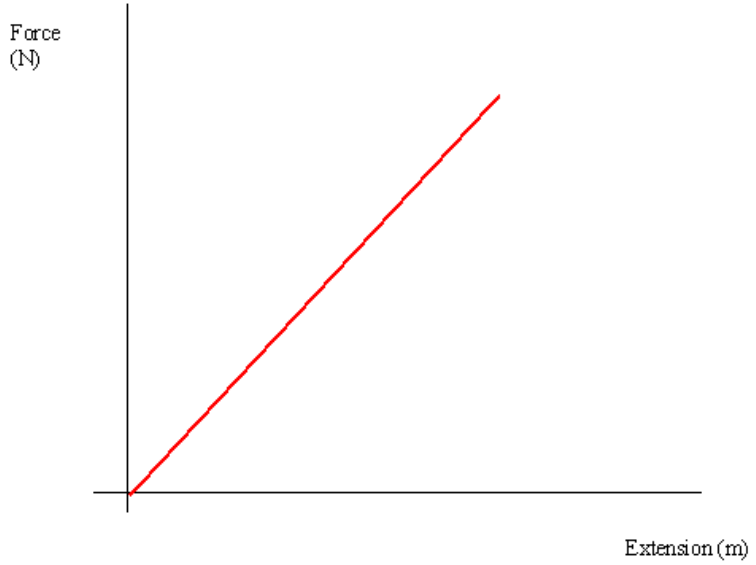
Systems thinking and complex processes

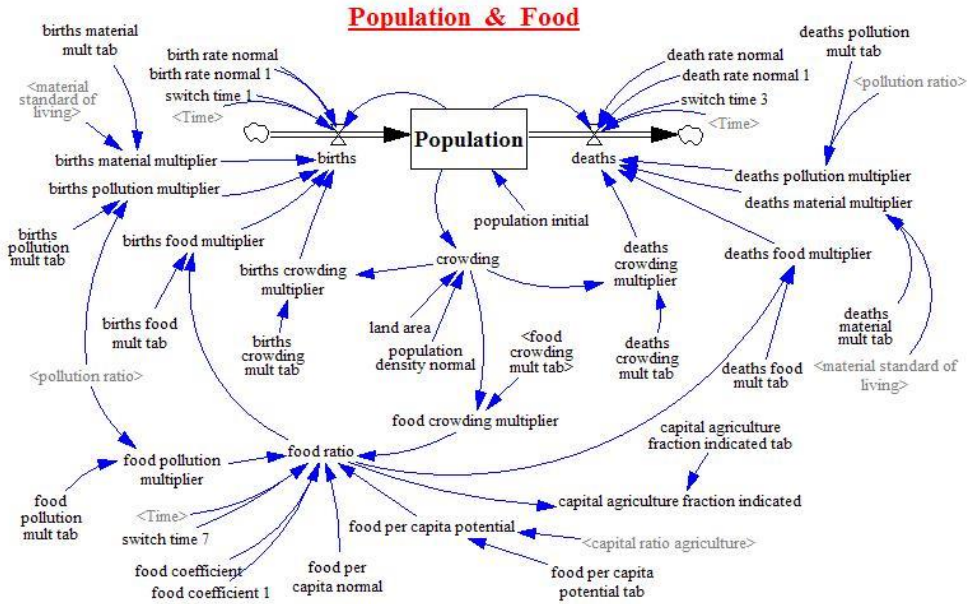
Simple systems

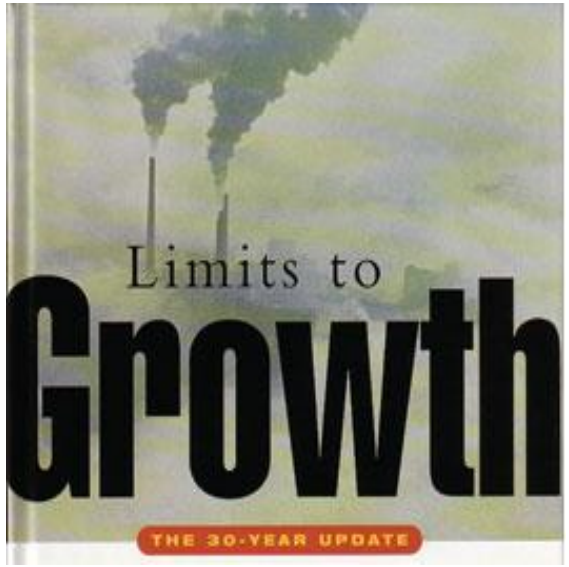


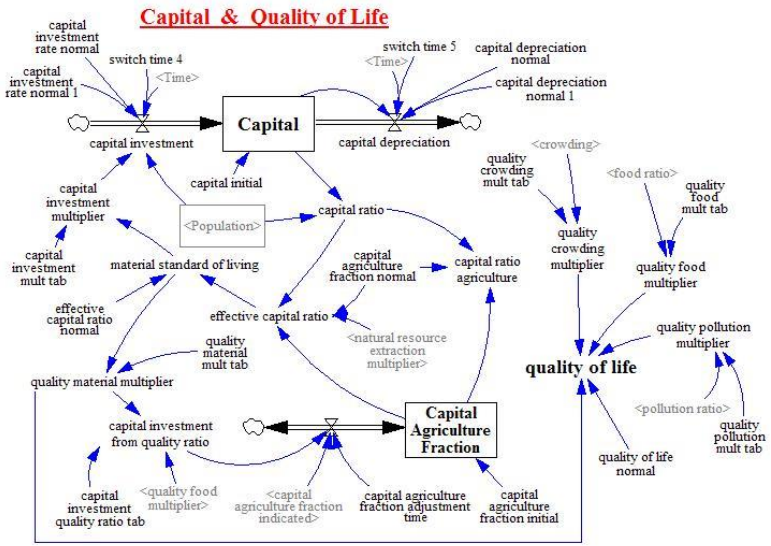
- Predictable;
- Mechanical;

