Dinosaur meets Archaeopteryx?

Seven Theses on Rational's Unified Process (RUP)

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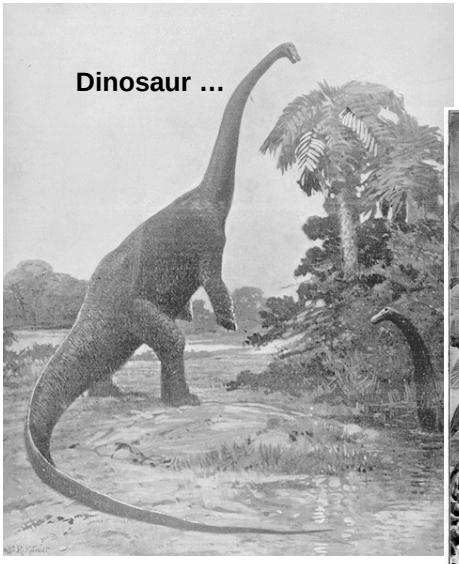
Dinosaur ...



meets ...

Archaeopteryx (?)

Seven theses on the RUP

Thesis 1: The RUP is still too much "waterfall"-like.

Thesis 2: The RUP is not architecture-centric enough

Thesis 3: RUP iterations should be attached to building blocks - rather than to phases

Thesis 4: RUP workflows (now: disciplines) are unnecessarily complex. The (formerly) so-called "core workflows" are just activity categories.

Thesis 5: The RUP ignores most powerful mechanisms for mastering complexity such as hierarchy, recursion and orthogonality

Thesis 6: The RUP does not appropriately support management. Its milestone concept is too weak.

Thesis 7: The RUP does not satisfactorily address the various groups and roles in the software process, in particular the user role.

Claims and core elements of the RUP

Claims

- *use case driven*
- *architecture centric*
- *iterative and incremental*

Core elements:

- Phases
- Iterations
- Core workflows

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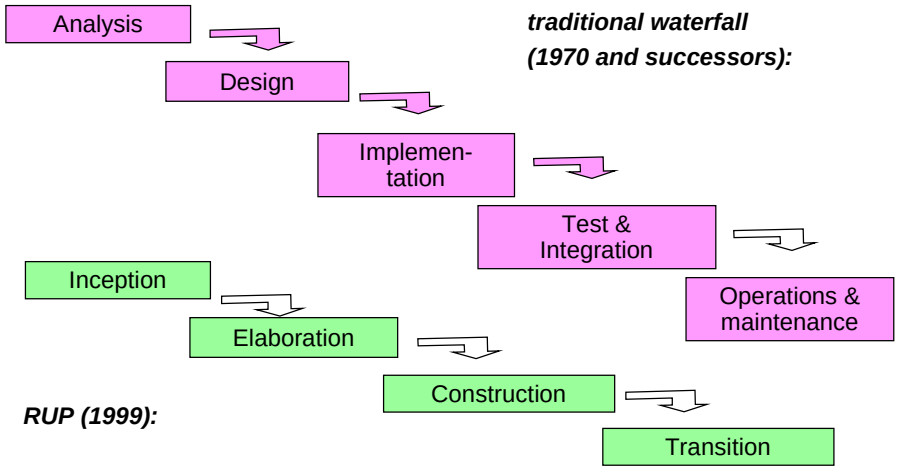
Thesis 1: ***The RUP is based on a phase oriented software life cycle model which is no longer adequate to support most contemporary development approaches.***



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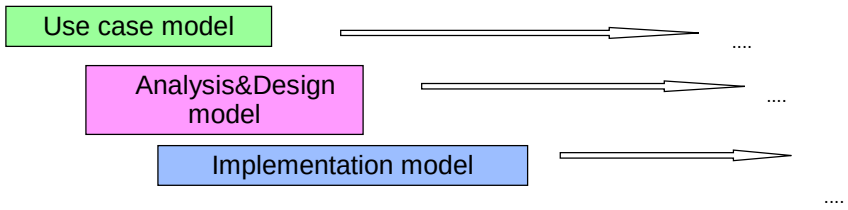
Do phases offer an adequate process structure?

