Overview on policy research tracks at SNE

DL4LD: kickoff meeting ArenA use case

27 February 2020

Giovanni Sileno (g.sileno@uva.nl)

>>> Complex Cyber Infrastructure (CCI) group
>> Systems and Networking (SNE) lab
> Informatics Institute (IvI)
University of Amsterdam (UvA)

General research question:

improve the
(digital) governance
of (digital) infrastructures

analysis / visualization

policy-making
interface for humans

automation

improve the (digital) governance of (digital) infrastructures

computational agents

reference of human agents

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“PolicyCAD”

analysis / visualization

policy-making
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“PolicyCAD”

for Secure and Trustworthy *Digital MarketPlaces (DMPs)*

analysis / visualization

policy-making
interface for humans

automation

improve the (digital) governance of (digital) infrastructures

computational agents

reference of human agents

“PolicyCAD”

for Secure and Trustworthy *Digital MarketPlaces (DMPs)*

= DATA-SHARING INFRASTRUCTURES

People & Projects

blockchain, financial sector

SSPDDP

Thomas

Lu-Chi

data logistics for logistics sector

DL4LD

Mostafa

Xin

VWDATA

Giovanni

EPI

Milen

consent-aware healthcare

INSIGHTS

Peter

quantitative analysis financial sector

People & Projects

Sara

Ameneh

Robert

Koen

DL4LD

Lu

Mostafa

Xin

SSPDDP

Lu-Chi

Thomas

VWDATA

Giovanni

EPI

Saba

Milen

Jamila

INSIGHTS

Peter

Sander

Tom

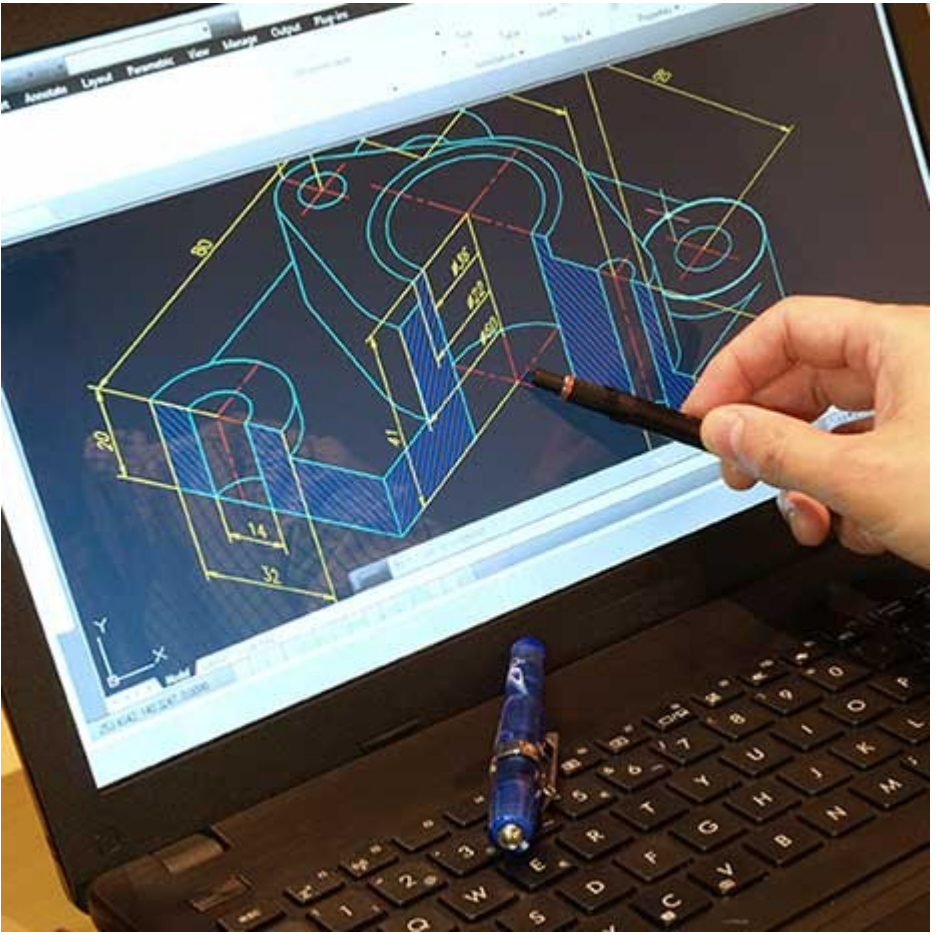
Adam