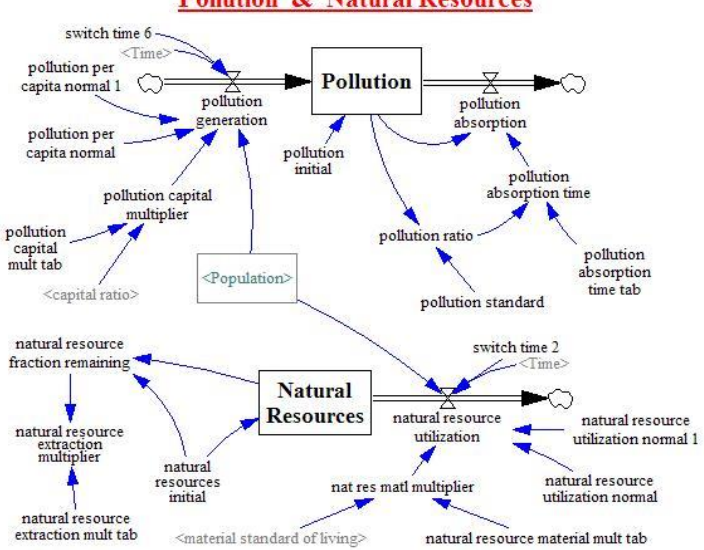
"Reductionism produced a "machine view" of the world, a view captured in the work of Sir Isaac Newton. Metaphorically the world was likened to a sealed clock, a closed system, perpetually running on fundamental laws like "to everything action there is an equal and opposite reaction." **Hutchins, Systemic Thinking, 1995**

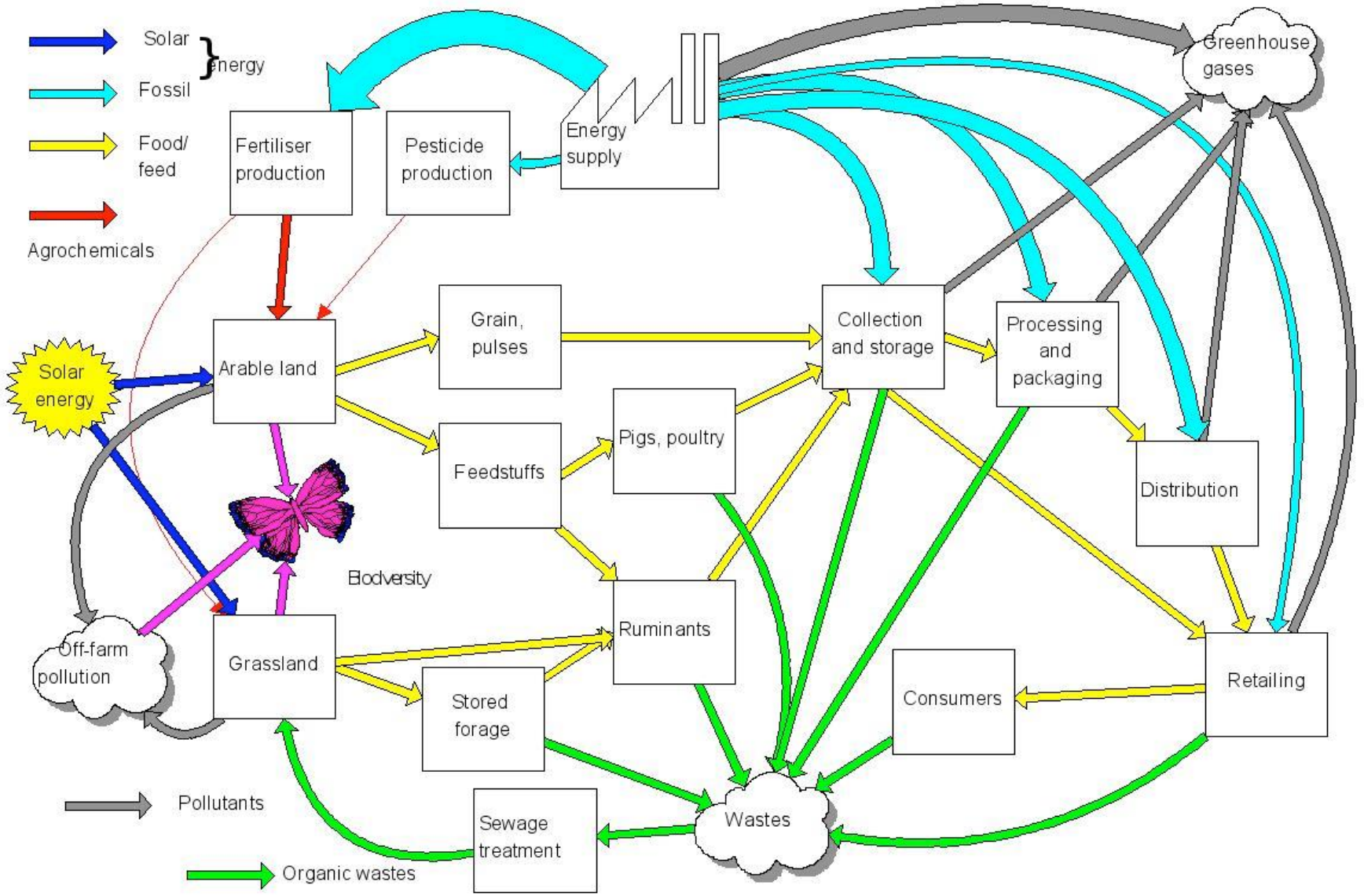
Complex systems










Solar
Fossil
energy
Food/
feed
Agrochemicals
Fertiliser production
Pesticide production
Energy supply
Greenhouse gases
Solar energy
Arable land
Grain, pulses
Collection and storage
Processing and packaging
Feedstuffs
Pigs, poultry
Distribution
Biodversity
Off-farm pollution
Grassland
Ruminants
Stored forage
Consumers
Retailing
Pollutants
Sewage treatment
Wastes
Organic wastes