- Benefits and problems of ***phases*** have been debated for long time.
- Contemporary software processes are highly ***complex***, ***differentiated*** and ***multi-faceted***.
- They consist of many, heterogeneous ***sub-processes*** typically running in parallel. Synchronisation of sub-processes should not be not phase-controlled but ***demand-controlled***.
- Phases offer just a superficial, rough and ***uppermost-level*** structure.
- Complex systems are organised in hierarchies and self-resembling sub-structures. Why don't we organise the corresponding processes in an analogous way?

What is needed now - is not new names for old phases, but other, ***more differentiated, systematic and appropriate*** process structures and synchronisation mechanisms.

Thesis 2: ***In contrast to its authors' claims, RUP is not an "architecture centric" process but it is still dominated by phase structure.***

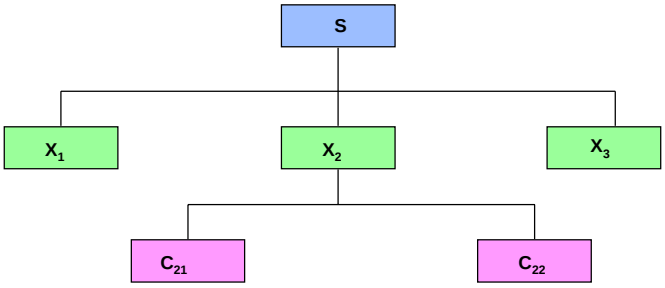
RUP "architecture":



If we take the OO paradigm serious ...

.. the three "models" should merely embody three ***states*** of ***one and the same*** model.

A simple but powerful architecture



S: System
X_i : Components
C_{ij} : Classes

- **Transaction-oriented process** (RUP et al.)

  Activities aim at refining the models.

Alternative:

- **Document-oriented process** (Ref.: Denert [Den 93]):

  Activities lead to defined results (*documents, building blocks)* which are developed (relatively) independent from each other and then integrated.

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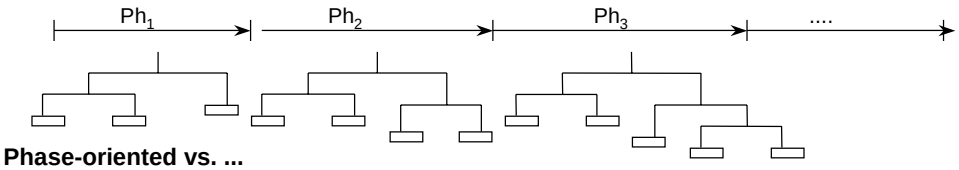
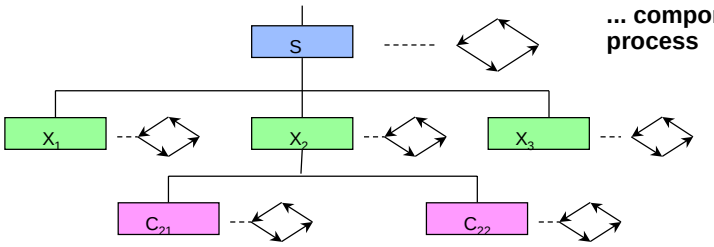
Thesis 3: ***The RUP does well in introducing iterations in the software development process, but there is much less need for phase iterations than for (sub-) product development cycles.***



Phase-oriented vs. ...