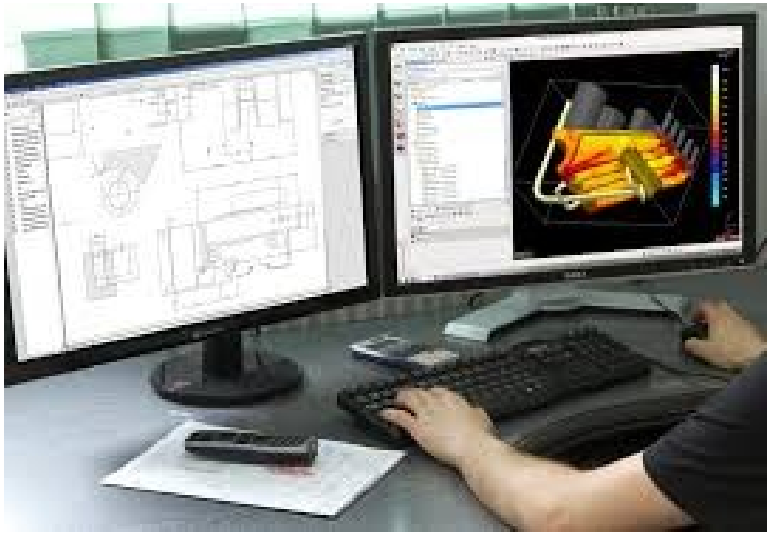
Cees

Paola

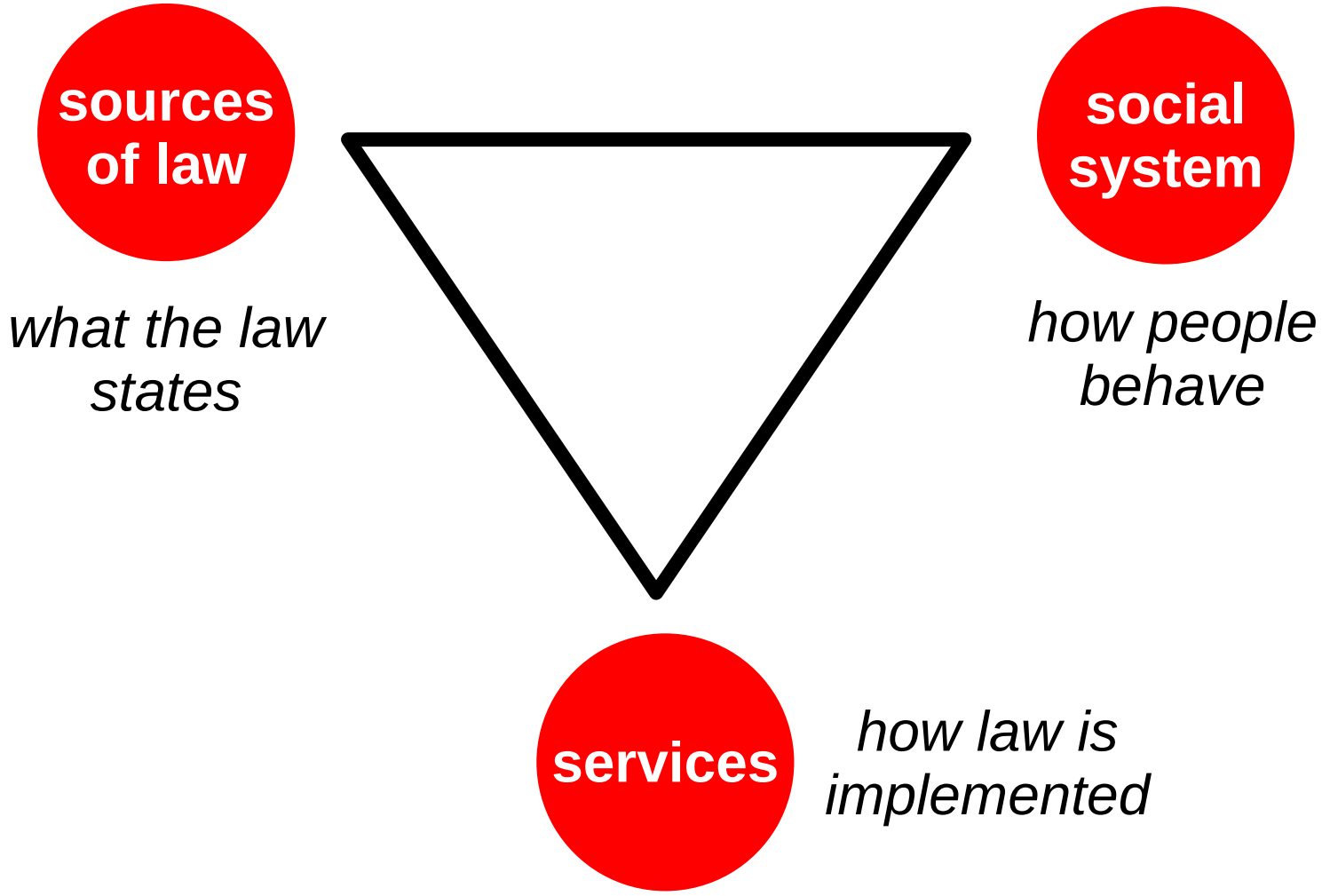
Leon

CAD = Computer-Aided Design

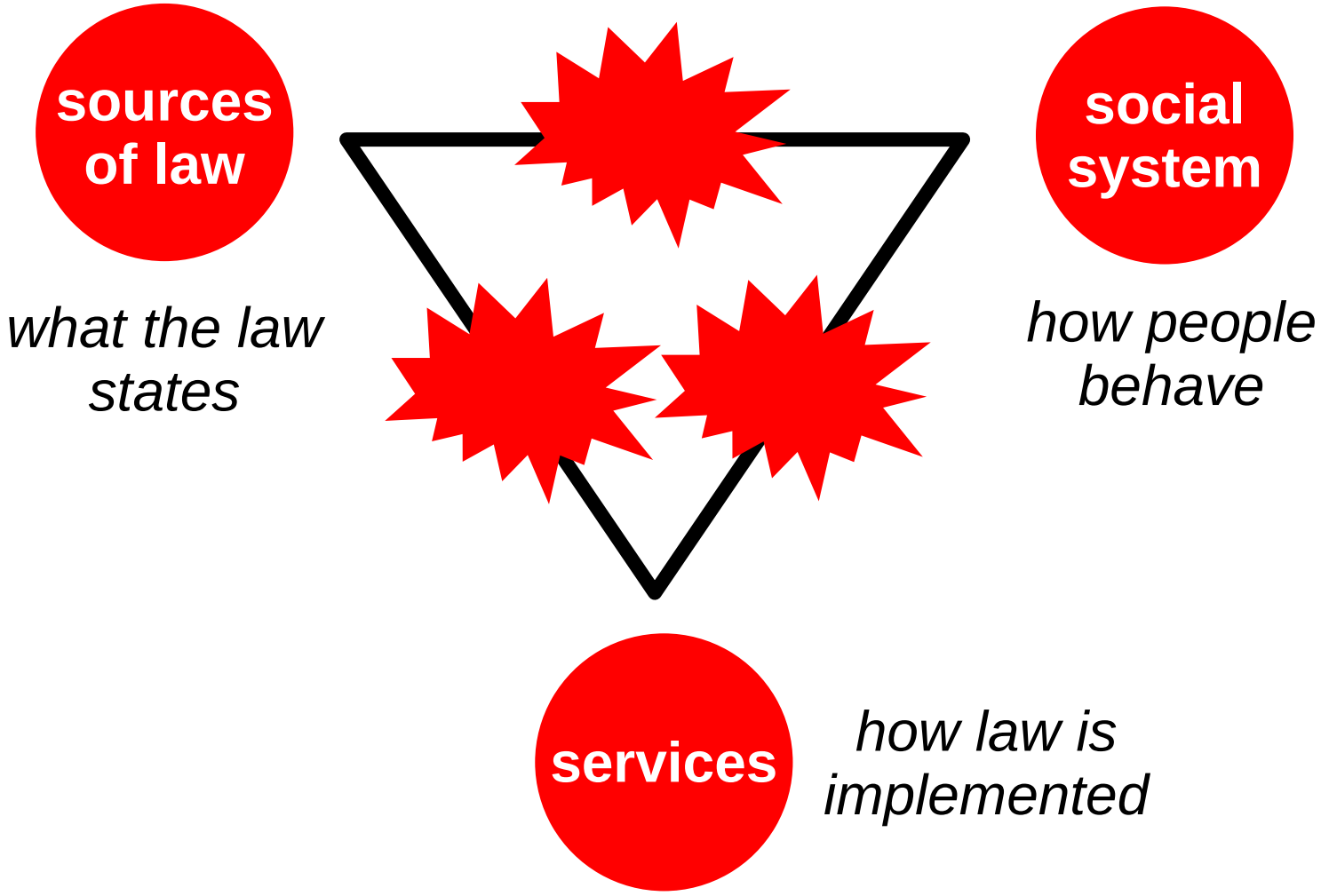




Is a CAD for policies even possible?


sources of law
social system
services
what the law states
how people behave
how law is implemented

Three frictioning “realities”



what the law states

how people behave

how law is implemented

*three matters only **loosely coupled!***

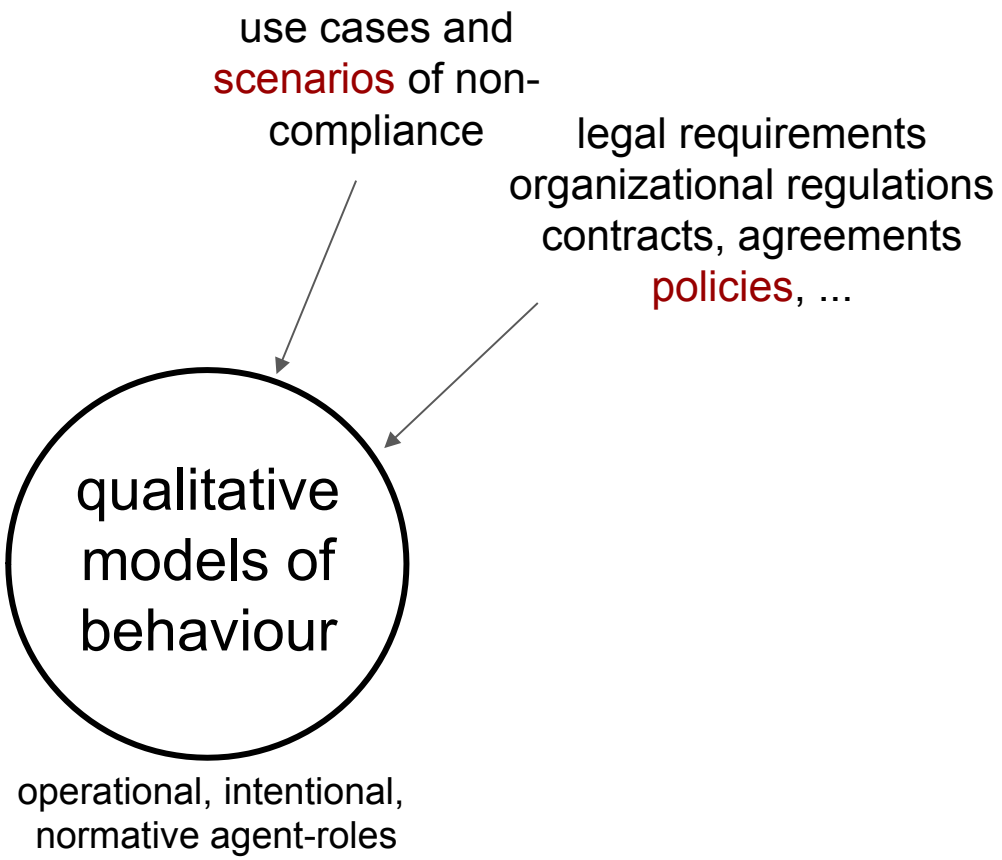
Main research tracks

- Computational mapping of norms and policies
- Application of norms and policies for offline **interpretation** (compliance checking) and policy **evaluation**
- Embedding of norms and policies for **operationalization** (online monitoring, authorization, etc.)

