Secure Trustworthy Digital Market Places (STDMPs)

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The needs for S**T**DMPs

- Bring **competitor** together to bring data together to achieve a common goal.

- Use **shared data** for different purposes.

- Create a **trusted infrastructure** to process data.

How to organize such alliances?

# How to organize STDMPs functionalities across multiple Stakeholders

•Clearly defined and agreed common **benefit** defining the group's identity.

• **Common group rules** governing **use**, **access** and benefit **sharing**.

•**Organizing trust** amongst group members as means to **reduce risk** Infrastructure supporting implementation of **trust** whilst ensuring **autonomy**.
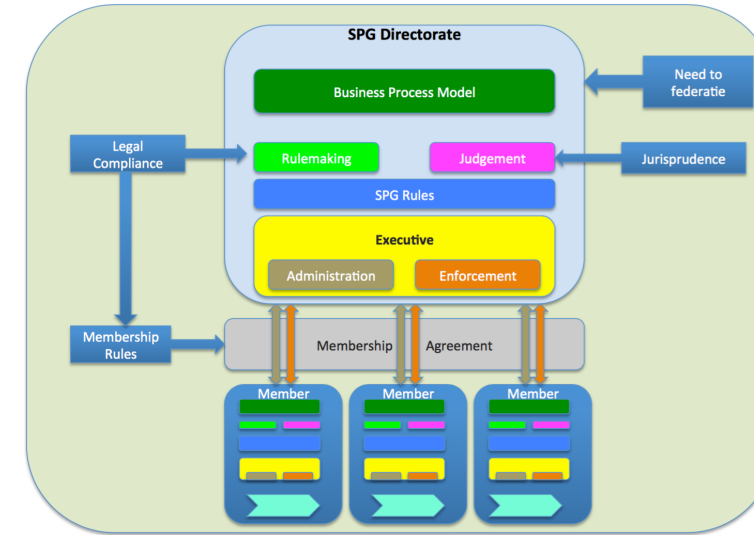
Computational Trust Framework
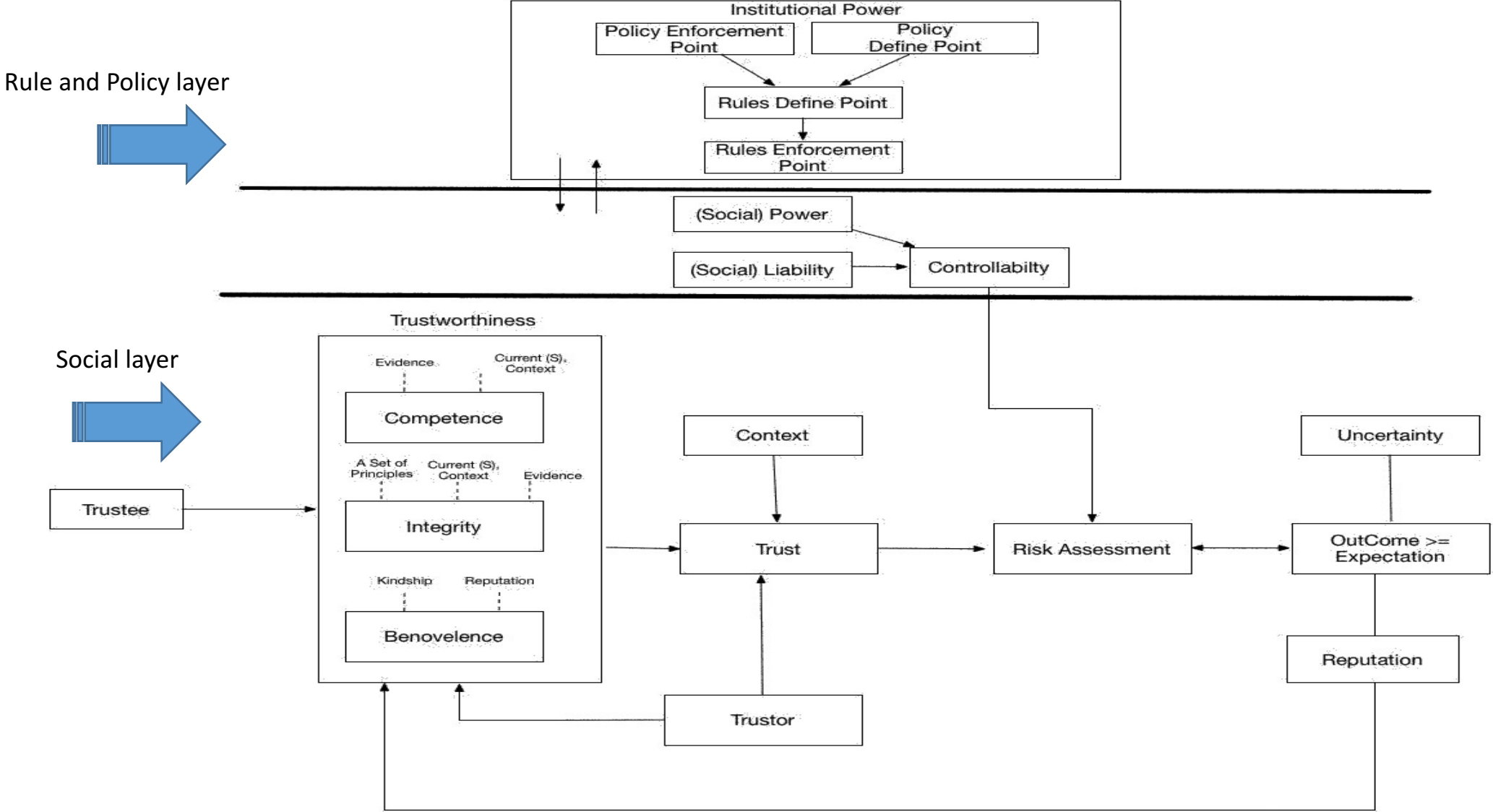
The Digital Prisoners' Dilemma

