Policy making environment

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Data-sharing infrastructural policies
Regulations, Policies, Agreements and Infrastructural Rules
How complex can be the design of infrastructural policies?

- Infrastructure adds a level of limitations and concerns.
- Not a very complex policy design and/or planning needed.
  Not so different than what we already have.
- All parties may have external agreement, contracts, internal limitations.
- Regulations add more limitations and concerns.
Levels of governance/guidance

- **Legal Norms**: Generally comes from outside sources
- **Policies/Plans**: Policies and plans of the system
- **Agreements/Contracts**: This comes from users/parties
- **Infrastructural policies**: This is what is actually executed

**Ideal situation:**
- All *rules of infrastructure* map to a higher level concept
- All *legal norms, Market regulations, agreements* are enforced in rules of infrastructure
Implementing a fully compliant infrastructure

Can we automate the process?
Automate the process?

• Challenges (to name a few):
  • Infrastructure often includes (implicit) enforcements
    • Technological limitation
  • Some policies are not enforceable by the any infrastructure
  • Some policies are too expensive to enforce at the infrastructural level
  • Some policies are less effective when enforced

Conclusion: No straightforward top-down (formal) approach, Needs an assisted Policy design *Cycle*
Computer-assisted infrastructure design

So what can we do?
Modeling and Simulation environment?

- My role in DL4LD: A Sim/Mod env to assist
- Environment: Executable model of real infrastructural policies
- Actors:
  - Agent based models
  - Have utilities/preferences
  - May be playing by the rules
  - May try whatever they can to have more utility

Model execution will create a trace of actions/states
Questions for the policy designer/maintainer

• Is the infrastructure complaint to regulations/policies?
• How effective and efficient are the (designed infrastructural) policies?
Is the infrastructure compliant?

- Is there contrast between regulations and states/actions in the simulation?
  - Illegal states happened?
  - Illegal actions performed?
How effective/efficient are the policies?

- Are incentives adequate to support the overall guidance structure?
  - Do actors prefer to be compliant?
- At which costs the overall system functions?
  - Network load, etc.
The full cycle

Implementing (new) policies

Infrastructure model execution

Trace analysis

Checking for contrast between trace and regulations

Checking for contrast between trace and preferences

Modifying the infrastructural policies

Modifying the real infrastructure

Analyzing the real infrastructure
Current work and focus

Shorter term (2020)

- Market Modeling/Simulation environment
- Agent scripting language

Longer term

- Agent based planning for data marketplace
- Adding ML capability to agent models
Thank you!
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