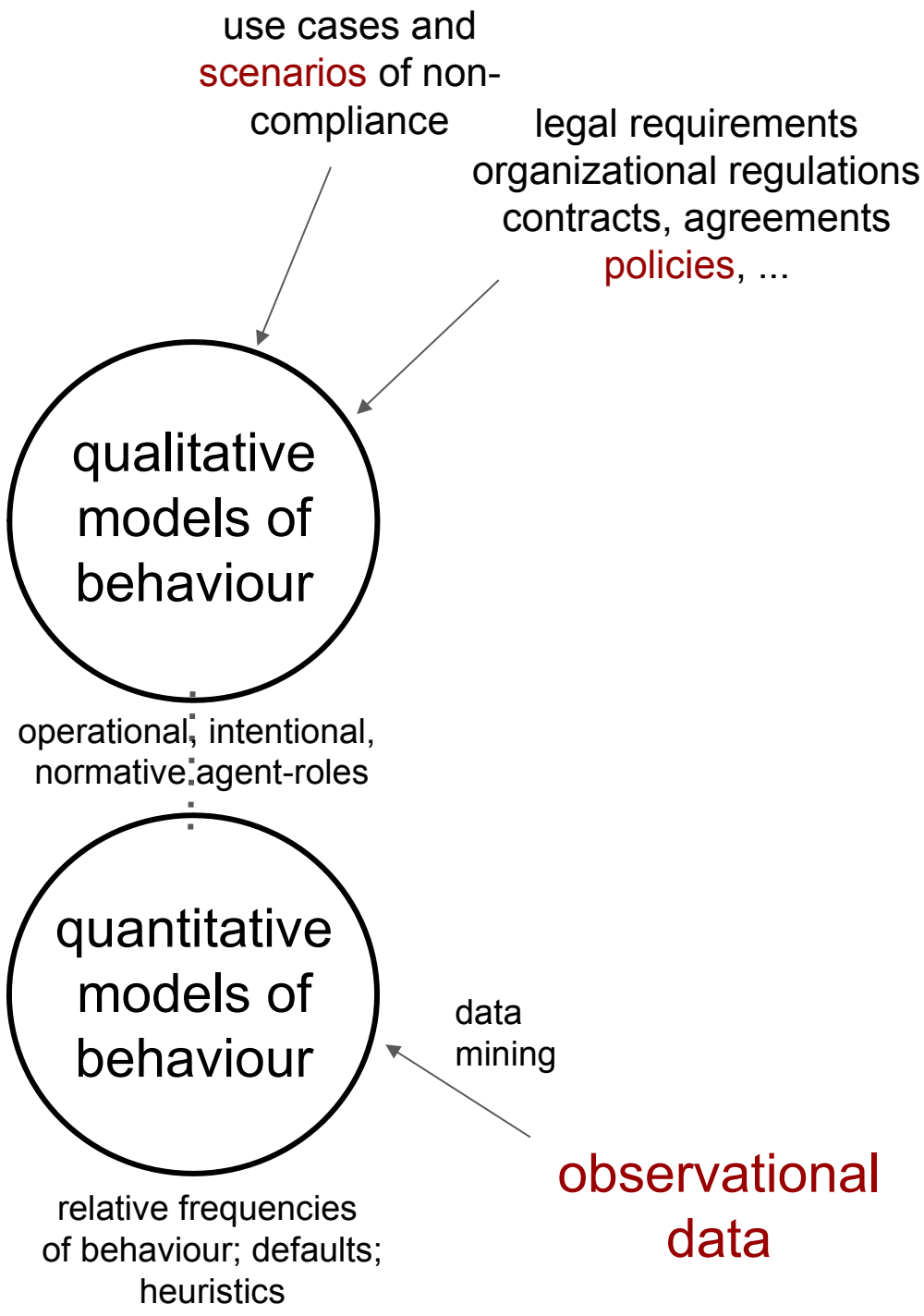
Policy-making aspects

- **SITUATEDNESS** policies are decided against existing social system and normative systems
- **DIRECTIVITY** policies are meant to maintain and promote certain drivers (within a certain socio-institutional asset)
- **IMPACT** policies (usually) have impact on the social system
- **RETROACTION** social and normative systems might push a change in policies

