SOFE 2720

Principles of Software and Requirements Engineering

Principles that Guide Practice – Activity Review

Notes adapted from - Software Engineering: A Practitioner's Approach, 9/e

Chapter 6

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Overview

- In this set of slides we will review the class activity commenting on any significant challenges.
- The SE guiding principles in this chapter are divided into several categories:
  1. Process
  2. Practice
  3. Communication
  4. Planning
  5. Modeling
  6. Construction
  7. Testing
  8. Deployment

Overview

- The class activity tried to get you to read through the guidelines briefly.
- Let’s look at these questions.

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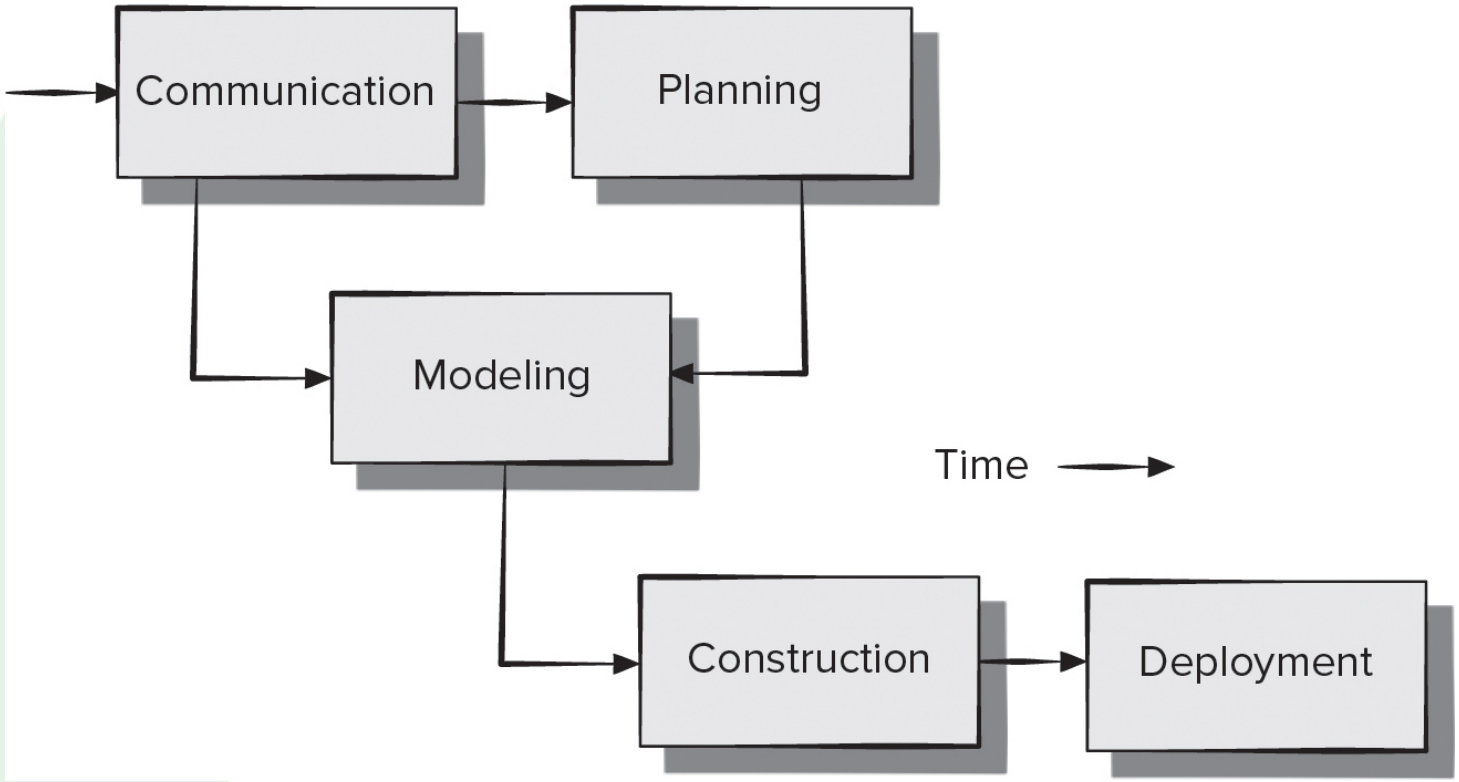
Q1 – Process Guidelines

- Of the 8 core principles that guide process which do you believe is most important and why?
  - Any of the 8 can be chosen. There is no singular principle that is more important than another.
- Let's look at these in more detail

Simplified Process Framework



Principles that Guide Process - I

- **Principle #1. *Be agile.*** Whether the process model you choose is prescriptive or agile, the basic tenets of agile development should govern your approach.
- **Principle #2. *Focus on quality at every step.*** The exit condition for every process activity, action, and task should focus on the quality of the work product that has been produced.
- **Principle #3. *Be ready to adapt.*** When necessary, adapt your approach to constraints imposed by the problem, the people, and the project itself.
- **Principle #4. *Build an effective team.*** Software engineering process and practice are important, but the bottom line is people. Build a self-organizing team that has mutual trust and respect.

