Simulating a SARNET Alliance Using ABM

Ameneh Deljoo (UvA), Leon Gommans (KLM), Ralph Koning (UvA)
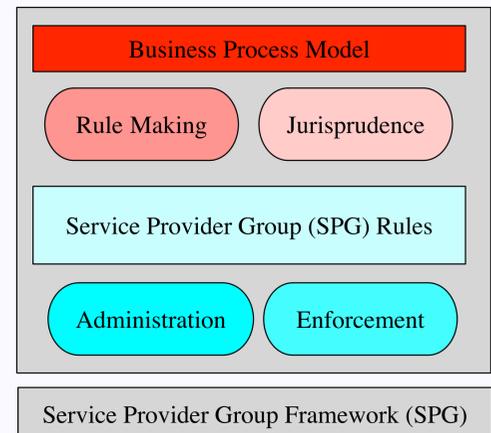Tom van Engers (UvA), Cees de Laat (UvA)

The **subject** of the SARNET alliance research is the value of **collaboration** between alliance members in terms of **risk reduction, cost benefits** and **revenue impact**.

Challenges

- Define a set of common rules to share intelligence and resources
- Organize and Maintenance Trust across a multi-domain collaboration
- Define Robust and Reliable trustworthiness estimators to quantify Trust

Approach

- A Service Provider Group (SPG) as a way to define common rules
- Create social computational Trust models to assess trustworthiness
- An ABM to research the impact of rules

Business Process Model

Rule Making | Jurisprudence

Service Provider Group (SPG) Rules

Administration | Enforcement

Service Provider Group Framework (SPG)

Determining Trustworthiness Estimator

In our research we identify two types of Trust

- Inter-personal Trust
- Inter-organizational Trust
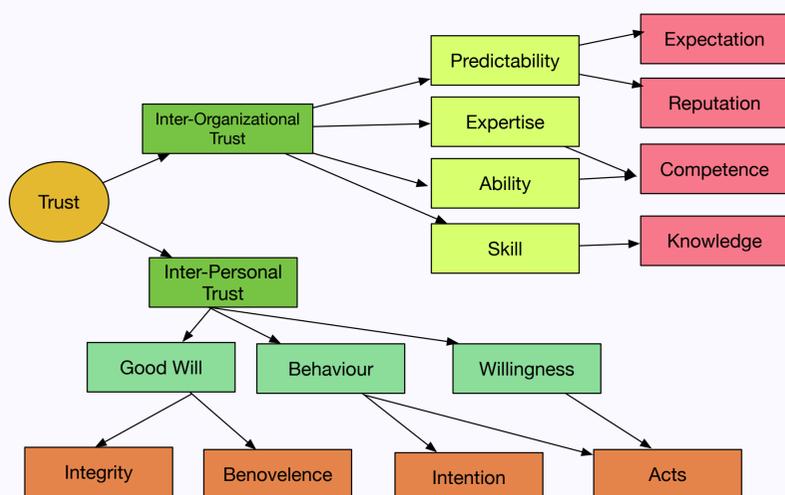
Trustworthiness Estimator Factors
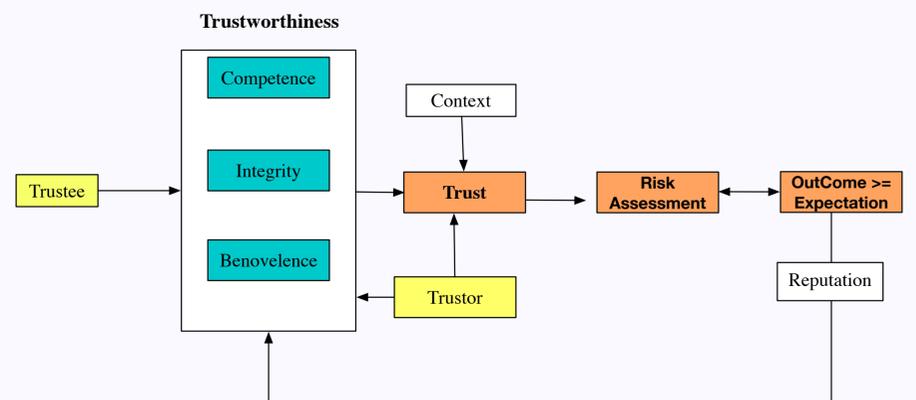
An ABM example: Simulating an evolutionary version of the Prisoner Dilemma
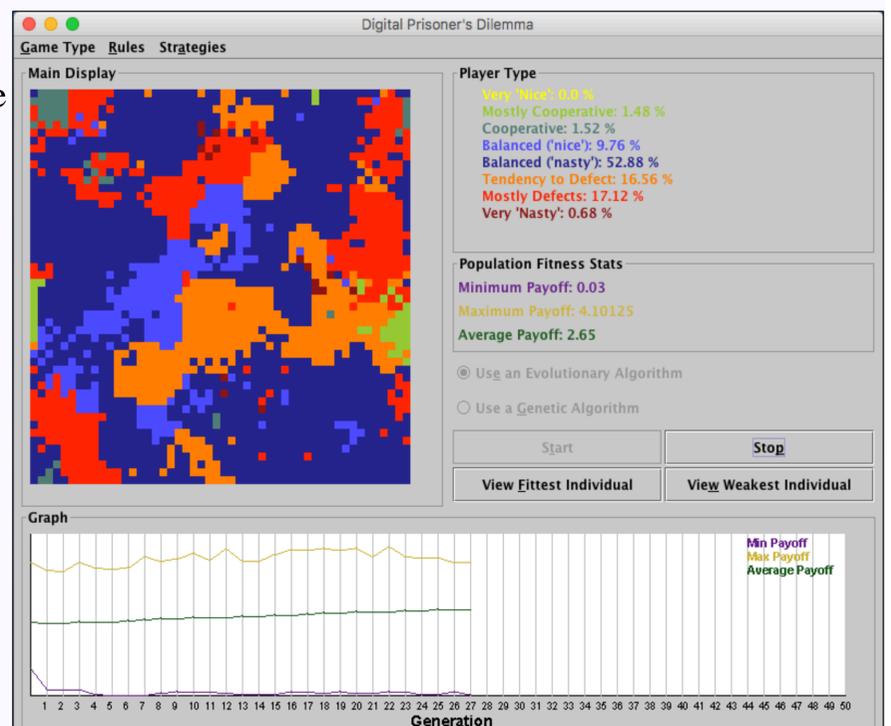
Agent based model Demo

- Apply an Evolutionary Prisoners' Dilemma to cyberspace
- Different players
- Different strategies to choose From
(e.g. Always Defect, TFT, Always Cooperate).

Goal
- Evolutionary Prisoners' Dilemma
- Understand good strategy for each prisoner
- Learn how the system survives (equilibria) or dies
- Observe the members' behaviour

Outcome
- We have to **cooperate** to **save** our organization.
- Lacking **Trust** and **fear** of the other's betrayal motivates both prisoners to testify against each other.
- **Over time** the proportion of the population choosing the **cooperate** strategy eventually becomes **extinct** (given our current setting).

UNIVERSITY OF AMSTERDAM   SNE   NWO Netherlands Organisation for Scientific Research   COMMIT/   TNO innovation for life   AIRFRANCE KLM   ciena