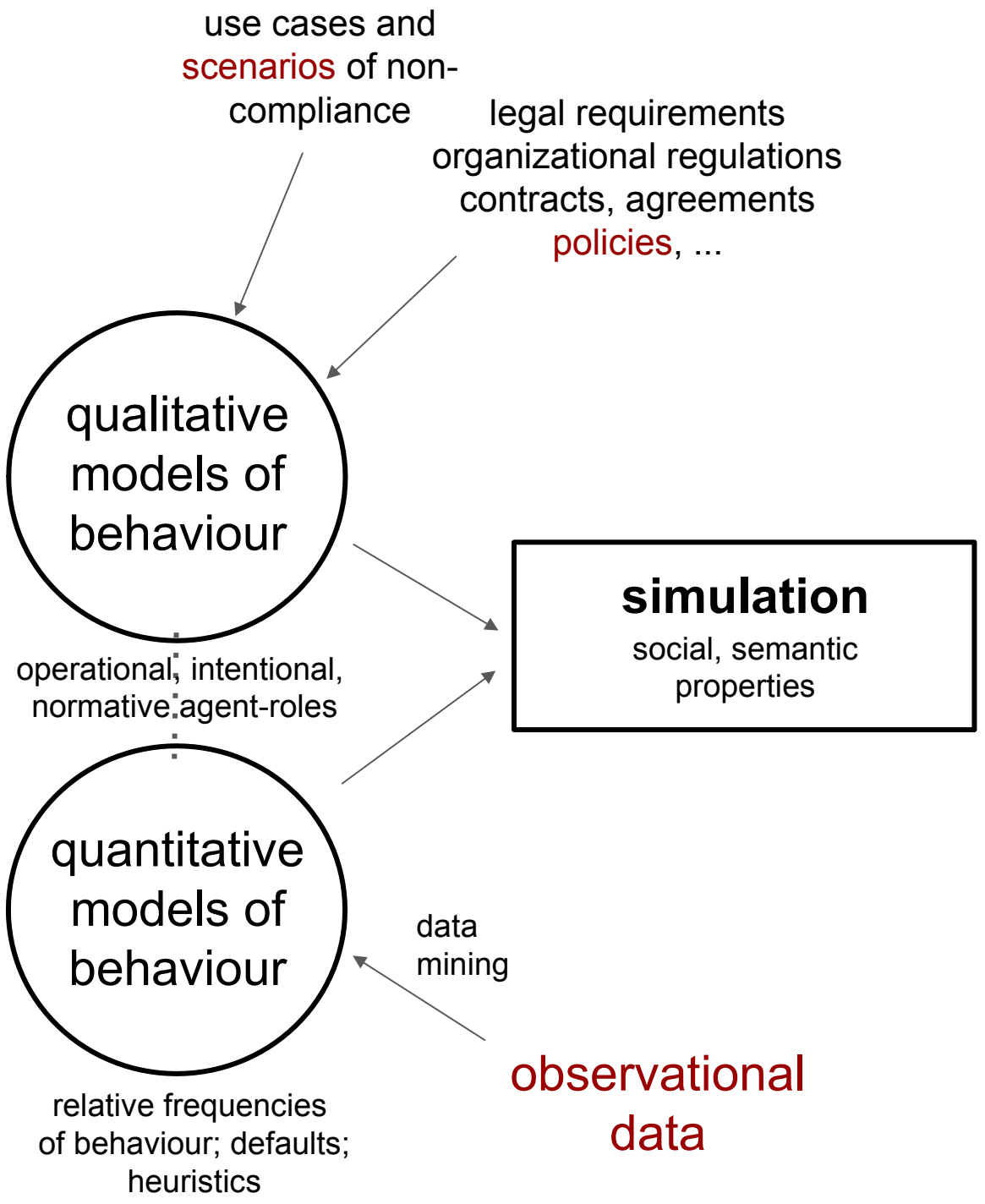
- **SITUATEDNESS**



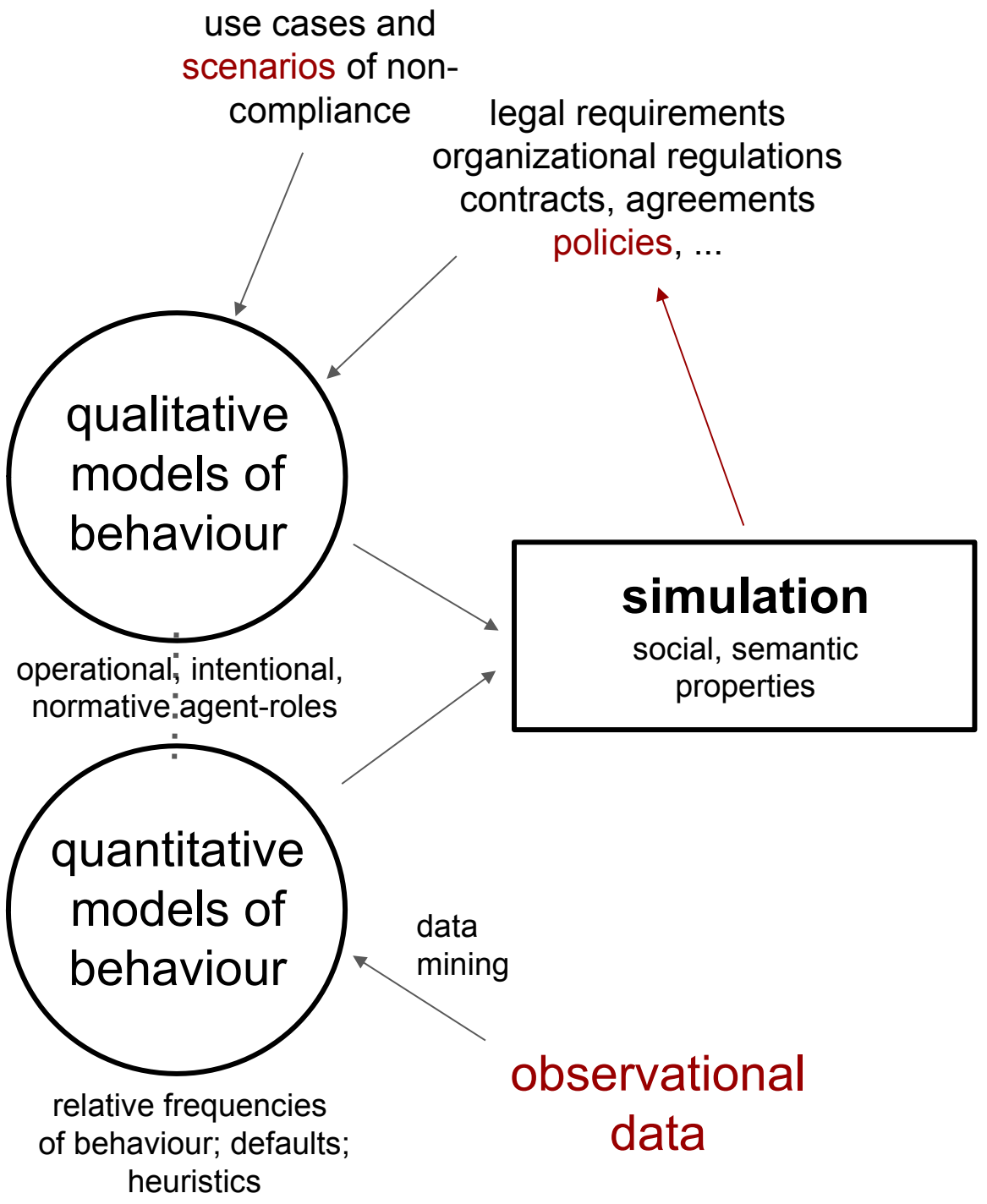
- **SITUATEDNESS**



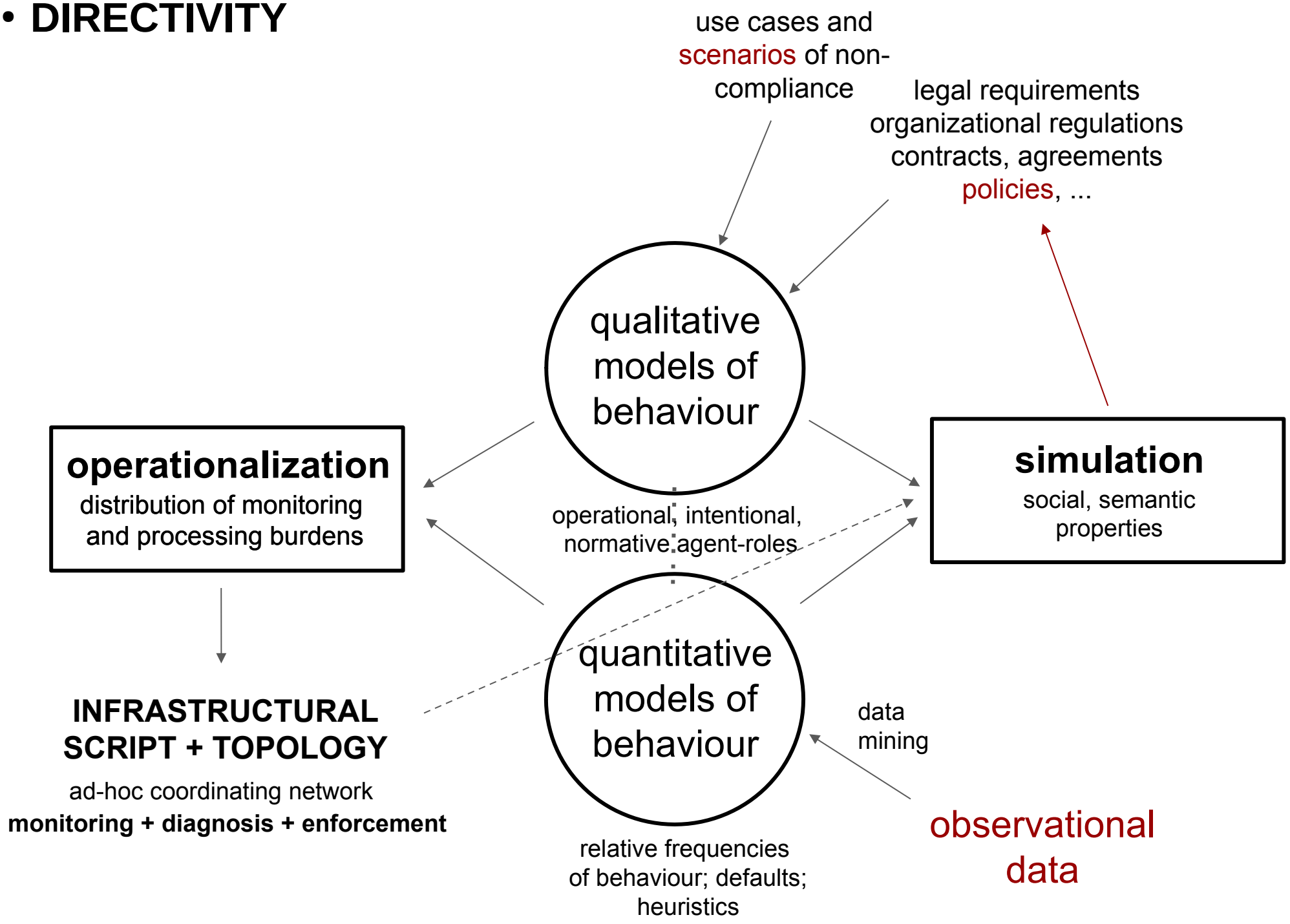
- **IMPACT**