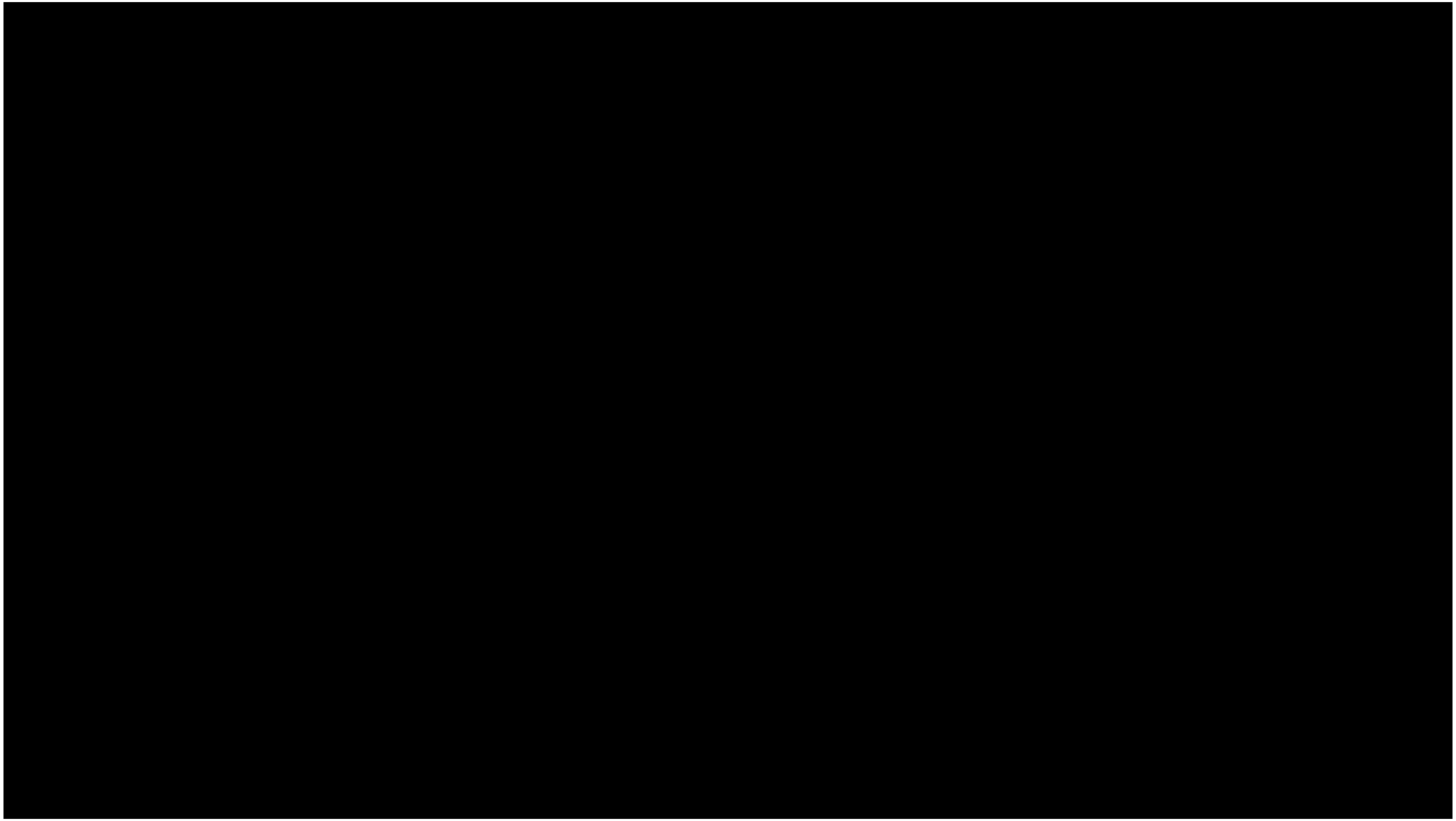
Complex behaviour

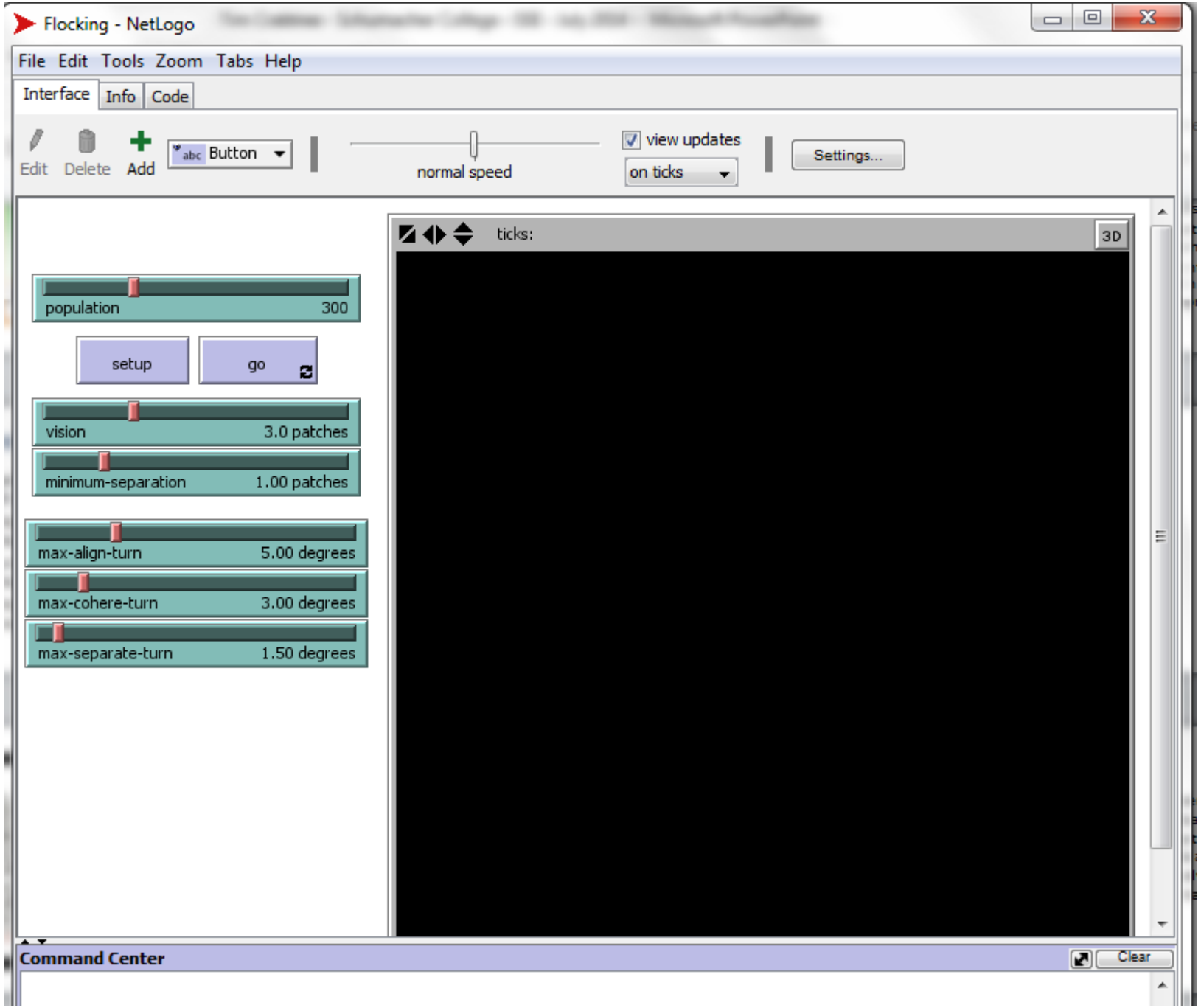
- Complexity theory builds on Systems Theory
- Complex systems are non-linear and their specific behaviour is unpredictable
- Complex behaviour arises from *interaction*
- Complexity theory focuses on *relationships*
- The distinguishing feature of complex systems is that they can *create new order*

