Engenya

Theory to practice:
A conceptual study in process evolution

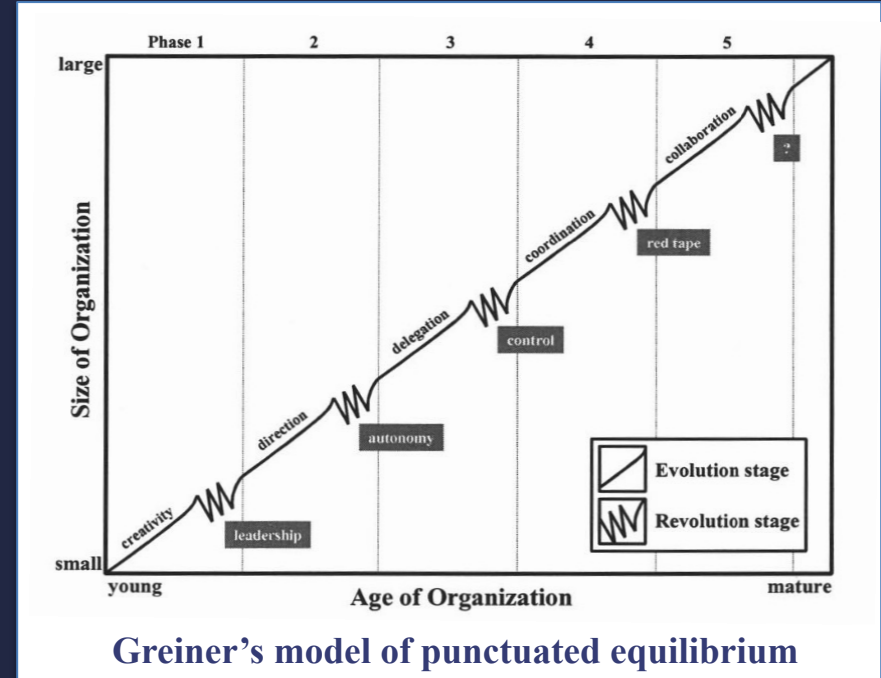- Growing company with evolving processes needs increased control but bureaucracy is undesirable

- Creative people need freedom to operate effectively

- With change, key people may leave – the company needs to have a mechanism in place to ensure know-how is retained


Greiner's model of punctuated equilibrium

Greiner, L.E., "Evolution and Revolution as Organizations Grow," *Harvard Business Review*, May-June 1998

- We don't have to understand the complete system

- Policy evolution can be thought of in the same way as genetic evolution

  - Policies represent evolving genes – their fitness judged against some objective function

- Mechanisms of evolution

  - Recombination (learning)

  - Mutation (innovation)

Learning by recombination

Policy innovation
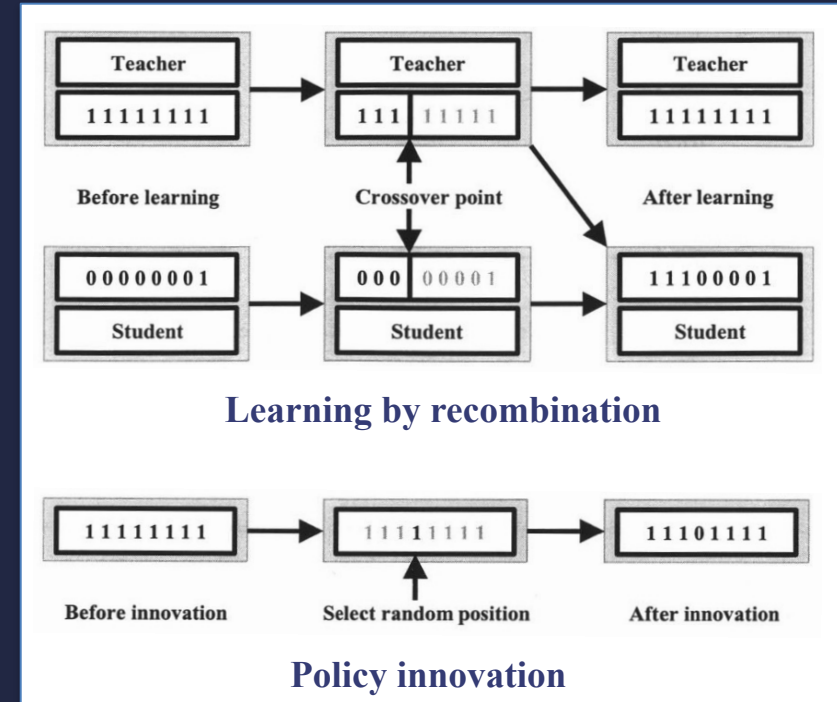
Hines, J.H., House, J.L., "The source of poor policy: controlling learning drift and premature consensus in human organizations," *System Dynamics Review*, Vol. 17, No. 1, pp 3-32, Spring 2001
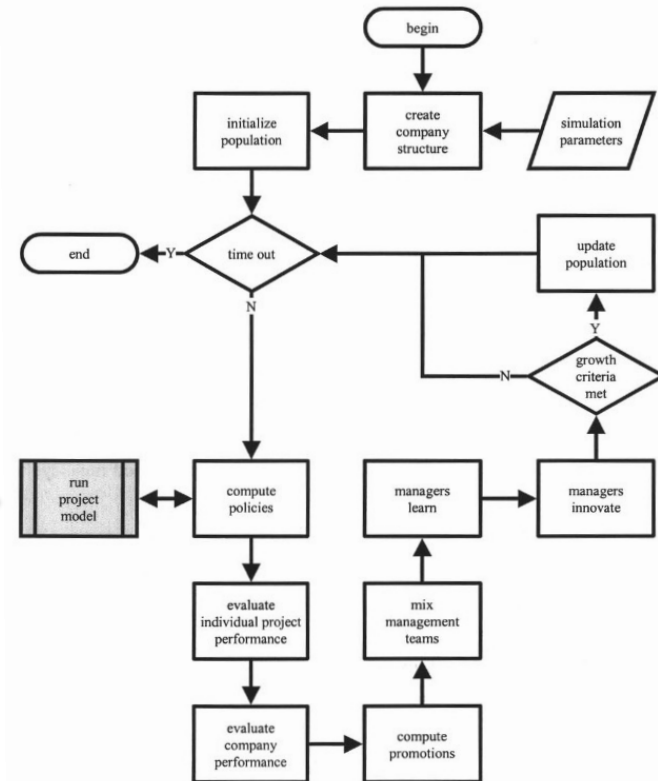
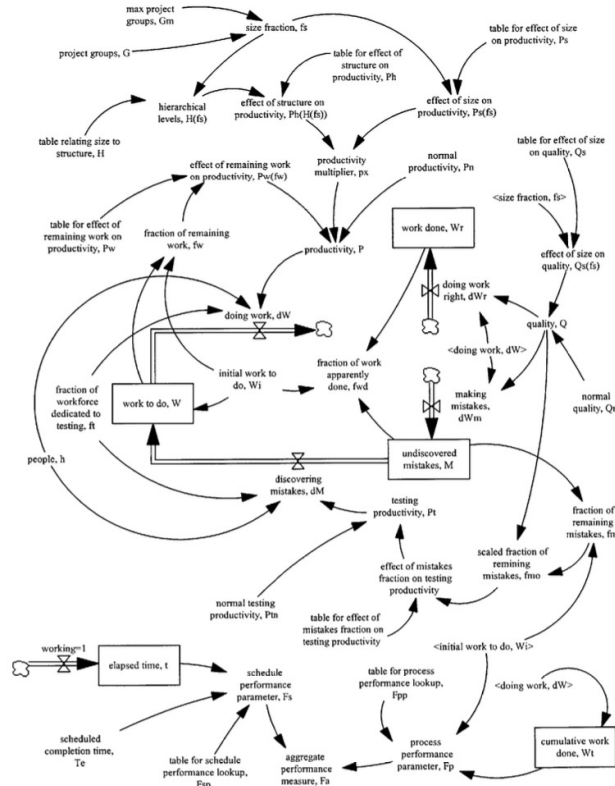- Organizational evolution takes place in the context of punctuated equilibrium – they are interdependent

