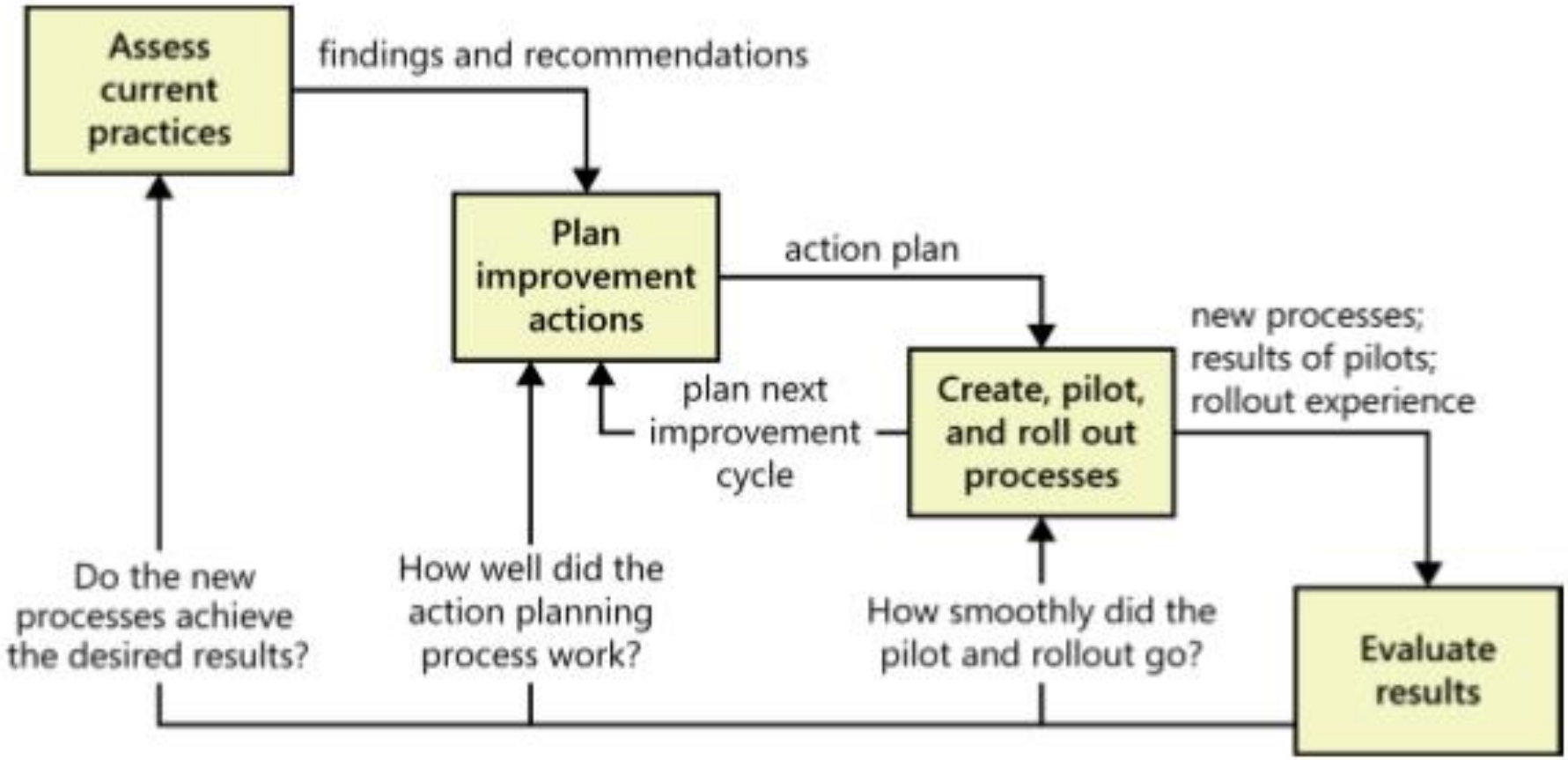


FIGURE 31-5 The software process improvement cycle.