Source: Eve Mittleton-Kelly

amazing starlings murmuration (full HD) -www.keepturningleft.co.uk

https://www.youtube.com/watch?v=eakKfY5aHmY




Flocking - NetLogo
File Edit Tools Zoom Tabs Help
Interface Info Code
Edit Delete Add
Button
normal speed
view updates
on ticks
Settings...
ticks:
3D
population 300
setup
go
vision 3.0 patches
minimum-separation 1.00 patches
max-align-turn 5.00 degrees
max-cohere-turn 3.00 degrees
max-separate-turn 1.50 degrees
Command Center
Clear

Question:

What difference do you perceive between the video of starlings in flight and the computer simulation?

From representations of systems to participation in dynamic processes

- We are immersed in problems of organised complexity – these are situations where you have a moderate number of variables, but strong non-linear interactions amongst those variables.

- This involves dealing simultaneously with a sizeable number of factors which are interrelated into an organic whole.

Patricia Shaw:
Systems theory & complexity science

“We make representations of the relatively stable patterns emerging in our ceaseless activity so that we can look at them together and agree on changes we can identify and plan for. This is why organisations, institutions and the civic realm are full of models, 2 by 2 matrices and mappings of various kinds.

But representations can never capture real complexity because that complexity is a flow in time not a static image or model. The representations are always not just inadequate but useful approximations, they can really mislead and falsify - taking them literally easily leads to frustration.”

Patricia Shaw

We are used to thinking/seeing/experiencing in terms of a world of separate THINGS apart from ourselves that need to be managed.

- *Things* are clearly defined, identifiable, separate, bounded, stable, graspable, measurable, countable entities.
- They may be material *things* or intangible conceptual *things* such as organisations, jobs, managers, systems, leaders, resources, strategies, plans, goals, targets, budgets, meetings, cultures, visions……
- Such *things* can be connected, arranged, ordered, organised *by design* into structures.
- Such ordering connections are *universal, linear, rational, sequential, predictable, neutral.*

Complexity invites us to think/see/experience in terms of a world of PATTERNED FLOW in which we are inextricably immersed.

- This dynamic flow is not uniform but patterned as events and activities emerging in webs of interdependent relating.
- Patterning (irregular regularities) emerges spontaneously through self-organisation at many scales simultaneously.
- Such self-patterning processes are local, reciprocal, non-linear, lateral, unpredictable, improvisational in which both individual and social identities are emerging simultaneously.

Some questions

- What are the limitations of strategies, business plans, “theories of change” and predictions of outcomes, in a world that is complex and unpredictable?
- How do we keep organisations “alive” and generative, taking inspiration for example from the Latin American notion of continuous “*formacion*”? How also do we maintain our own levels of commitment, well-being and satisfaction in our work?
- How can we resist the expectation that we should seek to scale up initiatives in the conventional way rather than through a process of networked growth in clusters of organisations?

From scaling to complexity

Starting point not a particular project or technology but emerging ecology of projects each of which has its own generative capacity, and constantly creating new networks with other projects

SOCIAL INNOVATOR SERIES:
WAYS TO DESIGN, DEVELOP
AND GROW SOCIAL INNOVATION

THE OPEN BOOK OF SOCIAL INNOVATION

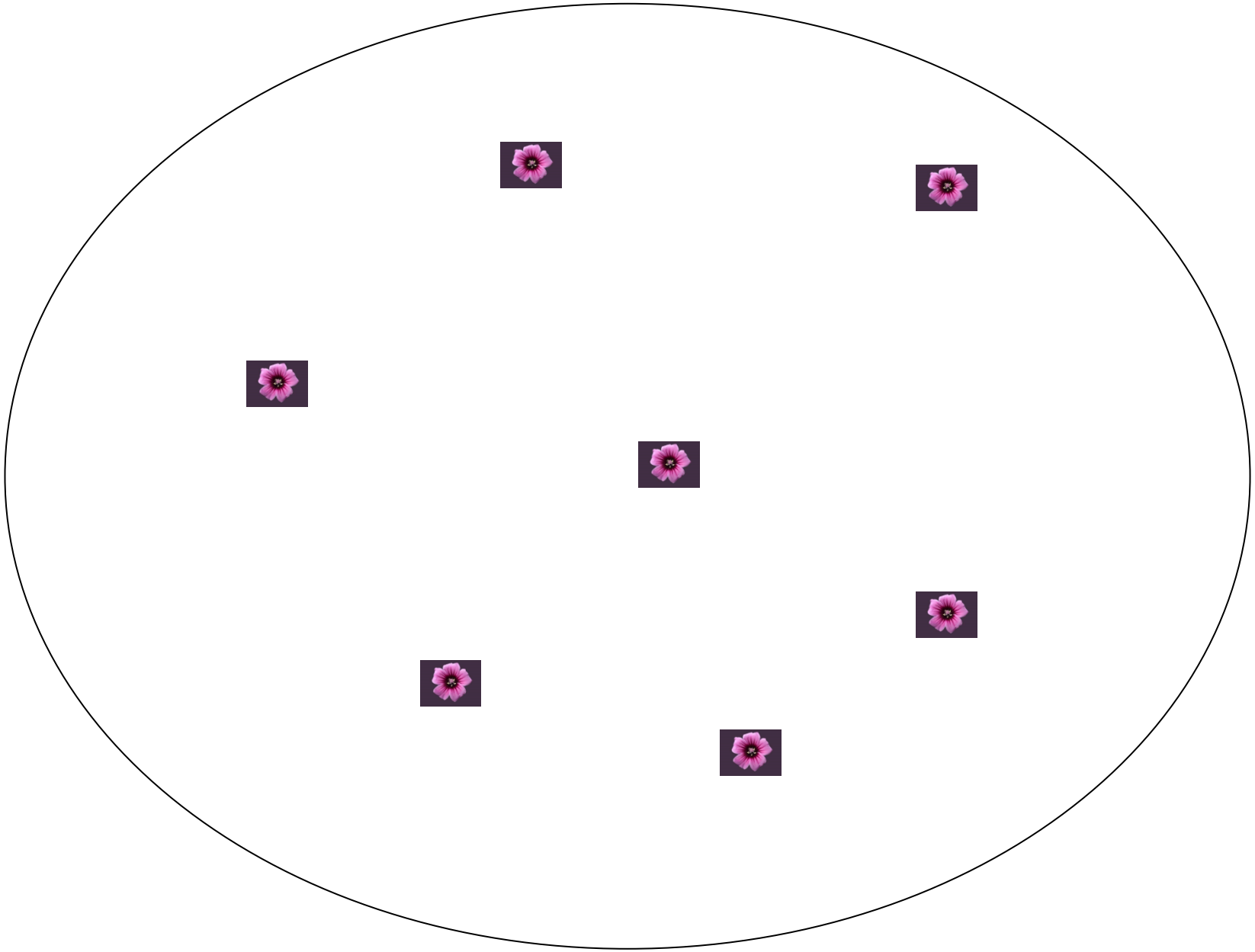
Robin Murray
Julie Caulier-Grice
Geoff Mulgan

