

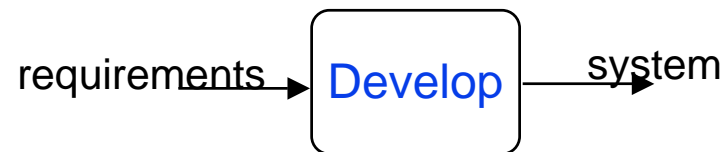
Applying activity theory in developing a framework for understanding and guiding systems development in product development context

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Main points of my paper

- To be able to use activity theory productively one needs to understand the philosophy behind it, too (or at least it helps).
- What is “wrong” with systems development? Systems development is decontextualized.
 - Cf. besides practice applies often to research, too
- Obvious solution in “rescuing” systems development: (Re)contextualizing systems development.
- Dialectics as the emerging substance of systems development thinking (cf. dialectics as the emerging substance of scientific thinking (Engeström 1990, p. 49))
 - Emergence of iterative/incremental, agile, ... (or all against waterfall/phased) software development movements are manifestations of this?

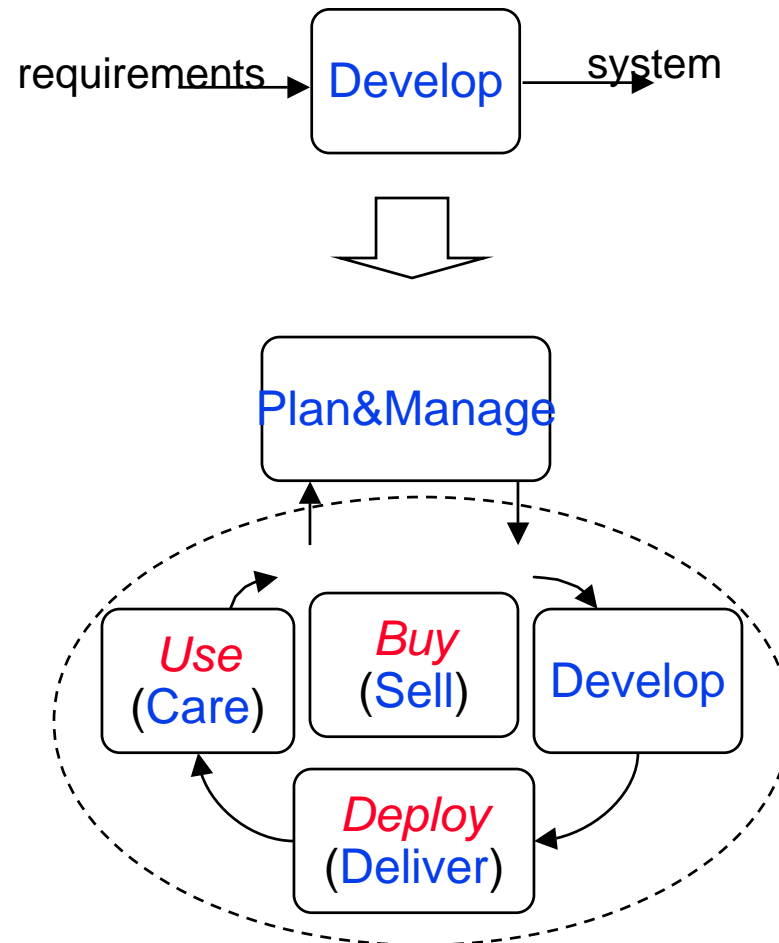
Prototypical view of systems development



Manifestation of input-process-output thinking

Problem: Decontextualization (for example, where do requirements come from)