The process improvement cycle

- Access current practices:
  - Step 1 of any improvement activity is to assess the practices currently being used to identify their strengths and shortcomings. The assessment lays the foundation for selecting the changes you should make.
- Plan improvement actions:
  - Tactical action plans target specific improvement areas, such as the ways you elicit or prioritize requirements.
  - Each action plan should identify measurable improvement goals, the participants, and the individual action items that must be completed to implement the plan.
  - A plan for requirements management improvements that included these action items:
    - Draft a requirements change control process.
    - Review and revise the change control process.
    - Pilot the change control process with Project A.
    - Revise the change control process based on feedback from the pilot.
    - Evaluate problem-tracking tools, and select one to support the change control process.
    - Procure the problem-tracking tool, and customize it to support the change control process.
    - Roll out the new change control process and tool to the organization.

The process improvement cycle

- Create, pilot, and roll out processes:
  - Many approaches that seem like a good idea in the abstract (về mặt lý thuyết) turn out (hóa ra) to be less effective than anticipated (dự đoán). Therefore, pilot most of the new procedures or templates you create on a small scale before implementing them for real.
  - Keep the following suggestions in mind for your process pilots:
    - Select pilot participants who will give the new approaches a fair try and provide helpful feedback.
    - Quantify the criteria the team will use to evaluate the pilot's results.
    - Identify the stakeholders who need to be informed about the pilot.
    - Consider piloting portions of the new processes on different projects. This engages (thu hút) more people in trying new approaches, which increases awareness, feedback, and buy-in.
    - As part of the evaluation, ask pilot participants how they would feel if they had to go back to their former ways of working.

The process improvement cycle

- Evaluate results:
  - The final step of a process improvement cycle is to evaluate the activities performed and the results achieved.
  - This evaluation will help the team do an even better job on future improvement activities. Assess how smoothly the pilots ran. How effective were they in resolving the uncertainties about the new processes? Would you change anything the next time you conduct a process pilot?
  - A critical step is to assess whether the new processes are yielding (mang lại) the desired results. Some new practices deliver visible improvements quickly, but others take time to demonstrate their full value.

Requirements engineering process assets

- High-performance projects have effective processes for all of the requirements engineering components: elicitation, analysis, specification, validation, and management.
- To facilitate the performance (thực hiện) of these processes, every organization needs a collection of requirements *process assets*.
- A process encompasses the actions you take and the deliverables you produce; process assets help the team members perform processes consistently and effectively.
- These process assets will help those involved in the project understand the steps they should follow and the work products they're expected to create.
- Next slide shows you the types of process assets.

Requirements engineering process assets

TABLE 31-1 Types of process assets

Type	Description
Checklist	A list that enumerates activities, deliverables, or other items to be noted or verified. Checklists are memory joggers. They help ensure that busy people don't overlook important details.
Example	A representative of a specific type of work product. Accumulate and share good examples as your project teams create them.
Plan	An outline of how an objective will be accomplished and what is needed to accomplish it.
Policy	A guiding principle that sets a management expectation of behaviors, actions, and deliverables. Processes should enable satisfaction of the policies.
Procedure	A step-by-step description of the sequence of tasks that accomplishes an activity. Describe the tasks to be performed and identify the project roles that perform them. Guidance documents can support a process or procedure with tutorial information and helpful tips.
Process description	A documented definition of a set of activities performed for some purpose. A process description might include the process objective, key milestones, participants, communication steps, inputs and outputs, deliverables, and how to tailor the process to different project situations.
Template	A pattern to be used as a guide for producing a work product. Templates for key project documents provide many "slots" for capturing and organizing information. Guidance text embedded in the template will help the document author use it effectively. Other templates define a structure that is useful for writing a specific type of information, such as a functional requirement, quality attribute, business rule, or user story.

