Software processes

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  - activities
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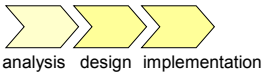
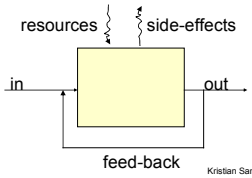
Software process

- Sequence of steps
- Result: software items
- Input
- Output
- Resource consumption
- Feed-back

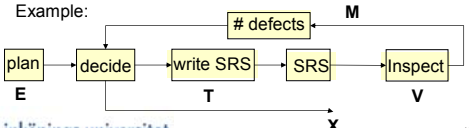




The effector process

- A process that verifies itself
- A process that exits under certain criteria
- ETVXM-architecture:
  - Entry
  - Task
  - Verify
  - Exit
  - Measure

Example:



Process levels

- Universal:
  - Processes suitable for many projects
- Worldly
  - Processes adapted to a certain project or product
- Atomic — document / whiteboard
  - Detailed processes for teams and individuals

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The software life-cycle

= time for concept -> time for “unavailability”

The SLC is made up by:

- Software life-cycle model
- Activities

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Software life-cycle models

- Waterfall model
- Incremental model
- Spiral model
- Win-win spiral model
- Iterative model: “RUP”

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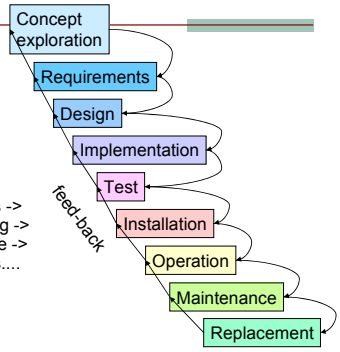
Waterfall model

de Facto reference model

- forward engineering
- manageable
- fixed documents

Negative:

- one-step delivery
- the negative circle:
  - sensitivity to changes -> more time for planning -> shortened design time -> sensitivity to changes....



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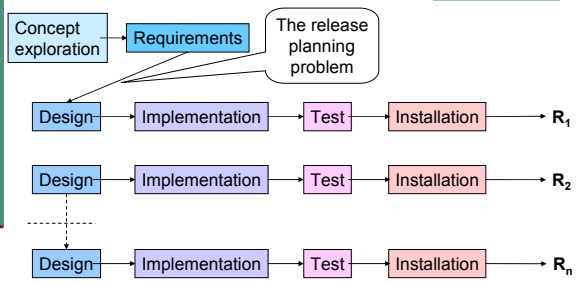
Incremental model



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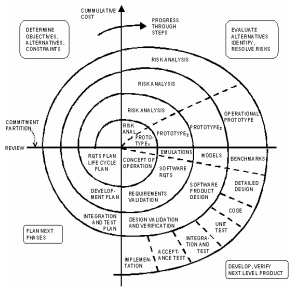
The original spiral model

Involves early phases in increments ⇒ the process is iterative

Original goal: handle risks

See:

http://www.sei.cmu.edu/cbs/spiral2000/



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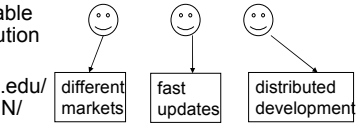
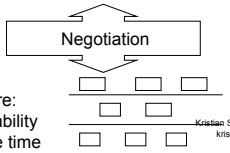
The win-win negotiation

- Find stake-holders' win condition
- Infer design attributes
- Negotiate a suitable architectural solution

See:
http://sunset.usc.edu/research/WINWIN/index.html





example:
layered architecture:
+ changeability
- response time

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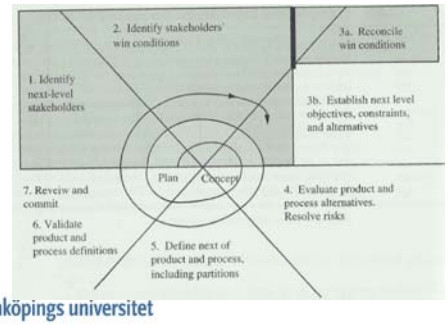
The win-win spiral model



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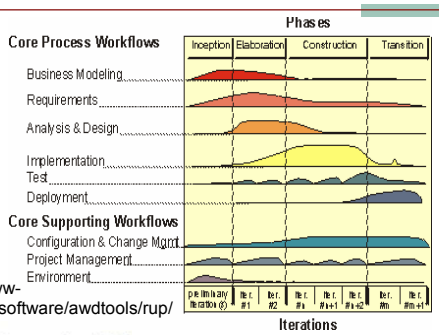
RUP – Rational Unified Process



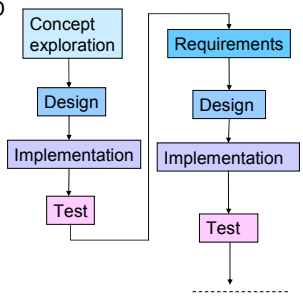
See: http://www-306.ibm.com/software/awdtools/rup/

Prototypig

- Sometimes called RAD (Rapid Application Development)
- Focus on feed-back

Negative:

- too early commitment
- hard to obtain quality?



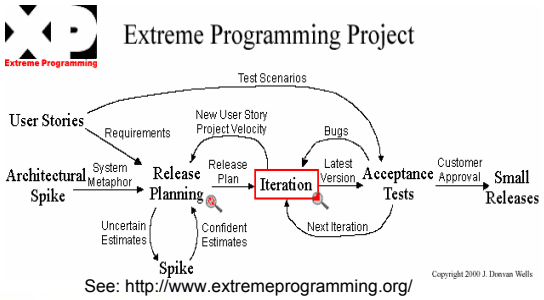
Synchronise and Stabilise

- Idea: to always be prepared to deliver
- Incremental method
- Frequent increment installation and test
  - Daily Build
- Smoke tests
- Regression testing
- The MS way

Cleanroom process model

- Incremental method
- Committed to formal specification
- Dedicated use of ETVXM
- Usage-based verification

eXtreme Programming



See: http://www.extremeprogramming.org/

Some XP-rules

- User stories are written
- Make frequent small releases
- Move people around
- Simplicity
- Choose a system metaphor
- Create spike solutions to reduce risk
- Refactor whenever and wherever possible
- The customer is always available
- Code the unit test first
- All production code is pair programmed
- Leave optimisation till last
- No overtime
- All code must pass all unit tests before it can be released
- Acceptance tests are run often and the score is published.

Open source

- The code is published
- An interested community voluntarily evolves the code
- All results are free to use
- Success #1: Linux
- ”Software culture”