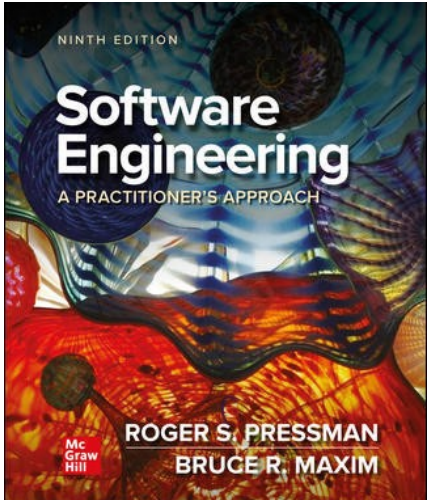
Engenharia de Software

Prof. Dr. Erik Aceiro Antonio

Fatores importantes no desenvolvimento e projeto de software

Fatores humanos
que afetam o projeto de software



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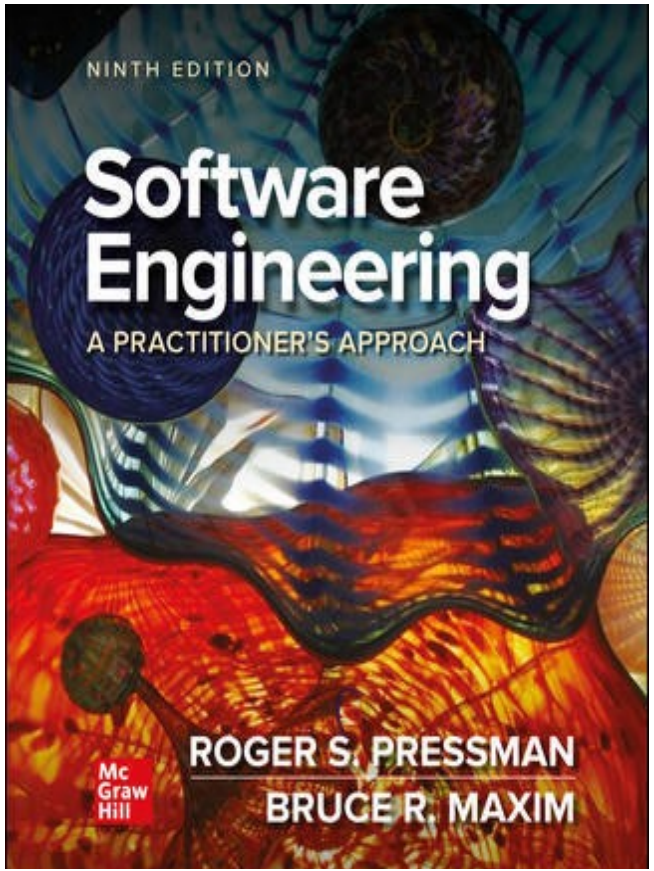
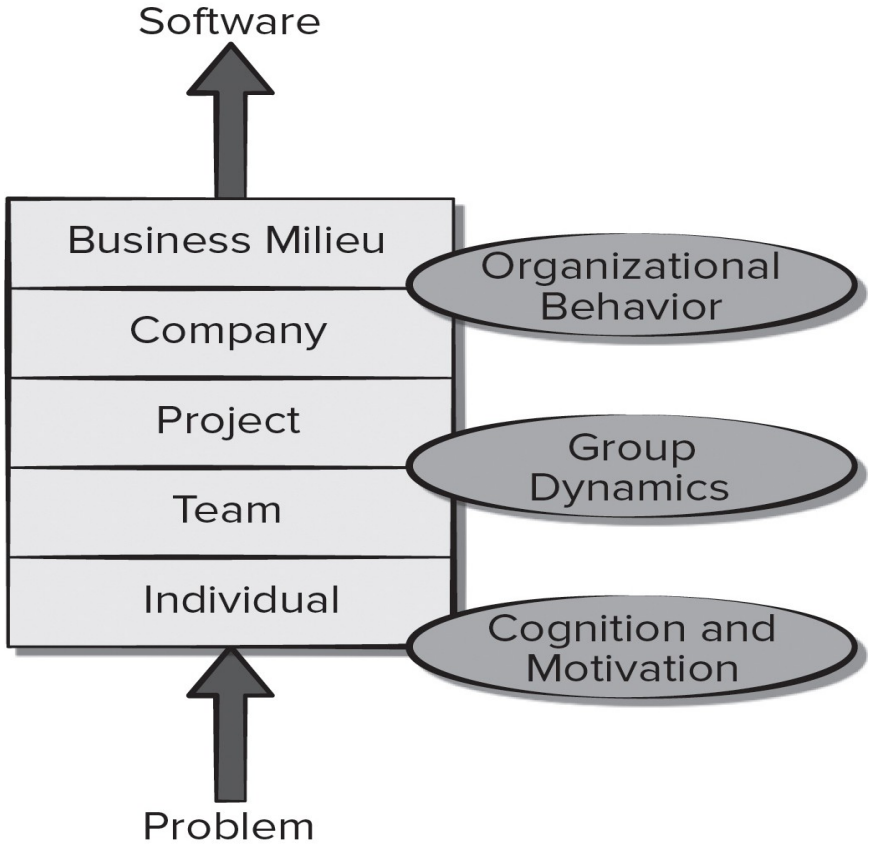
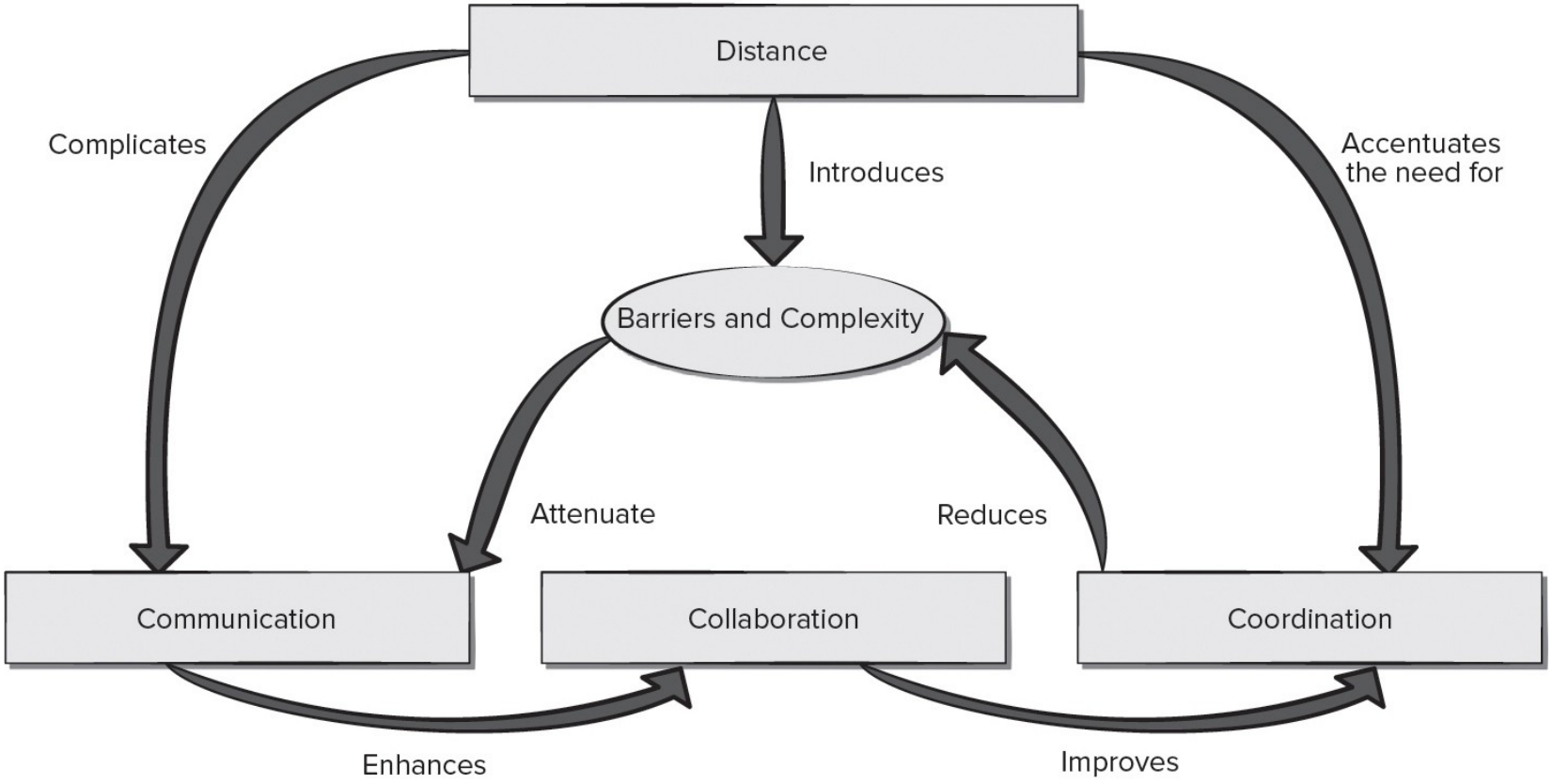
Chapter 5