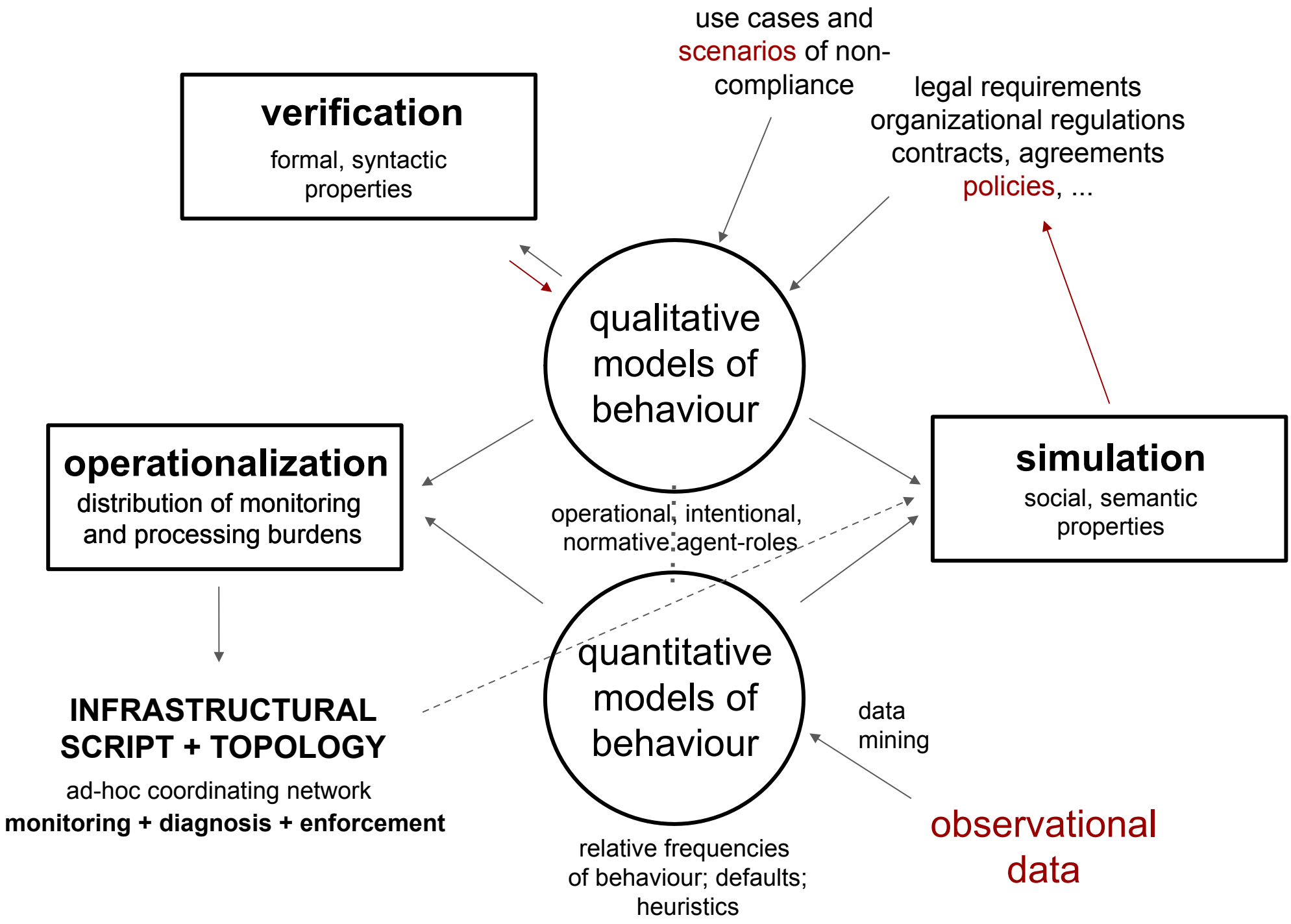

use cases and
scenarios of non-
compliance
legal requirements
organizational regulations
contracts, agreements
policies, ...
qualitative
models of
behaviour
operational, intentional,
normative agent-roles
simulation
social, semantic
properties
quantitative
models of
behaviour
data
mining
observational
data
relative frequencies
of behaviour; defaults;
heuristics