... component-oriented process

Legend:

Building block

Phase or activity

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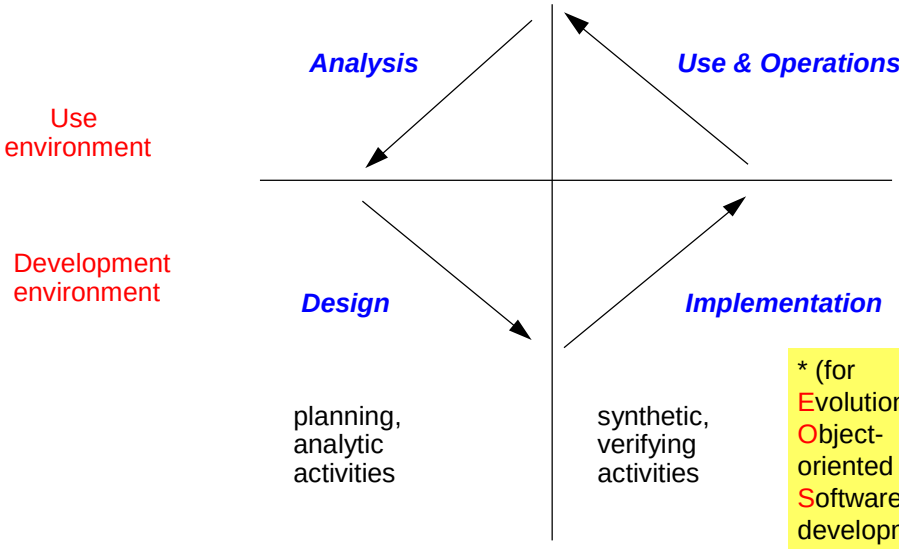
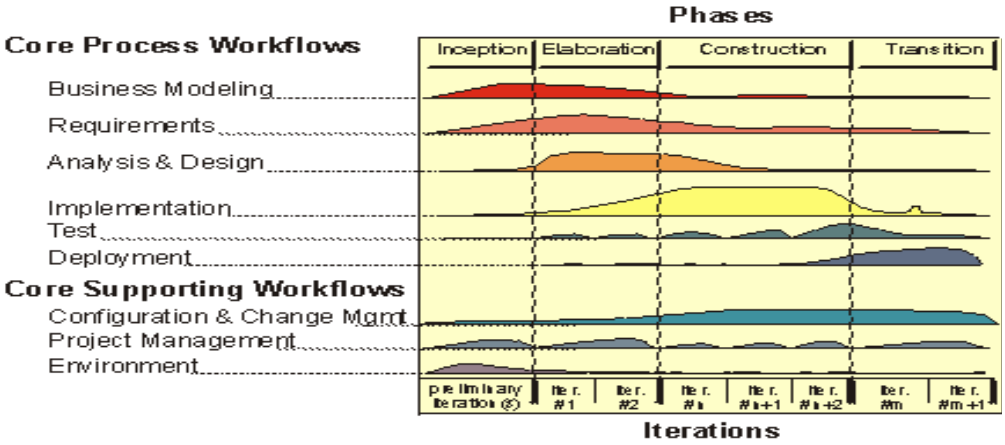
Activities of a development cycle in the EOS* model



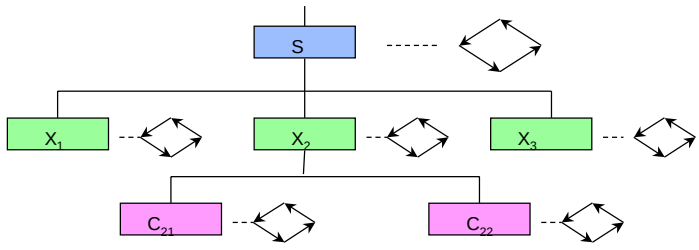
* (for Evolutionary, Object-oriented Software development)

Thesis 4: ***The RUP concept of workflows - now called "disciplines" - adds unnecessary complexity to the process.***



The former "core workflows" are misnamed and just activities of the same or a similar kind. They overlap with phases in a confusing way and do not contribute to a clear, transparent process structure.