Human Aspects of Software Engineering

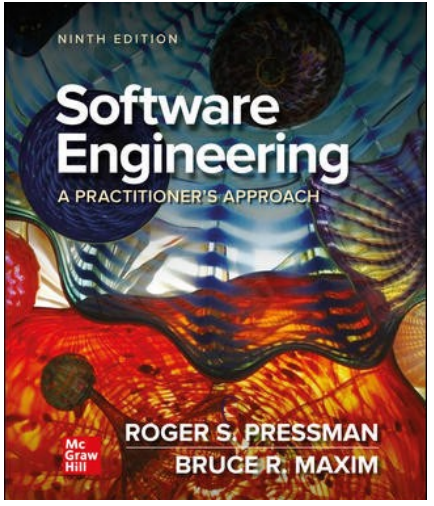
Part One - The Software Process







Princípios que guiam a prática



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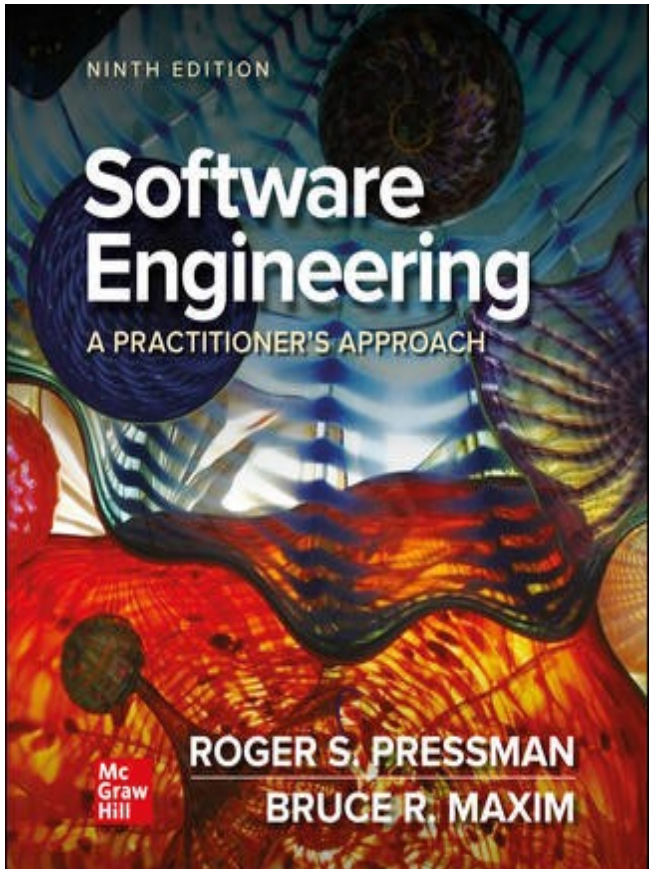
Chapter 6

Principles that Guide Practice

Part Two - Modeling



Principles that Guide Process [1]

- **Principle #1.** ***Be agile.*** Regards of your process model, let the basic tenets of agile development 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 produced.
- **Principle #3.** ***Be ready to adapt.*** Dogma has no place in software development. 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.

Principles that Guide Process 2

- **Principle #5.** ***Establish mechanisms for communication and coordination.*** Projects fail because information falls into the cracks and/or stakeholders fail to coordinate their efforts.
- **Principle #6.** ***Manage change.*** Approach may formal or informal. You need mechanisms to manage how changes are requested, assessed, approved and implemented.
- **Principle #7.** ***Assess risk.*** Lots of things can go wrong as software is being developed, 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.