THE YOUNG FOUNDATION

NESTA
THE LAB Innovating public services

Robin Murray

For the spread of a social innovation what is needed is to establish the relative autonomy of new practices from the prevailing 'contextual forces' and attract others into this emerging sub-system - extending its strength and deepening its complexity




Riverford
FAIRTRADE
McDonald's
HOLLAND & BARRETT
Sainsbury's
Napolina
ASDA
part of the WAL*MART family
BEN & JERRY'S
TESCO
GREGGS
Waitrose
Yeo Valley organic
Abel & Cole
MARINE STEWARDSHIP COUNCIL
M
McCain
COSTA COFFEE
SINCE 1971
MORRISONS
J·D·WETHERSPOON
ocado
Harry Ramsden's
World Famous Fish & Chips
WALL'S
Birds Eye
The co-operative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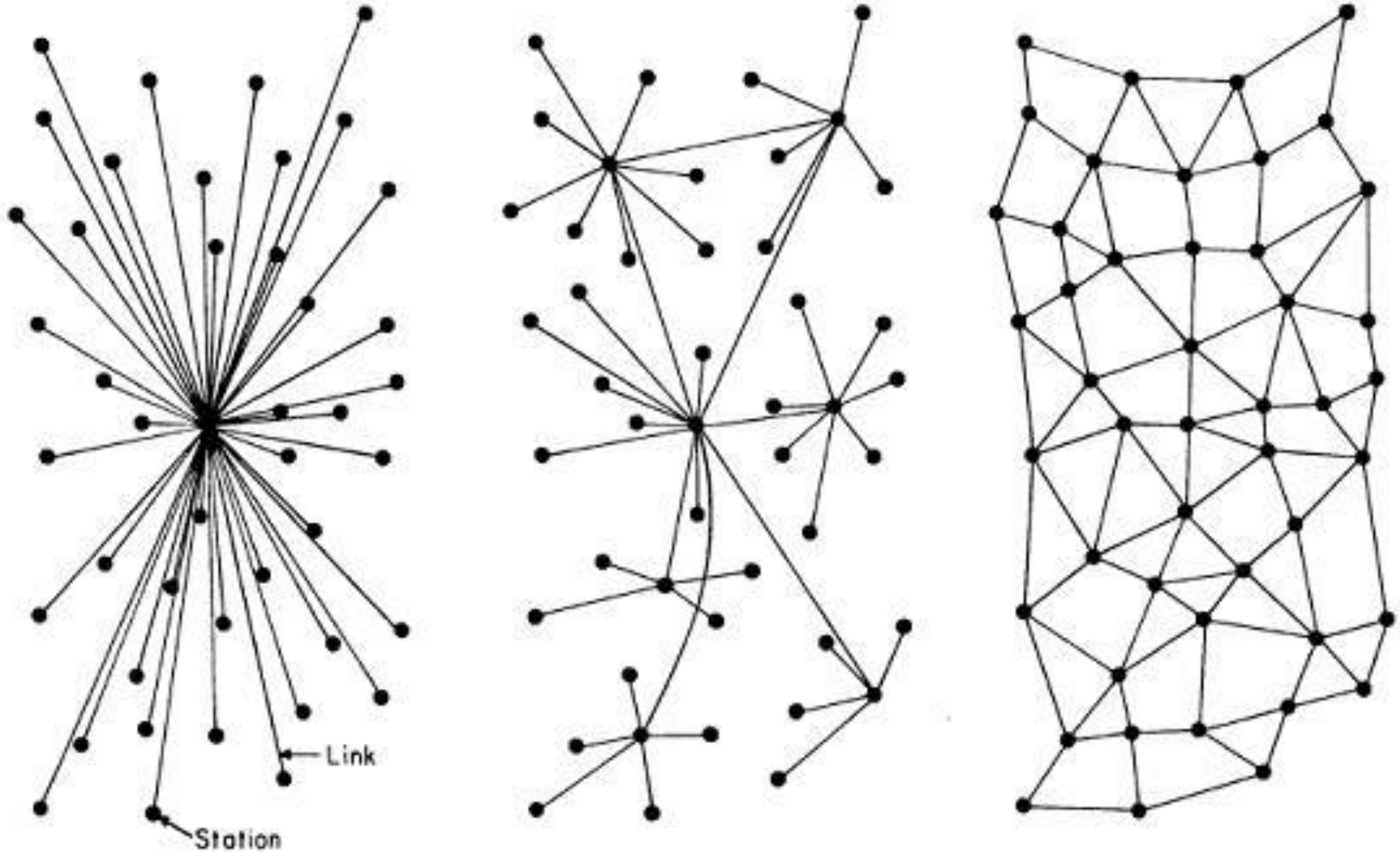
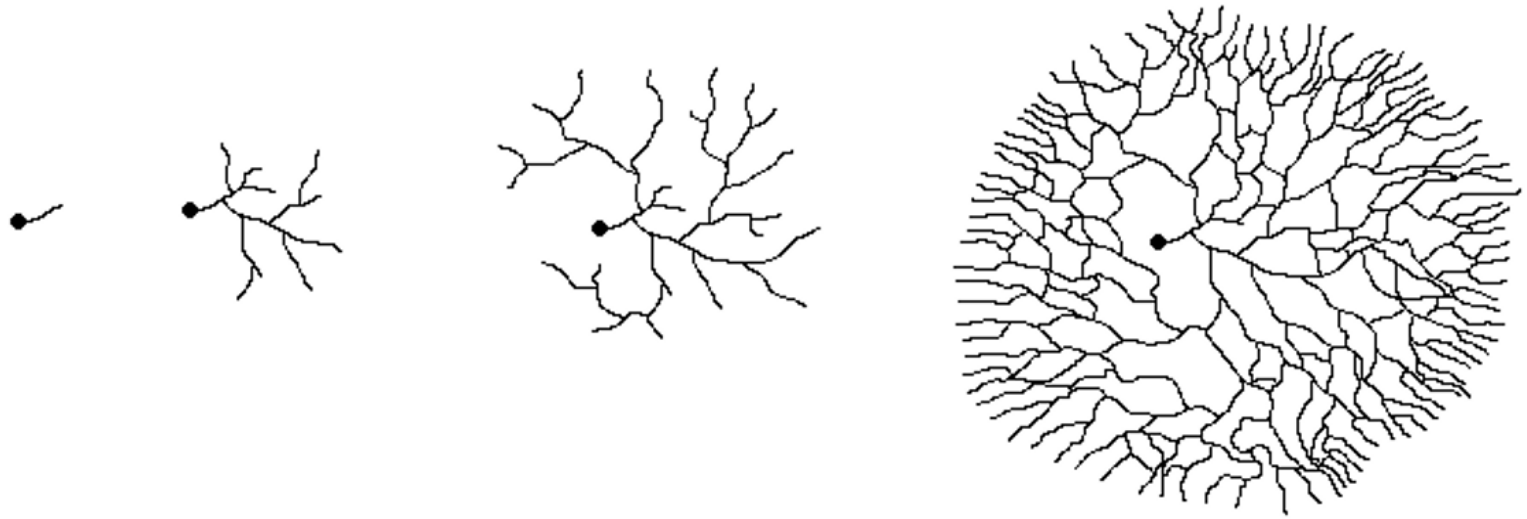
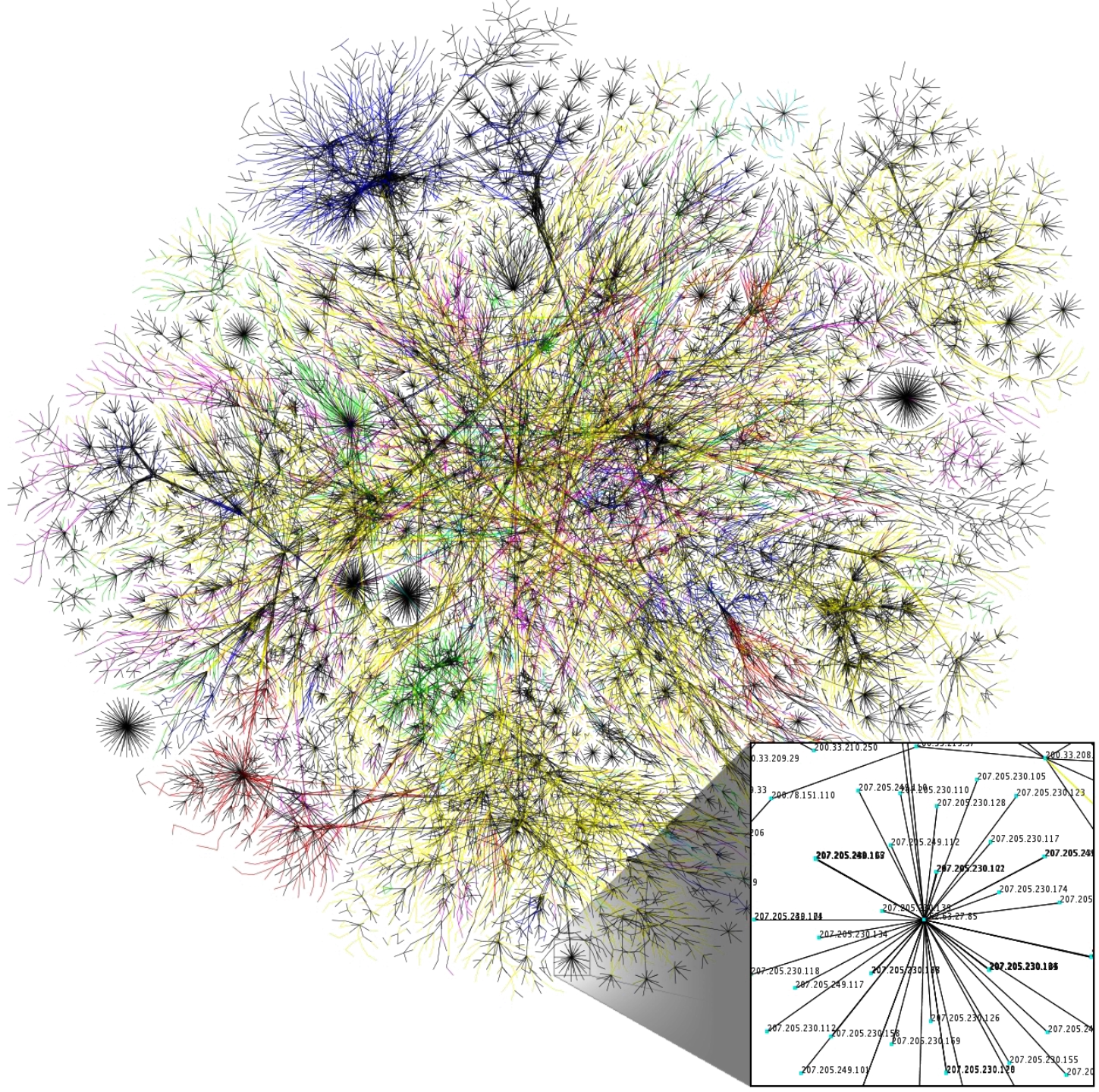


CENTRALIZED
(A)

DECENTRALIZED
(B)

DISTRIBUTED
(C)