Thesis 5: ***The RUP does not offer appropriate support for structuring complex software processes. It ignores most powerful mechanisms of computer science for mastering complexity: hierarchy, recursion and orthogonality.***



Orthogonal system & process structure

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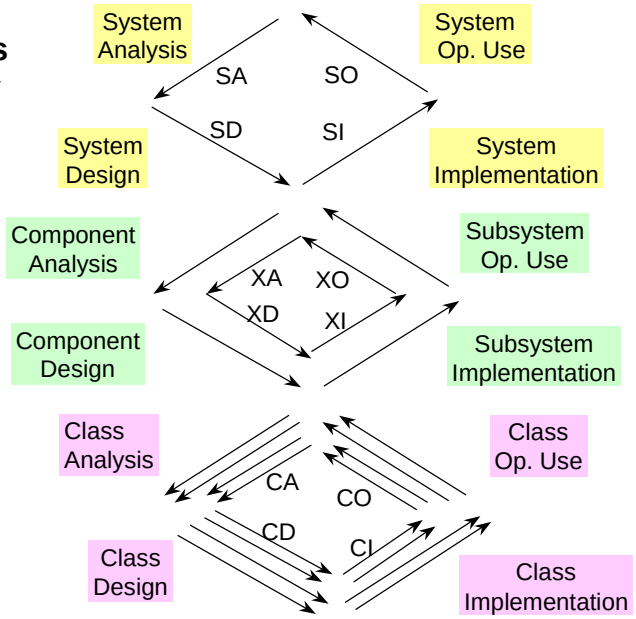
Combining development cycles in a traditional way



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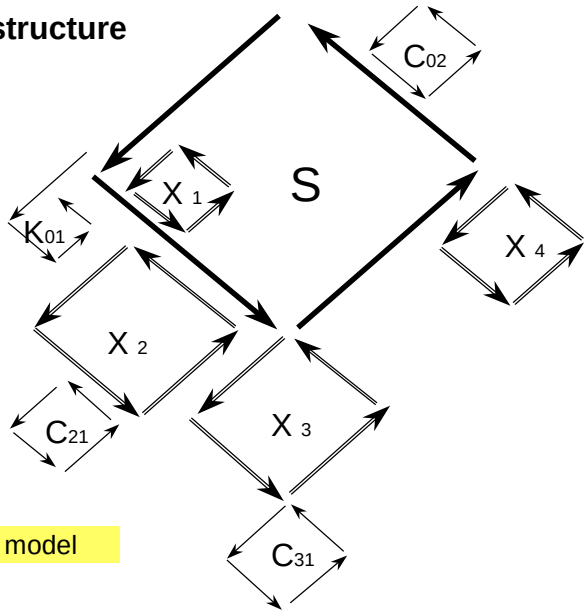
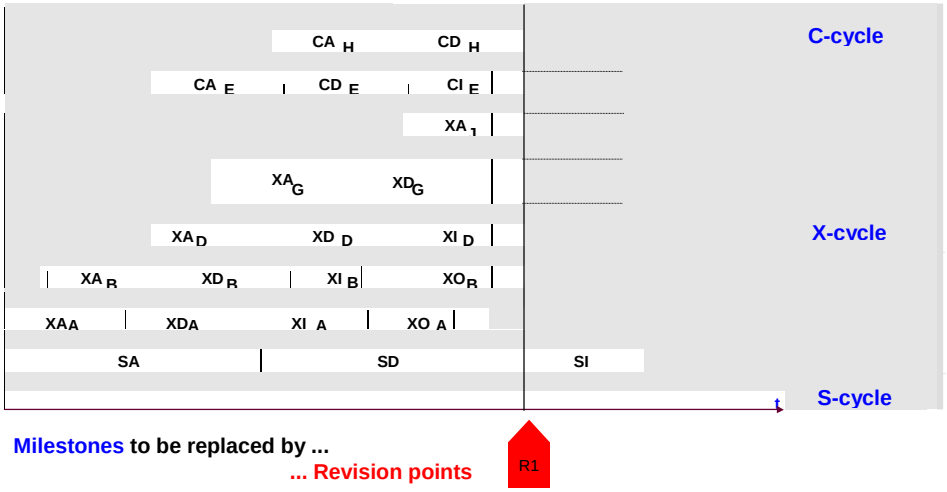
A "fractal" process structure