- **RETROACTION**

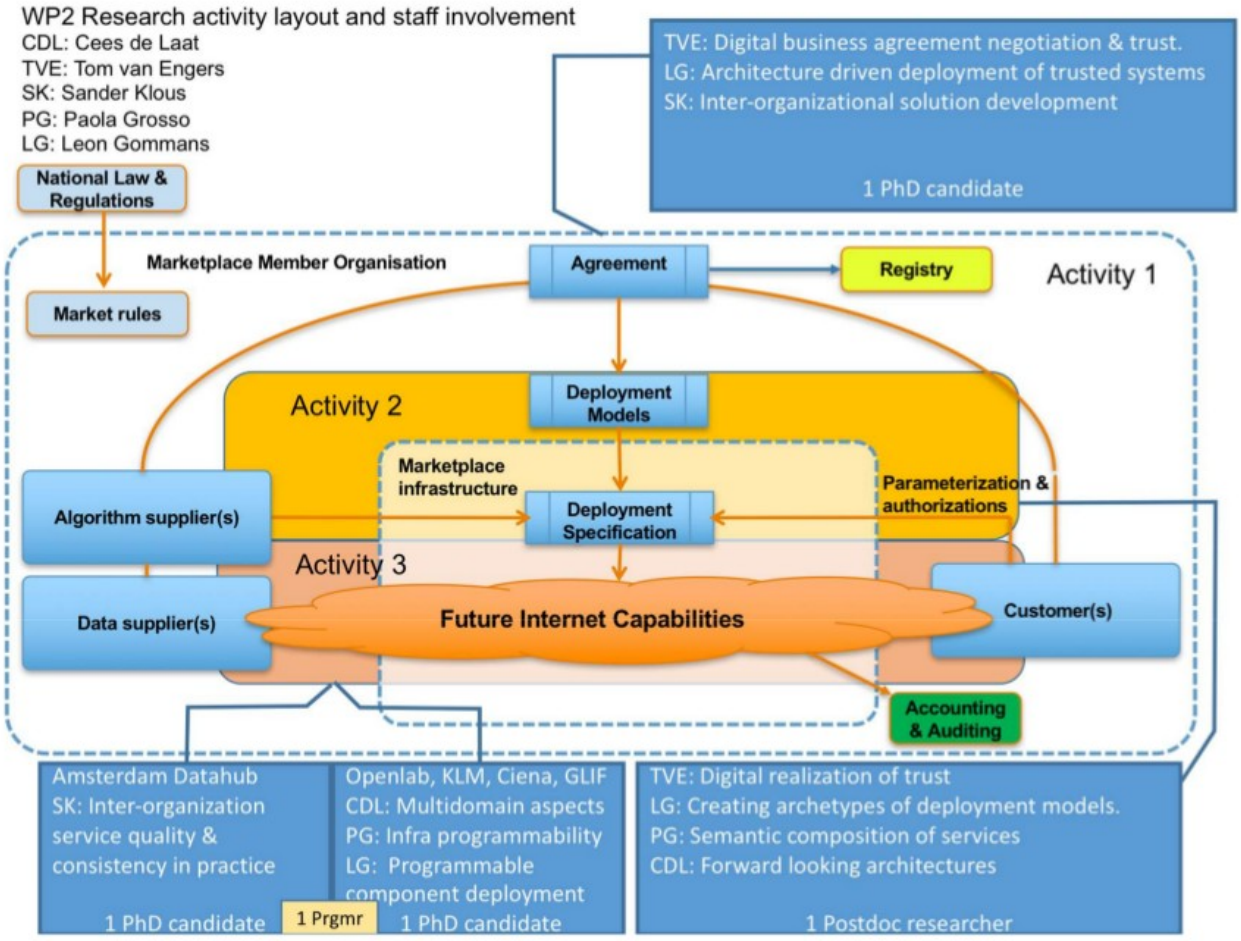


- **DIRECTIVITY**



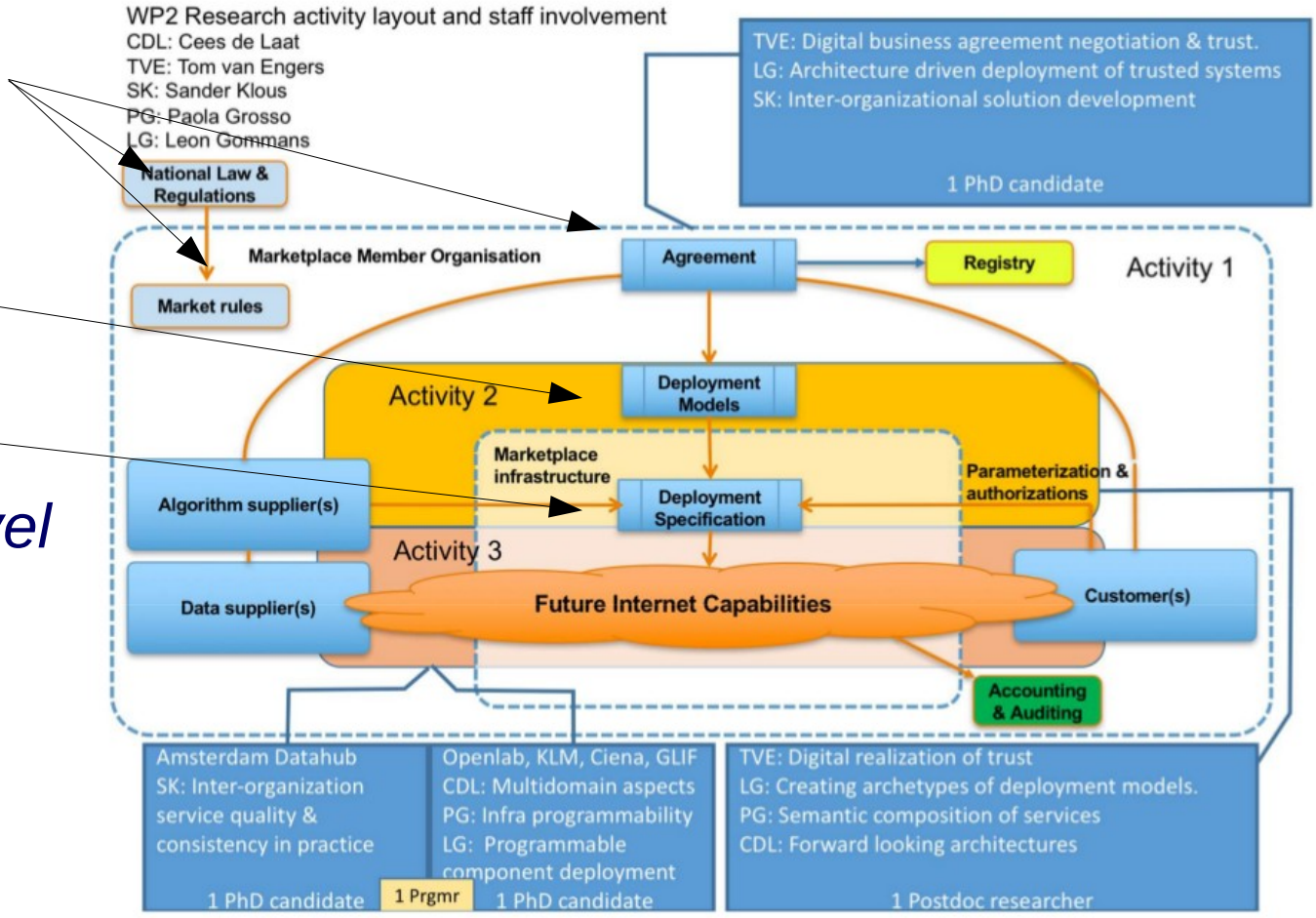

use cases and
scenarios of non-
compliance
legal requirements
organizational regulations
contracts, agreements
policies, ...
verification
formal, syntactic
properties
qualitative
models of
behaviour
operationalization
distribution of monitoring
and processing burdens
simulation
social, semantic
properties
operational, intentional,
normative agent-roles
quantitative
models of
behaviour
INFRASTRUCTURAL
SCRIPT + TOPOLOGY
ad-hoc coordinating network
monitoring + diagnosis + enforcement
data
mining
observational
data
relative frequencies
of behaviour; defaults;
heuristics

The DL4LD project



The DL4LD project

- The original proposal builds upon the classic 3-layers division:
  - Policy
    strategic level
  - Planning
    tactical level
  - Operations
    operational level



Amsterdam ArenA use case

- Critical aspect: *dynamic change of rules* (internal, e.g. caused by a change of GRIP level, or external, e.g. new norms)

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Policy considerations: e.g. specify and evaluate current policies (e.g. regulation concerning the GRIP levels), deciding upon which type of data **SHOULD** be available in which conditions, what kind of monitoring/enforcement should be put in place to satisfy certain risk requirements (e.g. auditors, etc.)

Planning considerations: e.g. model the (possibly conflicting) needs of the actors involved (including malicious ones), addressing informational and temporal aspects, and reaction to failures. Prototypical outcome of the analysis: e.g. certain data **WILL** be shared only if will be processed by a third party and for a specific purpose (to promote both common benefit and private interest).

Operations considerations: e.g. plans **ARE** put in action in the infrastructure, satisfying technological requirements of security, responsiveness, etc.

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A change in one of the policies usually requires an adaptation cycle in all the three levels!

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