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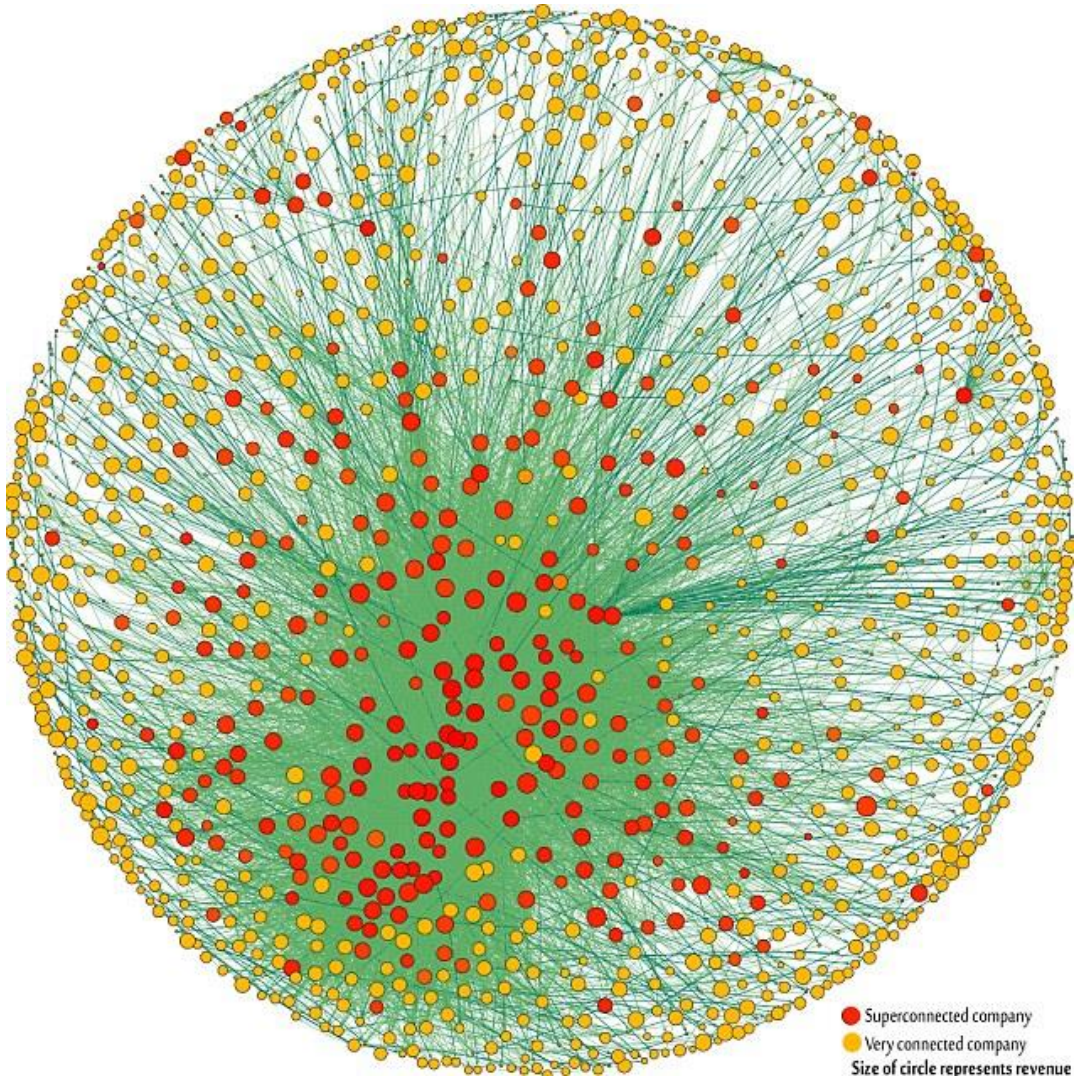


The 1,318 transnational corporations that form the core of the globalised economy - connections show partial ownership of one another, and the size of the circles corresponds to revenue. The companies 'own' through shares the majority of the 'real' economy

Mondragon, Spain

84,000 employed in
256 co-operatives

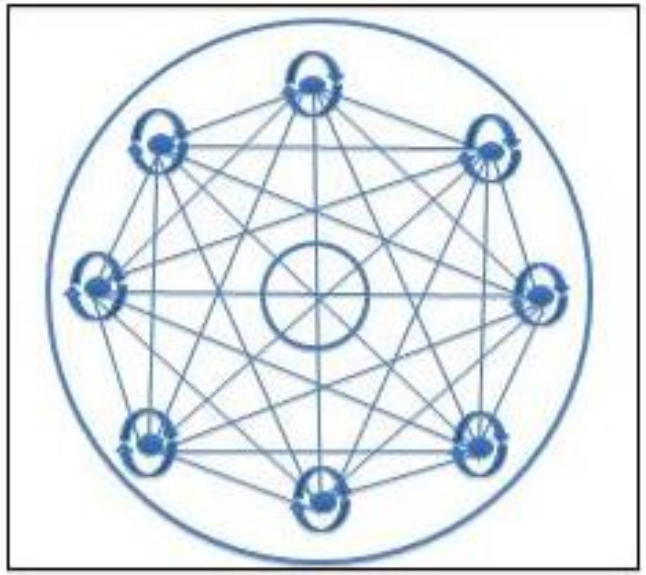
Supported by Mondragon Co-operative Corporation