- **Agent based model Demo**

  - Apply an Evolutionary Prisoners' Dilemma to the digital world
  - Different Players
  - Different Strategies to choose From (e.g. Always Defect, TFT, Always Cooperate).

- **Goal**
  - Good Strategy
  - Learn from game
  - Observe members' behavior

Evolutionary Prisoner's Dilemma

Game Type   Rules   Strategies

Main Display
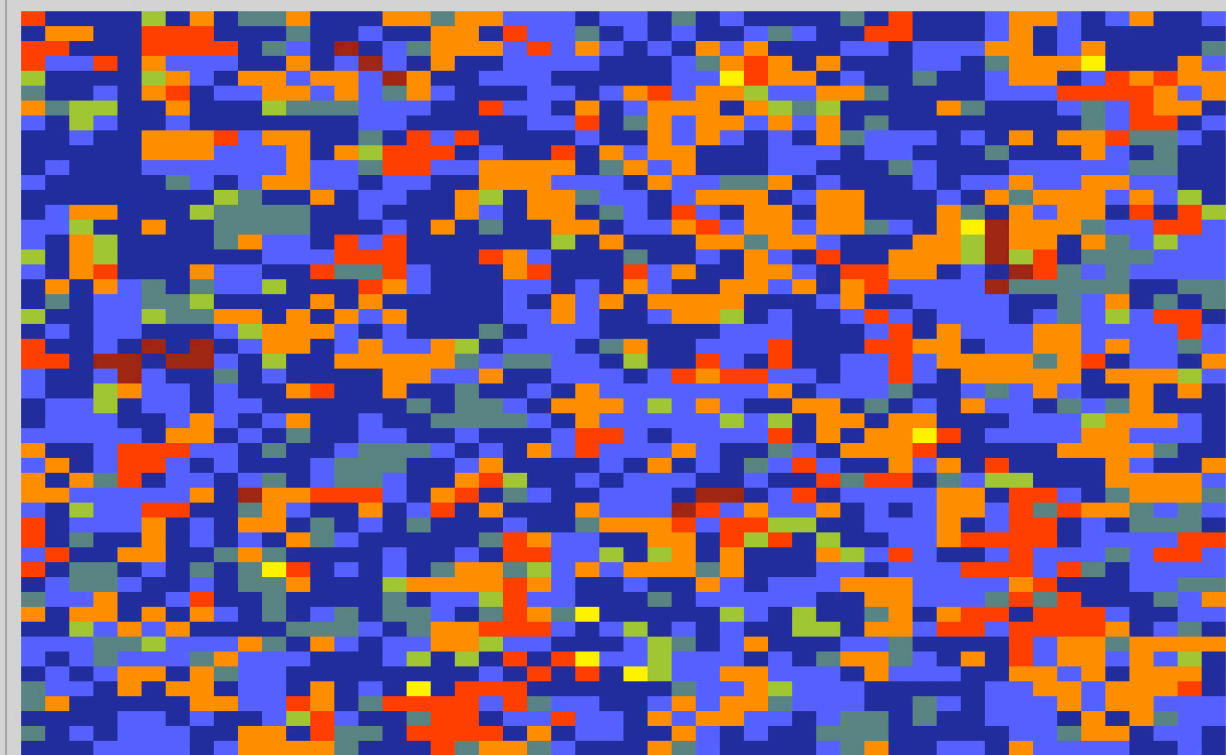
Player Type

Very 'Nice': 0.36 %
Mostly Cooperative: 2.88 %
Cooperative: 8.44 %
Balanced ('nice'): 27.16 %
Balanced ('nasty'): 34.88 %
Tendency to Defect: 17.8 %
Mostly Defects: 7.72 %
Very 'Nasty': 0.76 %

Population Fitness Stats

Minimum Payoff: 0.1925

Maximum Payoff: 4.105

Average Payoff: 2.24

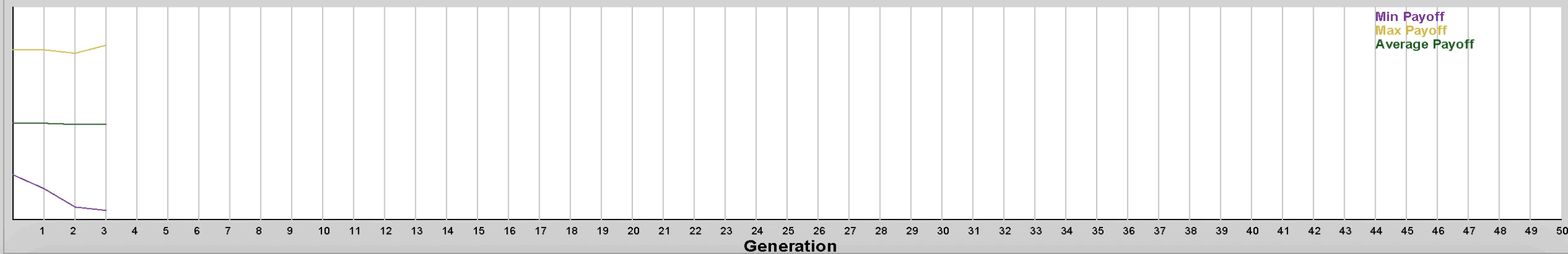◉ Use an Evolutionary Algorithm

○ Use a Genetic Algorithm

Start	Stop
View Fittest Individual	View Weakest Individual

Graph

Min Payoff
Max Payoff
Average Payoff

Generation

Challenges and lessons

- 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.
- Predicts our opponents' next move.
- Over time the proportion of the population choosing the strategy cooperate eventually becomes extinct.
- Challenges and opportunities for cooperation.