Requirements engineering process assets

- Figure 31-8 identifies some valuable process assets for requirements engineering.
- Store these items in a shared process assets library for ease of access and ready availability, and establish mechanisms for improving them with experience.
- Many of the process assets in Figure 31-8 are available with the companion content for this book.

Requirements Development Process Assets
• Requirements development process • Requirements allocation procedure • Requirements prioritization procedure • Vision and scope template • Use case template • Software requirements specification template • Requirements review checklist

Requirements Management Process Assets
• Requirements management process • Requirements status tracking procedure • Change control process • Change control board charter template • Requirements change impact analysis checklist • Requirements tracing procedure

FIGURE 31-8 Key process assets for requirements development and requirements management.

Creating a requirements process improvement road map

- The process improvement road map sequences improvement actions to yield the greatest and quickest benefits with the smallest investment.
- Figure 31-9 illustrates one organization's road map for improving its requirements processes.
- Implement each threaded set of improvement activities from left to right. After you've created a road map, give ownership of each milestone to an individual, who can then write an action plan for achieving that milestone. Then turn those action plans into actions!

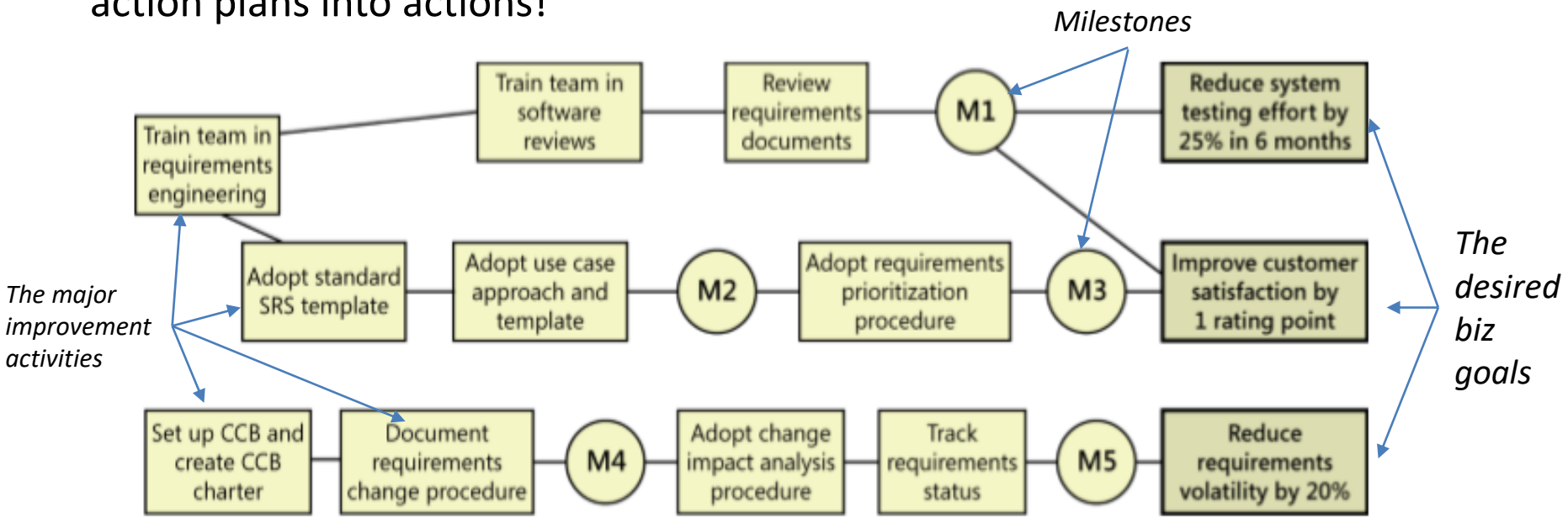
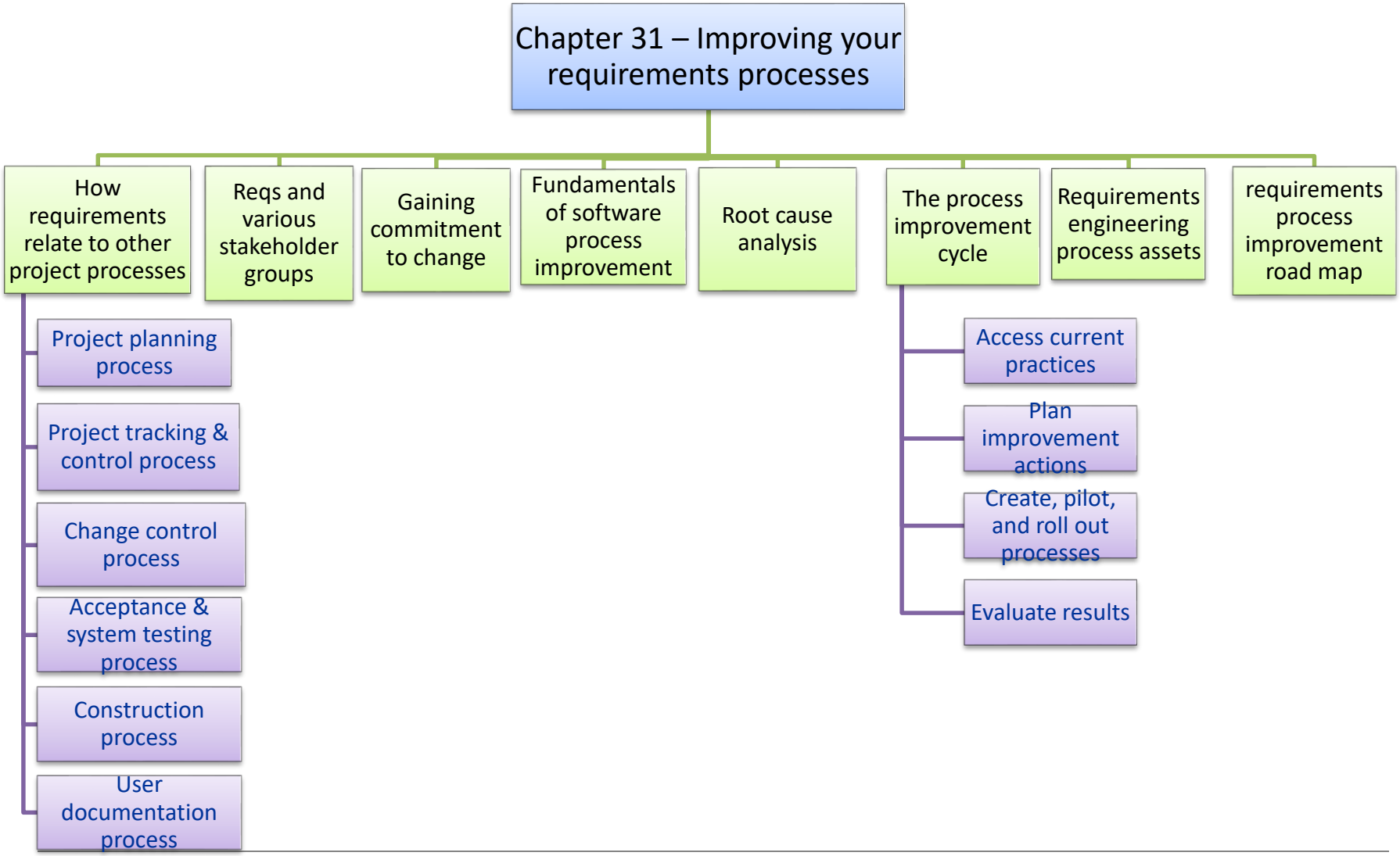


FIGURE 31-9 Sample requirements process improvement road map.

Review chapter 31



THE END
THANK YOU!