software methodologies

software methodology

- life cycle model
- practices
- principles
- patterns

examples of methodologies

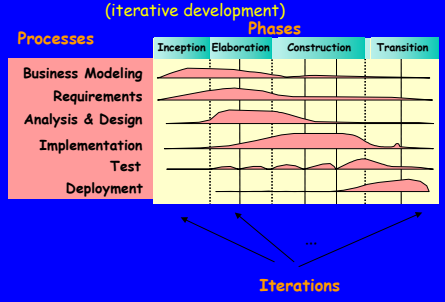
- rational unified process (RUP)
- extreme programming (XP)

Major RUP Principles

- iterative development

Rational Unified Process

(iterative development)



RUP Iteration

- Iteration i
  - Requirements:
    - What are you going to do?
    - How are you going to test it?
  - Design: How will you do it?
  - Implementation: Do it!
  - Test: Does it work?
  - Transition to phase i+1:
    - Integrate results into final project
    - Test integration
    - Acceptance test

Major RUP Principles

- iterative development
- risk-driven

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    ← choose highest-risk, highest-value issue
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Major RUP Principles

- iterative development
- risk-driven
- build core architecture early

RUP Iteration

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    - How are you going to test it?

    core is high risk/high value

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Major RUP Principles

- iterative development
- risk-driven
- build core architecture early
- continuously engage users for evaluation and feedback

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  - Design: How will you do it?
  - Implementation: Do it!

    customers help assign value
  - Test: Does it work?
  - Transition to phase i+1:
    - Integrate results into final project
    - Test integration
    - Acceptance test ← customers write acceptance test

Major RUP Principles

- iterative development
- risk-driven
- build core architecture early
- continuously engage users for evaluation and feedback
- test early and often

RUP Iteration

- Iteration i
  - Requirements:
    - What are you going to do?
    - How are you going to test it?
  - Design: How will you do it?
  - Implementation: Do it!
  - Test: Does it work? unit test
  - Transition to phase i+1:
    - Integrate results into final project
    - Test integration
    - Acceptance test

Major RUP Principles

- iterative development
- risk-driven
- build core architecture early
- continuously engage users for evaluation and feedback
- test early and often
- apply use cases

Definition of "Use Case"

- "The specification of sequences of actions that a system, subsystem, or class can perform by interacting with outside actors"

  (*UML Reference Manual*, Rumbaugh, Jacobson, and Booch).

example use case

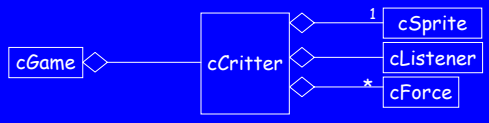
Play Game:

The player moves through a cave trying to kill the wumpus before the wumpus eats him.

Major RUP Principles

- iterative development
- risk-driven
- build core architecture early
- continuously engage users for evaluation and feedback
- test early and often
- apply use cases
- build diagrammatic models (UML)

Example: Class Diagrams



Major RUP Principles

- iterative development
- risk-driven
- build core architecture early
- continuously engage users for evaluation and feedback
- test early and often
- apply use cases
- build diagrammatic models (UML)
- etc.

examples of methodologies

- rational unified process (RUP)
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Manifesto for agile software development

We are uncovering better ways of developing software by doing it and helping others to do it. Through this work we have come to value:

Individuals and interactions over processes and tools.

Working software over comprehensive documentation.

Customer collaboration over contract negotiation.

Responding to change over following a plan.

That is, while there is value in the items on the right, we value the items on the left more.

life cycle
extreme programming

- short cycles
  - iteration: ~two weeks, ends in minor delivery that may or may not be put in production
  - release plan: ~six iterations, ends in major delivery that can be put into production
- budget is based on accomplishments of previous iteration/release

life cycle
extreme programming

- "requirements"
  - initially customer/developers try to identify the significant *user stories*
  - at the start of each iteration/release the customer prioritizes the user stories, the developers decide how many they can develop in the next iteration/release
  - at the end of each iteration/release the developers demo their work and the customer provides feedback. plans are changed as needed.

user stories
extreme programming

- the player moves through a cave trying to kill the wumpus before the wumpus eats him

Comparison

RUP

- Risk-driven, risks determined by developers
- Establish core architecture early
- Milestones are usually documents
- Test at early and often
- Tool heavy

XP

- Priority-driven, priorities determined by customer
- Build only what you need now
- Milestones are usually code
- Test constantly; build up test base
- Tool light

methodologies

we'll continue our discussion of methodologies throughout the next few weeks

schedule of events

- concept clarification
  - use cases
  - your team will identify major use cases for each game concept
- concept assessment
  - is it a good game?
  - can it be done in POP?
- concept decision