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UNIVERSITY & RESEARCH

Never waste a good crisis

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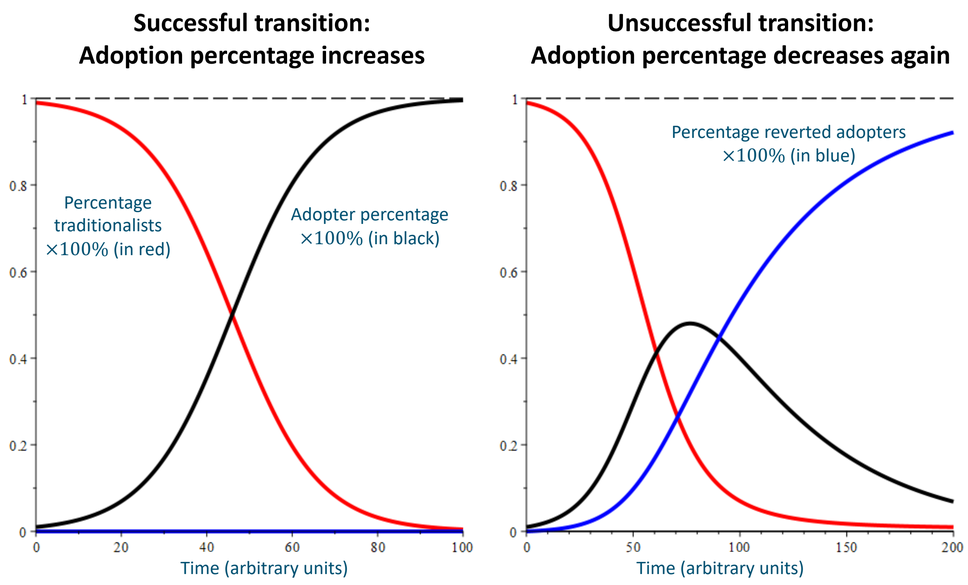
Background & purpose

Annually industry produces 100 Billion clothing items, which accounts for 10% of the carbon dioxide emission.
A transition to a sustainable clothing economy is desired.

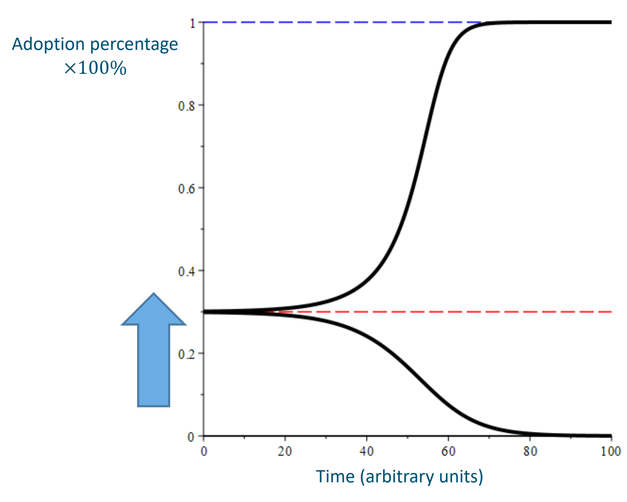
Idea illustrated with dynamic model

Transitions in economies display nonlinear responses.
Diffusion of innovation may or may not follow an S-shaped pattern:



Tipping points

Outside shocks may initiate and accelerate transitions, increasing the probability the transition will be successful.



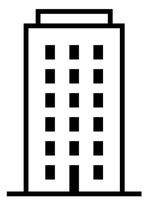
In the Figure, a minor push (blue arrow) at the right time results in the transition proceeding because the tipping point (red dashed) is crossed. The system switch is permanent.

The ***objective*** is to identify:
- Mechanisms creating such a tipping point
- Shocks that can push the system across the tipping point

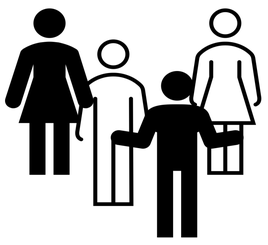
Our approach involves **simulation modelling** in which we mimic shocks and mechanisms to explore options for transitioning to a sustainable clothing economy.

Conceptual simulation model

We simplify the supply chain to the following actors:



Brands, that
- offer products
- decide on production
- communicate to consumers



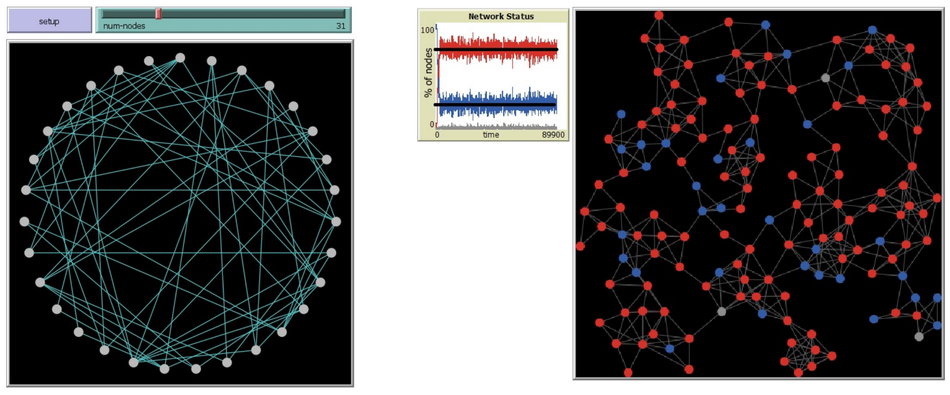
Consumers, who
- buy products
- have a monthly budget
- have preferences
- value exclusiveness
- exchange experience and opinion

Products have *binary* properties:
- Durability (values: yes (1) or no (0))

- Sustainability (idem)

- High-value branding (idem)

Each product has a price premium €



Agents are linked either via a *small world network (left)* or a network of *semi-independent clusters (right)*.

Readiness

- Model versions are implemented as Agent Based simulation Models
- Testing and verification

Lessons learned

- Feedback mechanisms are essential for tipping points
- Adoption of sustainable practice occurs through social network
- 'Pockets' of consumers do not seem susceptible because of (i) diversity in agent properties, and (ii) network properties that make or break conditions for diffusion

Next steps

- Parameterization against data.
- Validation against expert evaluation.
- Model extensions and tailoring to specific cases.

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