Gaming for Evaluation

Games with a high simulation component

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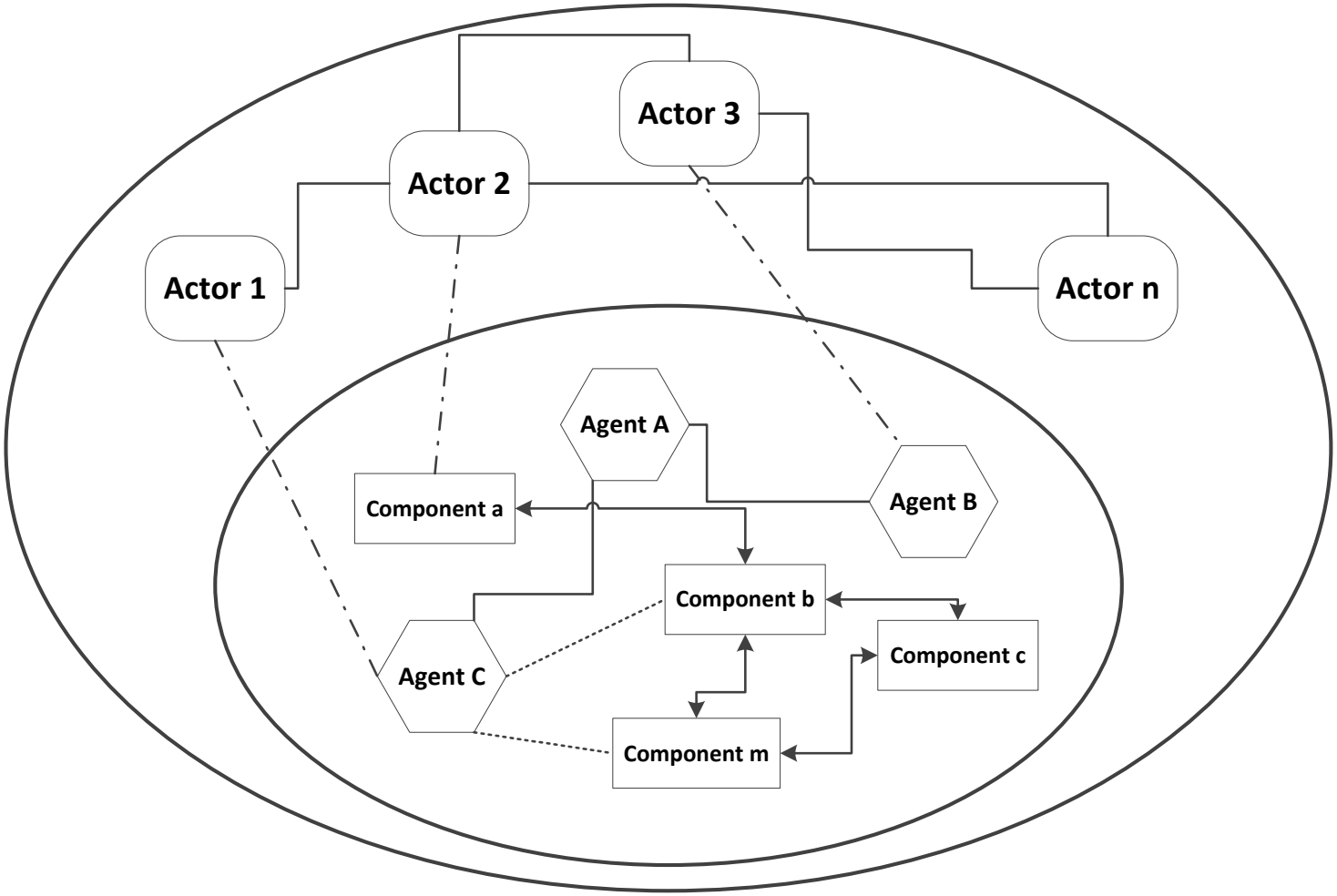
Complex Adaptive and Sociotechnical



Two extremes of complexity

Technical-physical complexity	**Socio-political complexity**
Many interdependent 'variables' (system complexity)	Many interdependent loosely coupled stakeholders (policy network)
Cognitive uncertainty	Disputed knowledge, values & norms
Design phases (steps, structure)	Dynamic rounds and arena's (fluidity)
'Best' solution, best available knowledge	'Accepted' solution, Negotiated knowledge
Hard tools: simulation, models, DSS	Soft tools: participation, process management

A game, or a simulation?

Real world systems design is dependent on models that represent REALITY

But is that:

1. Fidelity?
2. Realism?
3. Specificity?

In many studies: assumption that (computer) simulation is essential for representing reality.

Designing a transportation system

ProRail: Dutch railway infrastructure manager
(Traffic control, but no train operator)

Major uncertainties in design of higher frequency time table

Role of operations
Complexity
Evaluation challenge

10 years research TU Delft

Gaming in Railway Traffic Control: System Level Design Evaluation with Operators

Traditional design in railway operations is top-down

- Testing in computer simulations
- Then push to *operations?*

But will it work in practice?

- Current robustness and resilience is already under pressure
- Engineering has many assumptions about the operations.
- The difference between theory and practice exists only in practice

Talking with operations doesn't help: do it with them!

- Reason is found in implicit, but very effective, mental models

40 experts playing new logistics!

ProtoWorld

Massive sources of (open) data on cities available

Creating games and simulations still very expensive

- Couple existing simulators
- Automatically generate environments
- Game layer for interactions of player-experts

- So far targeting transportation and security, but open platform: any spatiotemporal problem goes!
- Now in to-market phase.

Automatic generation of playable city

PROTO WORLD

gamifying urban & transport planning

Some use cases: FP7 PETRA

PETRA project (EU FP7 RIA)

Generating a city-owned next-generation travel planner

- Integration with control rooms
- Travel advise to implement city policies
  - Less crowding, faster travel, mitigate peaks
- From governance to data crunching
- Rome, Venice, Haifa

Experiences

Making operators game is not trivial

- Always challenging level of detail
- Spot easily difference between reality and simulation

- Very willing to express their expertise
- When rightly facilitated: accept imperfections in sim
- Formal test of design =not Klabbers-proof
- Sense-making, pluralistic assessment

- Debriefing essential!

Questions, participation?

Open source approach

- Attribute, share-alike (CC4.0)
- LGPL software licenses
- Github: SebastiaanMeijer/ProtoWorld

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