Principles that Guide Process - II

- **Principle #5. *Establish mechanisms for communication and coordination.*** Projects fail because important information falls into the cracks and/or stakeholders fail to coordinate their efforts to create a successful end product.
- **Principle #6. *Manage change.*** The approach may be either formal or informal, but mechanisms must be established to manage the way changes are requested, assessed, approved and implemented.
- **Principle #7. *Assess risk.*** Lots of things can go wrong as software is being developed. It's essential that you establish contingency plans.
- **Principle #8. *Create work products that provide value for others*.** Create only those work products that provide value for other process activities, actions or tasks.

Q2 - Describe the concept of Separation of Concerns in your own words.

- This is an important and fundamental SE concept to understand.
- What I am looking for here is the understanding that modules that have specific functionality and interfaces makes it easier to develop and validate these modules to eventually achieve the functionalities of the more complex application
- Let's look more carefully at all the SE practice guidelines.

Principles that Guide Practice - I

- **Principle #1. *Divide and conquer.*** Stated in a more technical manner, analysis and design should always emphasize *separation of concerns* (SoC).
- **Principle #2. *Understand the use of abstraction.*** At its core, an abstraction is a simplification of some complex element of a system used to communicate meaning in a single phrase.
- **Principle #3. Strive for consistency.** A familiar context makes software easier to use.
- **Principle #4. *Focus on the transfer of information.*** Pay special attention to the analysis, design, construction, and testing of interfaces.

Principles that Guide Practice - II

- **Principle #5.** ***Build software that exhibits effective modularity.*** Separation of concerns (Principle #1) establishes a philosophy for software. *Modularity* provides a mechanism for realizing the philosophy.

- **Principle #6.** ***Look for patterns.*** Brad Appleton [App00] suggests that: "The goal of patterns within the software community is to create a body of literature to help software developers resolve recurring problems encountered throughout all of software development.

- **Principle #7.** ***When possible, represent the problem and its solution from a number of different perspectives.***

- **Principle #8.** ***Remember that someone will maintain the software.***

Q3 – Why are models important in SE

- Generally speaking, models are important because they allow one to abstract the details of the product, look at the totality of the thing to be built, and slowly refine the abstractions to help with construction.
  - Models are required, but not all models are necessary. In particular models that are too detailed or complicated for a product can hinder progress.

Q4 - What is a successful test?

- Again the idea here is to get you to look through the Testing guidelines though they don't really help you answer this question.

  – A successful test is one that uncovers an as-yet-undiscovered error.

Testing Principles Related to Requirements

- Principle #1. All tests should be traceable to customer requirements.
  - This is a key principle to remember at this point. This is performed by creating a traceability matrix that relates requirements to tests.

- Principle #2. Tests should be planned long before testing begins.
  - This is inline with the concept that acceptability tests should be defined at the time that requirements are being defined.

Communication Guidelines Exercise

- The objective in this exercise was to understand in more depth the Communication Guidelines by looking at a case study.
- Let’s look at these more carefully.

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Communications Case Study

Principle	Case Study Comment
Listen	Lisa did not listen to Jamie
Prepare	Jamie did some preparation of the product; Vinod said he was going to read up Requirements Engineering
Facilitation	No facilitator because there was no meeting
Face-to-Face	Preferred telephone over face to face
Take Notes	None taken
Collaboration	Not clear that there is any collaboration with Lisa yet but some between Jamie and Vinod
Focused	It seems that they are jumping between different feature ideas
Draw a picture	Not applicable
Move on	Yes they are moving on
Negotiation	Not applicable

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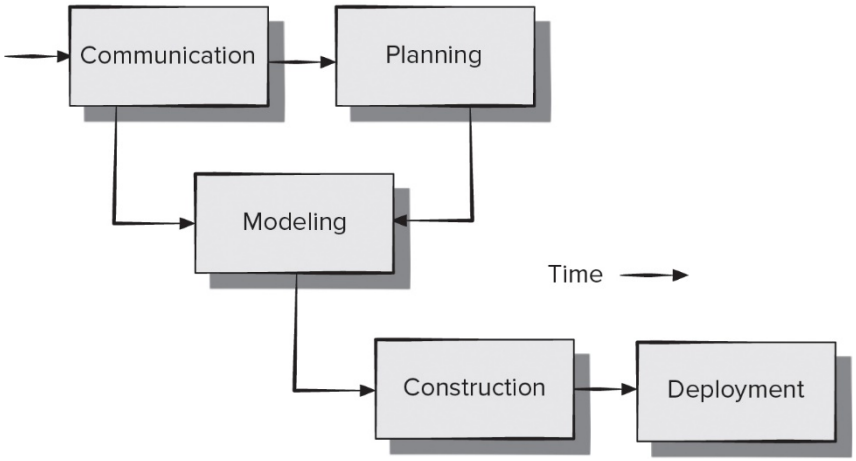
Summary

- These principles are very important and have been developed through experience.
- These principles will be reviewed in more detail the core steps are presented in the SE process.



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