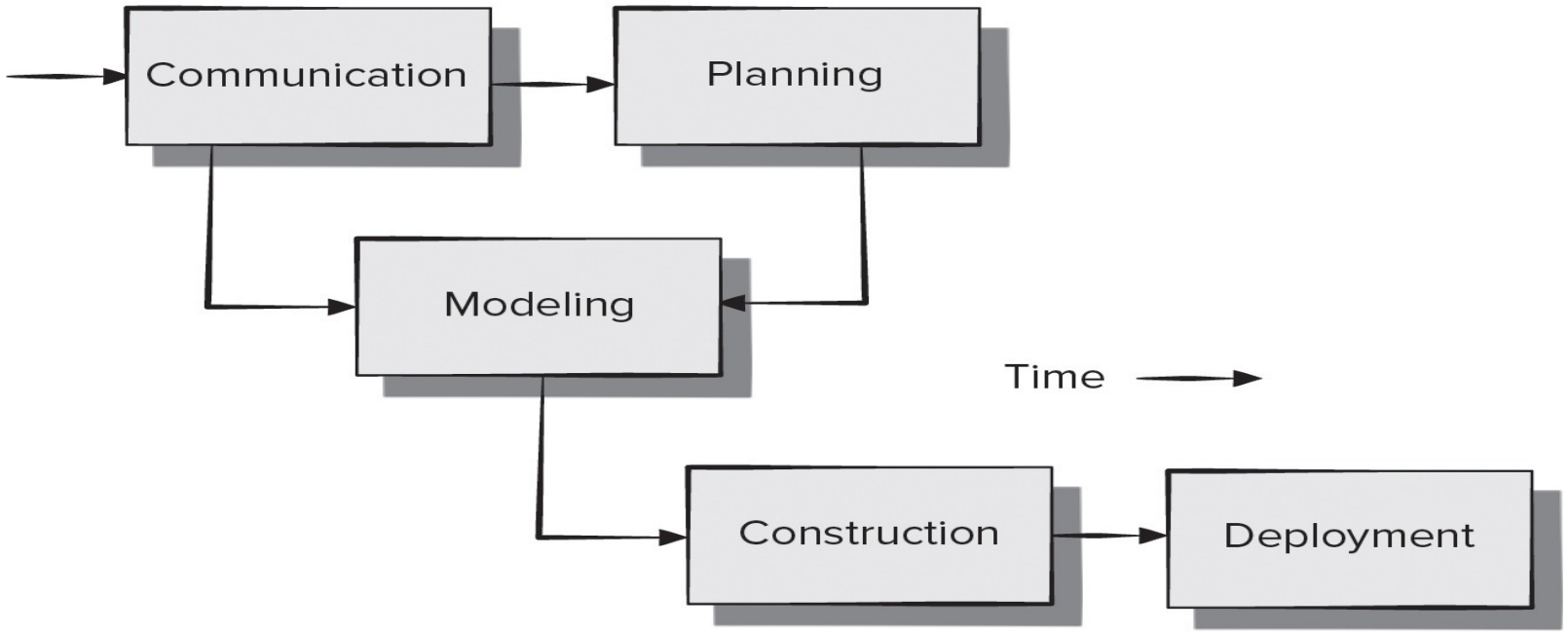
Principles that Guide Practice [1]

- **Principle #1.** ***Divide and conquer.*** **A**nalysis and design should always emphasize *separation of concerns* (SoC).
- **Principle #2.** ***Understand the use of abstraction.*** Abstraction is a simplification of a complex system element used to communication meaning simply.
- **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 2

- **Principle #5.** ***Build software that exhibits effective modularity.*** Provides a mechanism for realizing the philosophy of Separation of concerns .
- **Principle #6.** ***Look for patterns.*** The goal of patterns is to create a body of literature to help developers resolve recurring problems encountered in software development.
- **Principle #7.** ***Use multiple viewpoints.*** Represent the problem and solution from different perspectives.
- **Principle #8.** ***Some consumes your work products.*** Remember that someone will maintain the software.