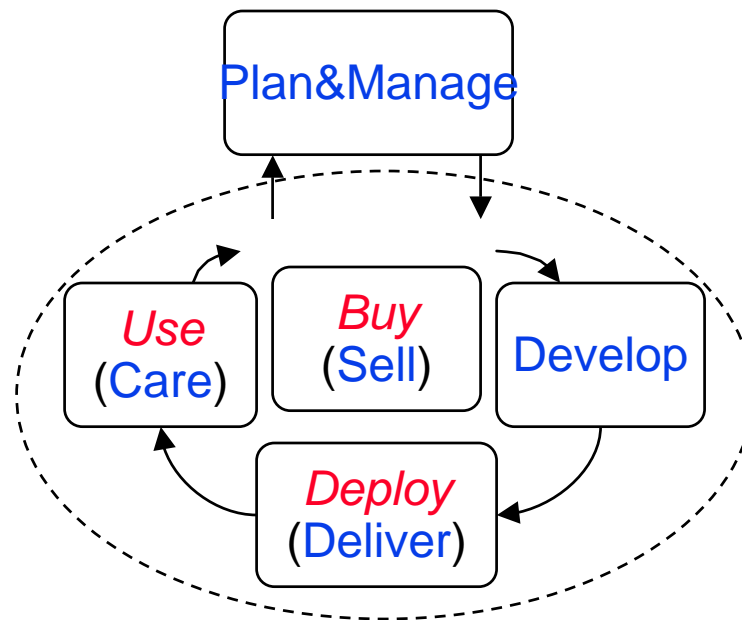
Contextualizing systems development in product development context



Legend
Red Customer activities
Blue Supplier activities

Expansionism instead of (or before) reductionism
as the methodological guideline

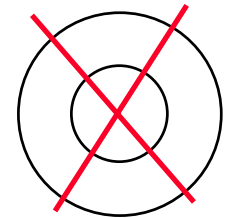
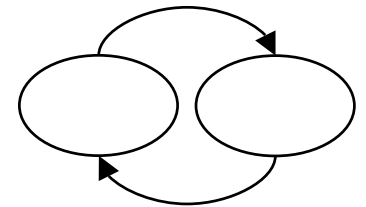
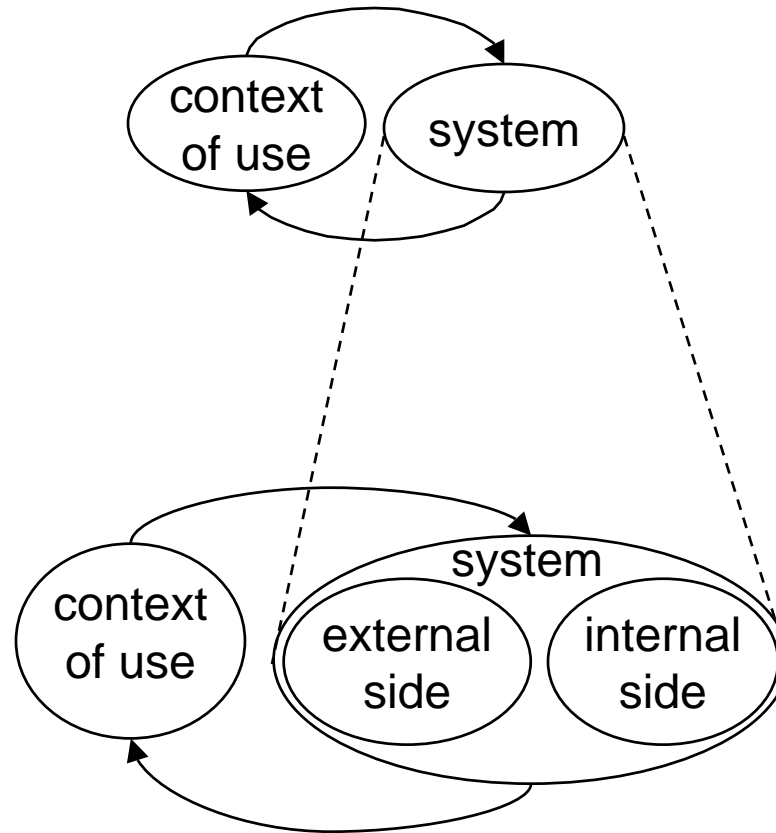
Model of the contexts of a system



All these contexts are sources of requirements, context of use the most important one.