.. as proposed in the EOS model

Thesis 6: ***Due to its lack of transparency and structural flexibility, the RUP does not appropriately support management - in particular that of large projects. The RUP concept of milestones is too weak for complex coordination tasks.***

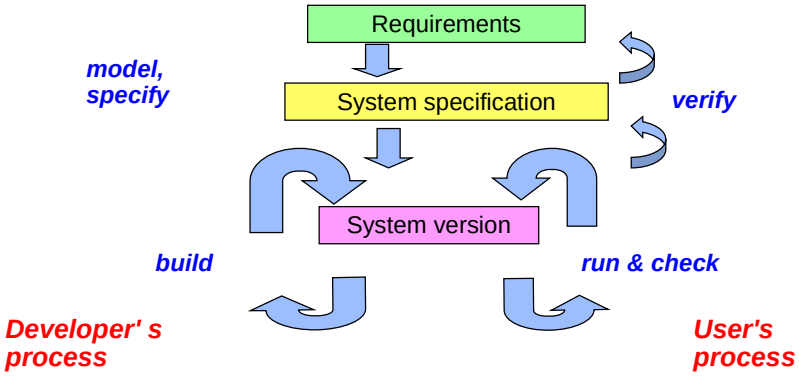


Milestones to be replaced by ...

... Revision points

Thesis 7: ***The RUP does not satisfactorily address the roles and interactions of various groups concerned with the software process, in particular the role of the users and their feedback on the process is neglected.***

Cf. the STEPS model (Floyd et al. 1989): Co-operation of developers and users



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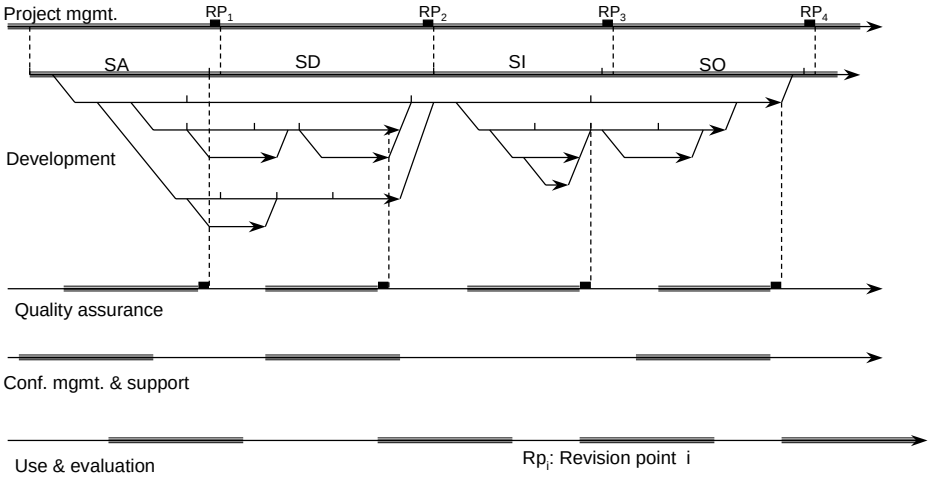
A general process model



SA: System analysis
SD: System design
SI: System implementation
SO: System operations & use

Reference: [Hes 97b]

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Summary and outlook

RUP: is principally a respectable approach to bring order into the jungle of OO process models

But:

- Approach is too traditional
- RUP is transaction-oriented instead of result-oriented
- Components (and their development) are not given adequate attention
- Use-case driven and incremental development is considered "the only way"
- "Unification" of processes is problematic - in particular when the habits and practices of people are touched

More promising (?):

"Multi-variant approach" based on a "toolbox" of standard activities, result types, roles etc. (cf. [H-N 99])

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