Simplified Process Framework



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Atividade #1

Avaliação da Carga Cognitiva

2019 IEEE/ACM 27th International Conference on Program Comprehension (ICPC)

Measuring the Cognitive Load of Software Developers: A Systematic Mapping Study

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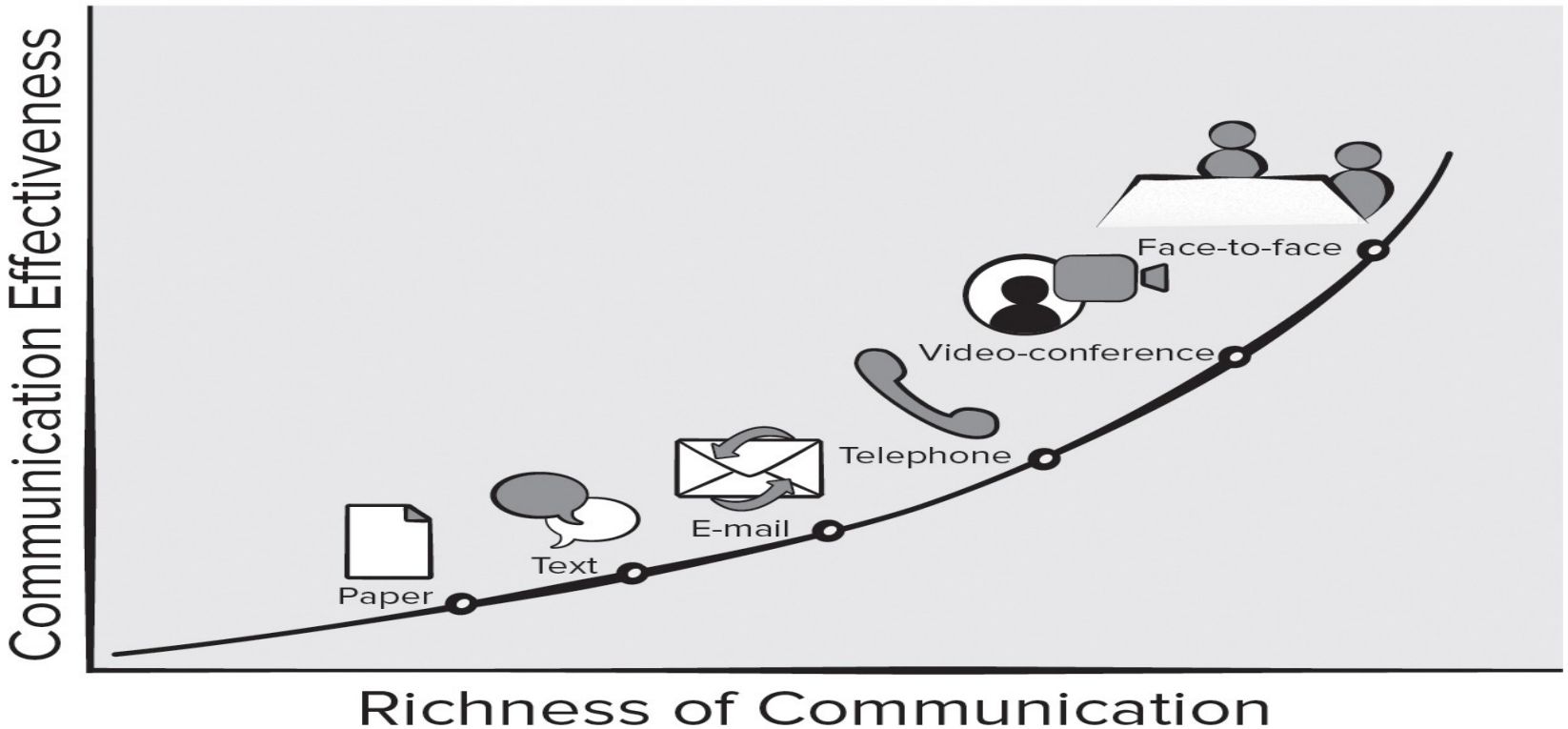
1) Faça a leitura do artigo
2) Como os autores definem Carga Cognitva em SE ?
3) Como foi feito o levantamento no trabalho dos autores ?
4) Cite as Top-5 propósitos de aumento de carga cognitiva.
5) Explique o que é uma Taxonomia de carga cognitva.

Entregar semana que vem 19/09 individualmente

Communications Principles [1]

- **Principle #1.** ***Listen.*** Try to focus on the speaker's words, not formulating your response to those words.
- **Principle # 2.** ***Prepare before you communicate.*** Understand a problem before meeting with others.
- **Principle # 3.** ***Someone should facilitate the activity.*** Every communication meeting should have a leader to keep the conversation moving in a productive direction.
- **Principle #4.** ***Face-to-face communication is best.*** Visual representations of information can be helpful.
- **Principle # 5.** ***Take notes and document decisions.*** Someone should serve as a "recorder" and write down all important points and decisions.

Communications Mode Effectiveness



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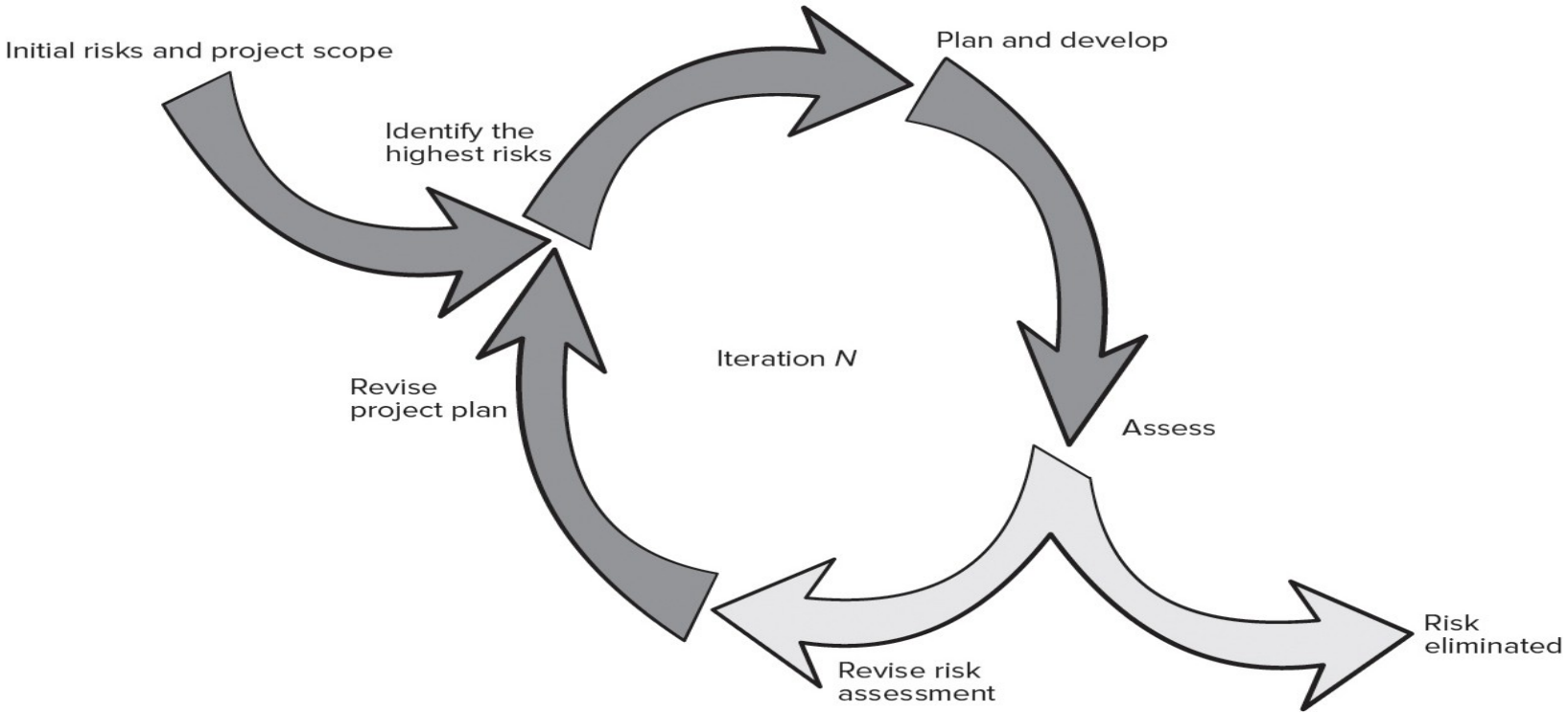
Communications Principles 2