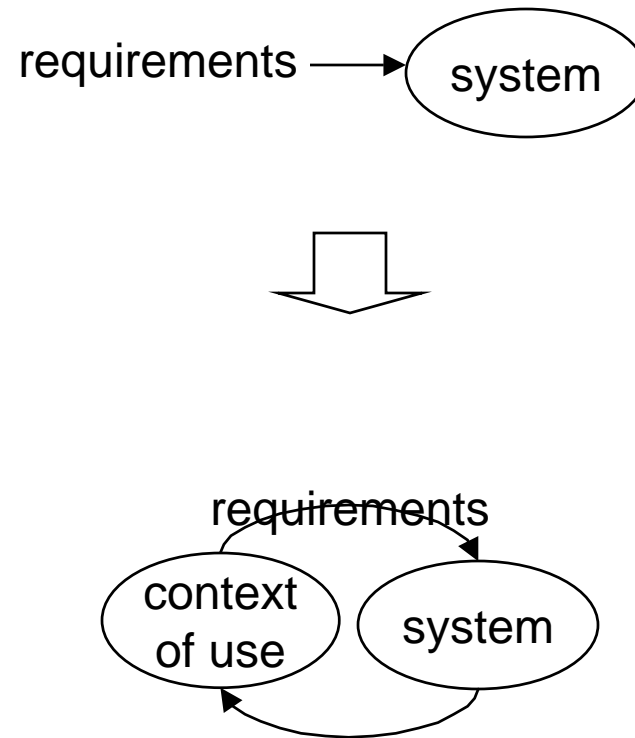
Besides the system itself, its Buy/Sell, Deploy/Deliver and Use/Care capabilities need to be developed in Develop (and planned in Plan).

Model of the object of systems development



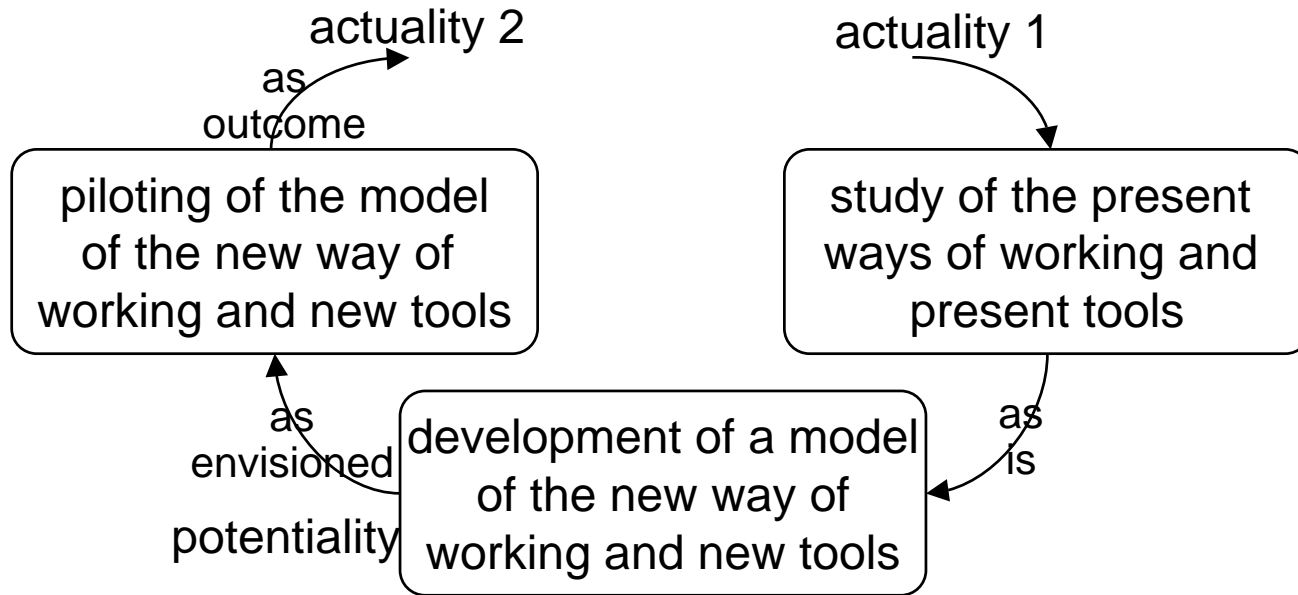
Starting point: Object instead of process
Context as a relation rather than as a container

Object of systems development reconsidered: System -> system in its context of use