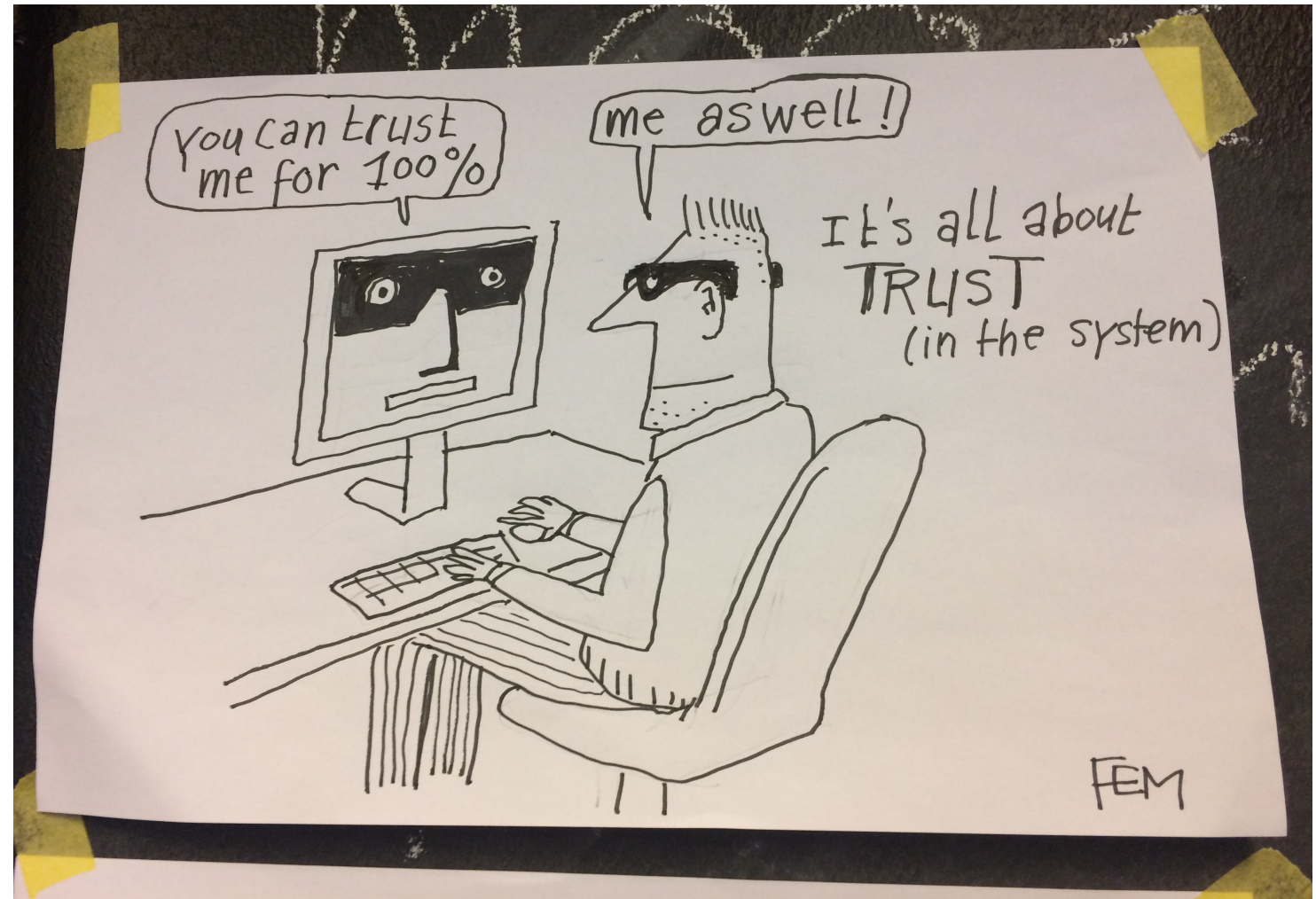↓↑ Trust = ↓↑ Speed ↑↓ Cost

Trust is (not) a technical issue!!

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