- **Principle # 6.** ***Strive for collaboration.*** *C*onsensus occurs when collective team knowledge is combined.
- **Principle # 7.** ***Stay focused, modularize your discussion.*** The more people involved in communication the more likely discussion will bounce between topics.
- **Principle # 8.** ***If something is unclear, draw a picture.***
- **Principle # 9.** ***(a) Once you agree to something, move on; (b) If you can't agree to something, move on; (c) If a feature or function is unclear and cannot be clarified at the moment, move on.***
- **Principle # 10.** ***Negotiation is not a contest or a game. It works best when both parties win.***

Iterative Planning Process



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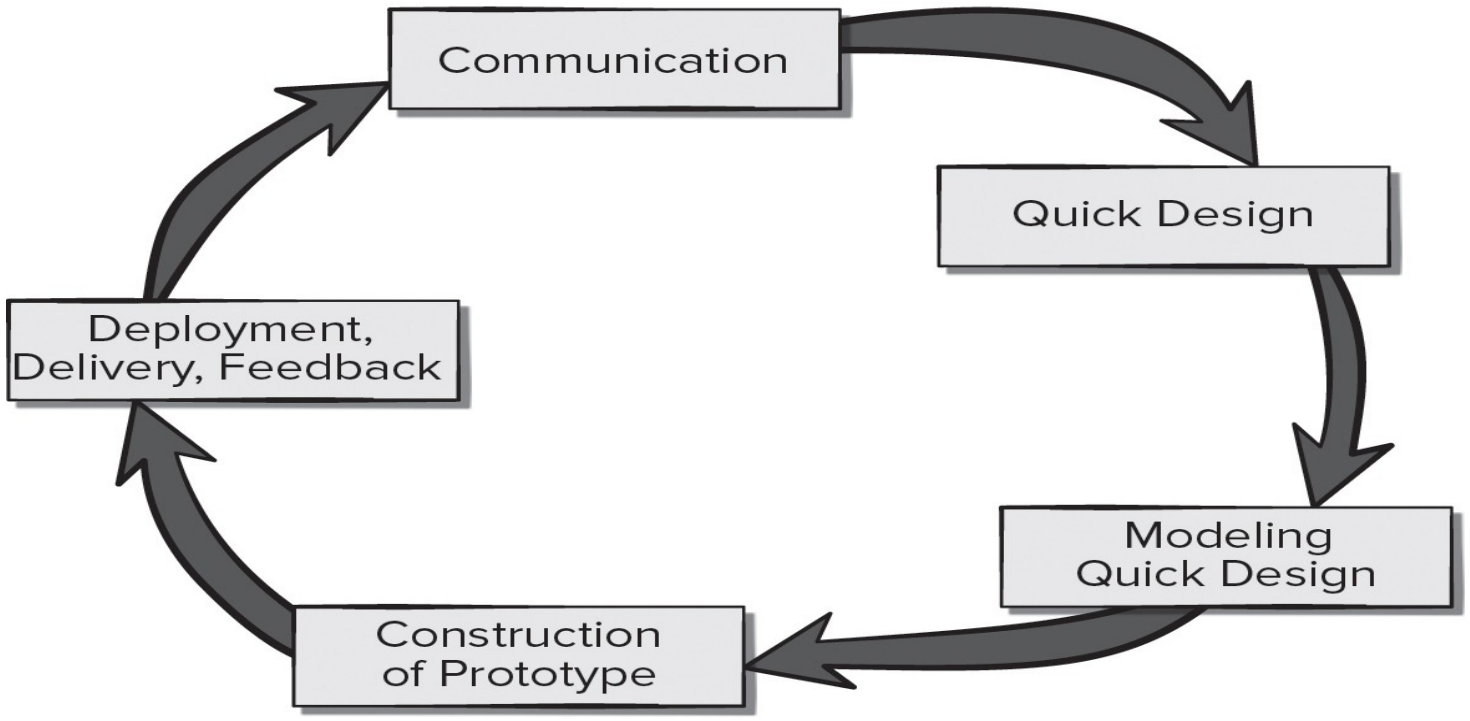
Planning Principles [1]