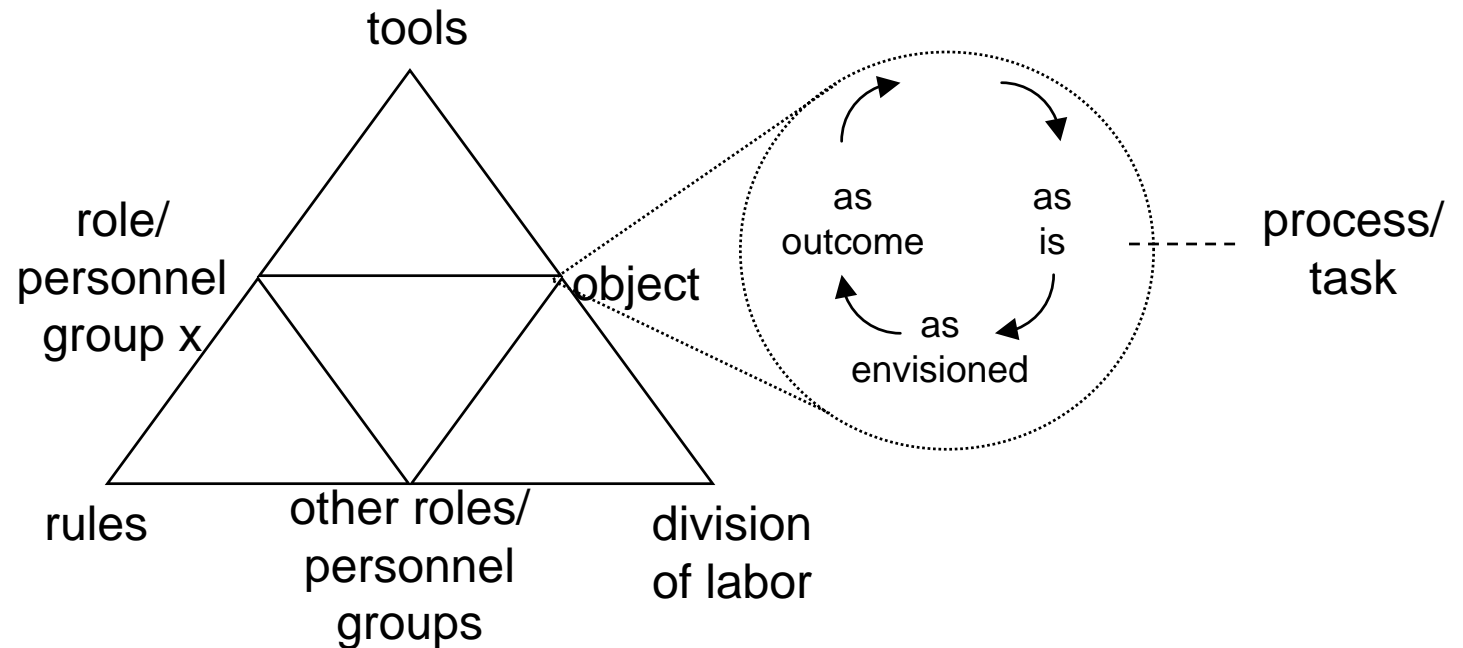
Contextualization of the system

Model of the process of systems development

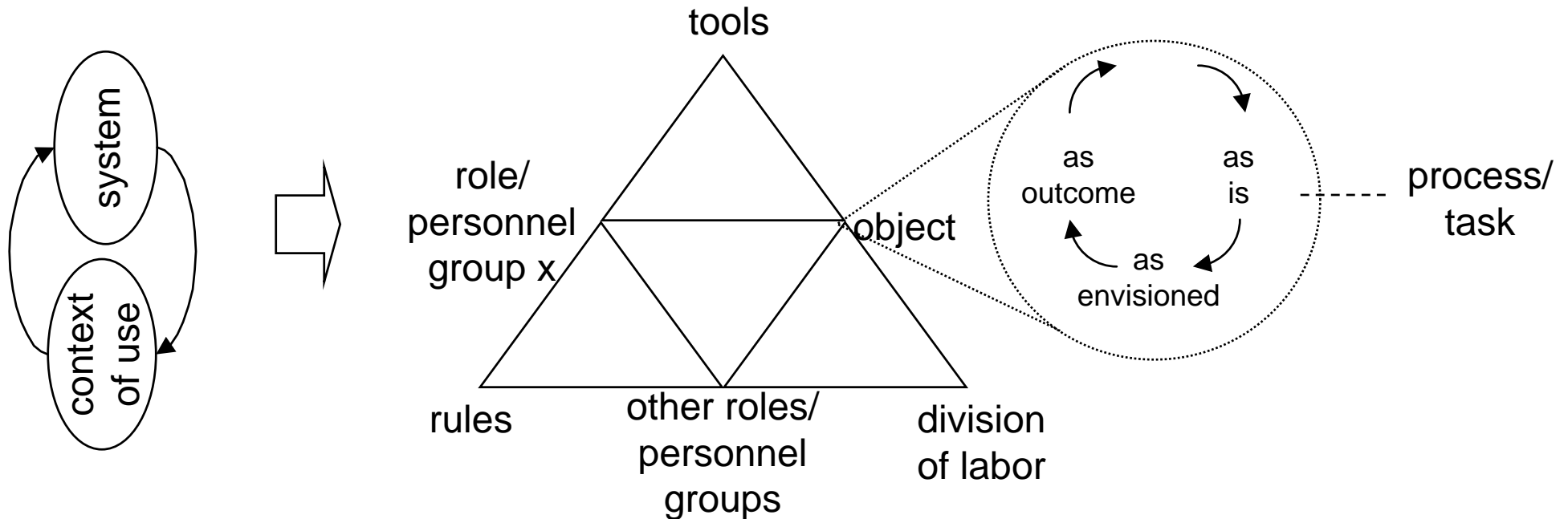


Law of the negation of negation in action
(actuality 1 -> potentiality -> actuality 2)

Model of the structure of systems development



Engeström's model of the structure of a human activity system as an expansion of my model of the object of systems development



Similarities/differences with others' positions/papers 1(3)

- General
 - AT as an end/object or as a means/tool?
 - AT-informed (Mwanza) vs. AT-based (de Souza)
 - AT provides conceptual tools for understanding some aspects of systems development. However, other conceptual tools are needed, too.
- Mwanza
 - Which concepts of AT to focus on?
 - What about concepts behind AT, too, i.e., categories and laws of dialectics?
 - Mapping theory onto design
 - AT's emphasis on historical analysis vs. systems development's need to envision future: What is the problem here? Both aspects are built-in in AT, at least in developmental work research.
 - What parts of systems development process to focus on?
 - Requirements part. What level of analysis? High-level, for getting preliminarily grasp of the context of use. Cf. AT diagrams vs. use case digrams (de Souza, Korpela).
 - However, link to implementation part extremely important. It seems that software engineering research tradition influences systems development practice most. -> If one wants to influence practice the argumentation needs to be developed starting from prevailing thinking in that tradition.

Similarities/differences with others' positions/papers 2(3)

- de Souza
 - Components of a methodology (Rumbaugh)
 - Set of modeling concepts (used for making models of the object of systems development)
 - Set of notations and views (difficult to make a distinction between this and previous one?)
 - Development process (is a model of the systems development activity system itself)
 - Collection of hints and rules-of-thumb
 - What of these does AT provide?
 - de Souza: Modeling concepts/yes, notations/yes, the rest/not clearly. Mwanza: Development process + additional notation. Korpela: Only development process implicitly.