CAJA LABORAL

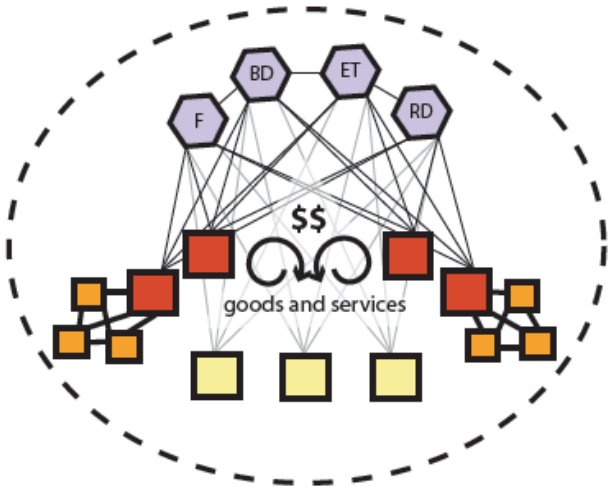
MONDRAGON

HUMANITY AT WORK

Finance
Industry
Distribution
Knowledge



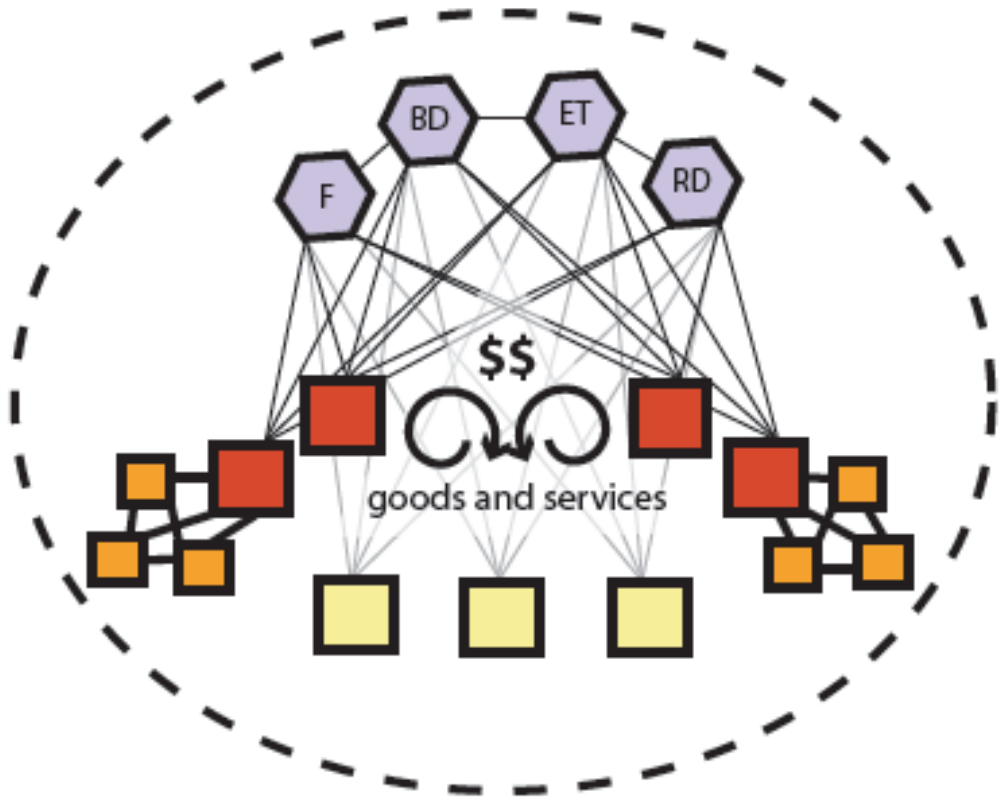
Cooperative Network Model of Endogenous Economic Development



LEGEND

- Defined Geographic Area
- Secondary Cooperatives or Institutions:
  F = Finance
  BD = Business Development
  ET = Education/Training
  RD = Research & Development
- First generation cooperatives
- Second generation cooperatives
- Spin-off Cooperatives
- Cooperative Groups

Cooperative Network Model of Endogenous Economic Development



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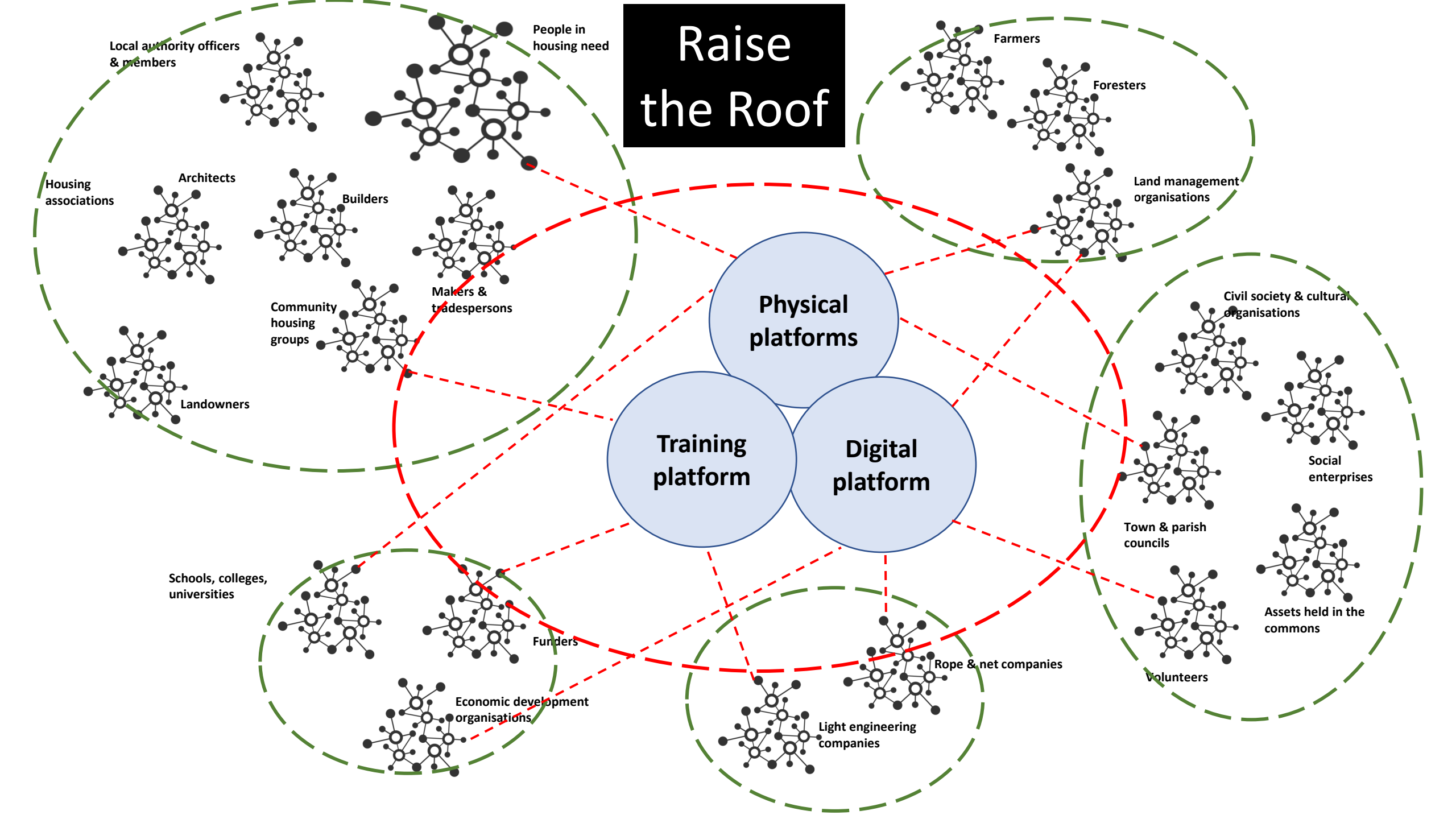
Raise the Roof
Local authority officers & members
People in housing need
Housing associations
Architects
Builders
Makers & tradespersons
Community housing groups
Landowners
Farmers
Foresters
Land management organisations
Physical platforms
Training platform
Digital platform
Civil society & cultural organisations
Social enterprises
Town & parish councils
Assets held in the commons
Volunteers
Schools, colleges, universities
Funders
Economic development organisations
Rope & net companies
Light engineering companies