- **Principle #1.** ***Understand the scope of the project.*** Scope provides the software team with a destination as the roadmap is created.
- **Principle #2.** ***Involve the customer in the planning activity.*** They define priorities and project constraints.
- **Principle #3.** ***Recognize that planning is iterative.*** A project plan is likely to change as work begins.
- **Principle #4.** ***Estimate based on what you know.*** Estimation provides an indication of effort, cost, and task duration, based on team's current understanding of work.
- **Principle #5.** ***Consider risk as you define the plan.*** Contingency planning is needed for identified high impact and high probability risks.

Planning Principles [2]

- **Principle #7.** ***Adjust granularity as you define the plan.*** *Granularity* refers to the level of detail that is introduced as a project plan is developed.
- **Principle #8.** ***Define how you intend to ensure quality.*** Your plan should identify how the software team intends to ensure quality.
- **Principle #9.** ***Describe how you intend to accommodate change.*** Even the best planning can be obviated by uncontrolled change.
- **Principle #10.** ***Track the plan frequently and make adjustments as required.*** Software projects fall behind schedule one day at a time.

Software Modeling



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Agile Modeling Principles [1]

- **Principle #1.** ***The primary goal of the software team is to build software not create models.***
- **Principle #2.** ***Travel light – don't create more models than you need.***
- **Principle #3.** ***Strive to produce the simplest model that will describe the problem or the software.***
- **Principle #4.** ***Build models in a way that makes them amenable to change.***
- **Principle #5.** ***Be able to state an explicit purpose for each model that is created.***

Agile Modeling Principles 2

- **Principle #6. Adapt the models you create to the system at hand.**
- **Principle #7. Try to build useful models, forget abut building perfect models.**
- **Principle #8. Don’t become dogmatic about model syntax. Successful communication is key.**
- **Principle #9. If your instincts tell you a paper model isn’t working you may have a reason to be concerned.**
- **Principle #10. Get feedback as soon as you can.**

Construction Principles - Coding [1]

Preparation Principles: Before you write one line of code, be sure you:

- **Principle 1.** ***Understand the problem to be solved.***
- **Principle 2.** ***Understand basic design principles and concepts.***
- **Principle 3.** ***Pick a programming language that meets the needs of the software to be built.***
- **Principle 4.** ***Select a programming environment that provides tools that will make your work easier.***
- **Principle 5.** ***Create a set of unit tests that will be applied once the component you code is completed.***

Construction Principles - Coding 2

Coding Principles: As you begin writing code, be sure you:

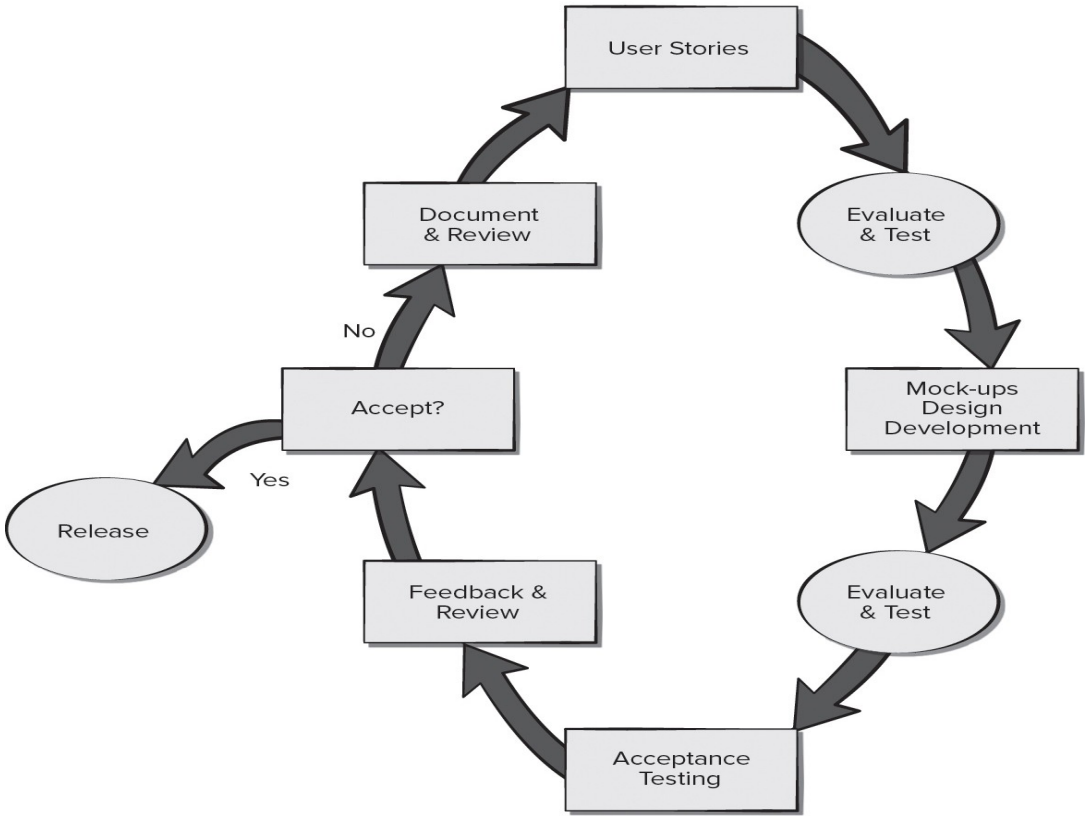
- **Principle 6.** ***Constrain your algorithms by following structured programming practice.***
- **Principle 7.** ***Consider the use of pair programming.***
- **Principle 8.** ***Select data structures that will meet the needs of the design.***
- **Principle 9.** ***Understand the software architecture and create interfaces that are consistent with it.***

Construction Principles - Coding 3

Validation Principles: After you've completed your first coding pass, be sure you:

- **Principle 10.** ***Conduct a code walkthrough when appropriate.***
- **Principle 11.** ***Perform unit tests and correct errors you've uncovered.***
- **Principle 12.** ***Refactor the code to improve its quality.***

Agile Testing



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Testing Principles [1]

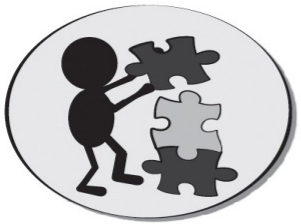
- **Principle #1.** ***All tests should be traceable to customer requirements.***
- **Principle #2.** ***Tests should be planned long before testing begins.***
  1. Testing is a process of executing a program with intent of finding an error,
  2. A good test case is one that has a high probability of finding an as-yet-undiscovered error.
  3. A successful test is one that uncovers an as-yet-undiscovered error.

- **Principle #3.** ***The Pareto principle applies to software testing.***

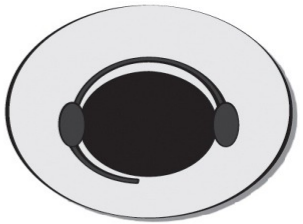
Testing Principles 2

- **Principle #4.** ***Testing should begin "in the small" and progress toward testing "in the large."***
- **Principle #5.** ***Exhaustive testing is not possible.***
- **Principle #6.** ***Testing effort for each system module commensurate to expected fault density.***
- **Principle #7.** ***Static testing can yield high results.***
- **Principle #8.** ***Track defects and look for patterns in defects uncovered by testing.***
- **Principle #9.** ***Include test cases that demonstrate software is behaving correctly.***

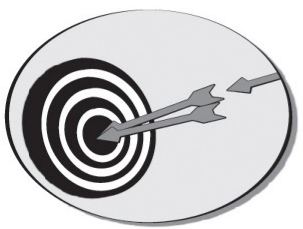
Software Deployment Actions



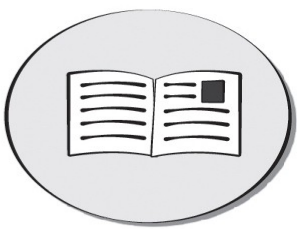
Assemble Deployment Package



Establish Support Regimen



Manage Customer Expectations



Provide Instructional Materials to End Users

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Deployment Principles [1]

- **Principle #1.** ***Customer expectations for the software must be managed.***
- **Principle #2.** ***A complete delivery package should be assembled and tested.***
- **Principle #3.** ***A support regime must be established before the software is delivered.***
- **Principle #4.** ***Appropriate instructional materials must be provided to end-users.***
- **Principle #5.** ***Buggy software should be fixed first, delivered later.***