 - My interpretation of the components of a systems development methodology (following AT)
 - Structure of systems development (activity system)
 - Process of systems development (corresponds with development process above)
 - Object of systems development (tools are used to transform the object)
 - Tools of systems development (correspond with modeling concepts and notations as well as hints and rules-of-thumb above; model of development process is a tool, too)
 - Object of an activity system in AT vs. object-oriented analysis in software engineering: Object in a different sense?

Similarities/differences with others' positions/papers 3(3)

- Korpela&Mursu
 - Use of use cases in representing an action within activity: Agree.
 - Need to combine HCI, CSCW and IS perspectives in systems development: Agree. At least software engineering perspective should still be added to this list.

Three propositions/comments/questions for discussion

1. To be able to use activity theory productively one needs to understand the philosophy behind it, too (or at least it helps). Has this received enough attention?
2. There are different types of development contexts: Has this received enough attention (besides Grudin)?
 - For example, prevailing requirements related terminology comes primarily from contract development context.
3. Research related to systems development is done in many academic disciplines/fields focusing on its different aspects
 - Computer sciences: Computer supported cooperative work, human-computer interaction, information systems, software engineering (and its subdisciplines like requirements engineering), ...
 - Business sciences: Marketing (new product development), ...
 - Human and social sciences: Education (e.g., developmental work research), ...

Research is discipline-oriented rather than problem-oriented and not many are doing synthetic/comparative research (yes, there are researchers who contribute to many disciplines, too). From practitioner viewpoint this is unfortunate because practitioners are then forced to do the “synthetic/comparative research”.