- Organizational evolution must be guided through revolution by:

  – Setting direction

  – Pointing and pushing

  – Mixing people

  – Upsetting consensus

Modelling
System dynamics
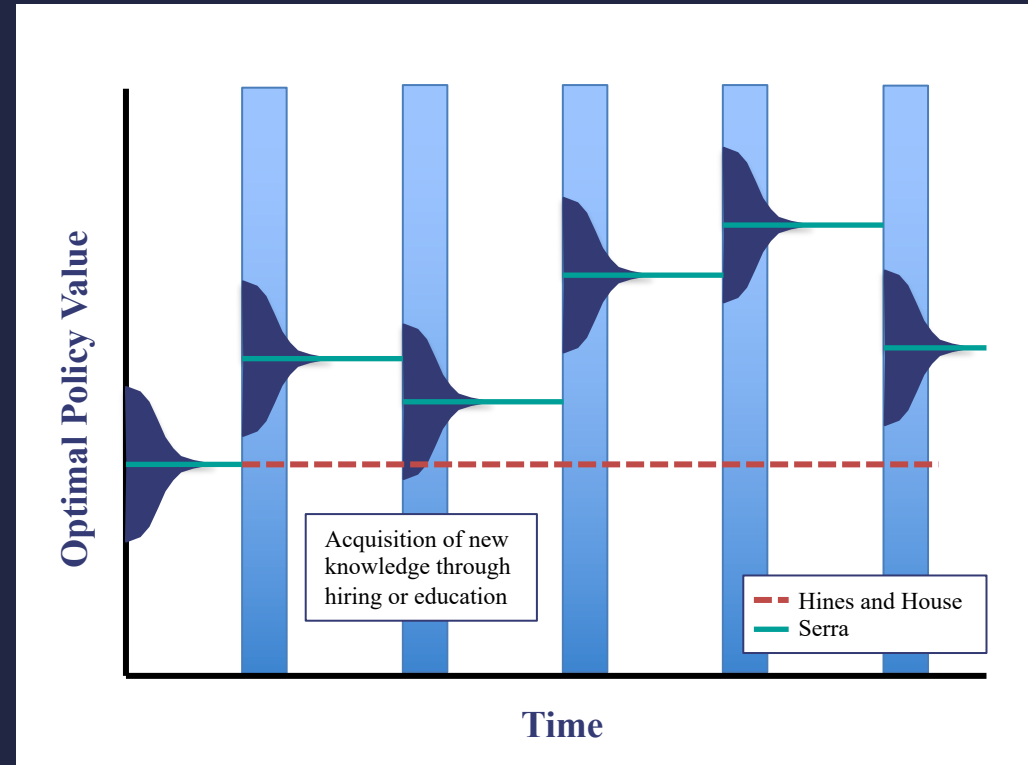
System Dynamics Project Model

Genetic Algorithm (OrgEv Simulator)

Project model

- Work flow
  - Productivity-quality balance
  - Testing
- Effects of growth
  - Size
  - Structure
- Performance evaluation
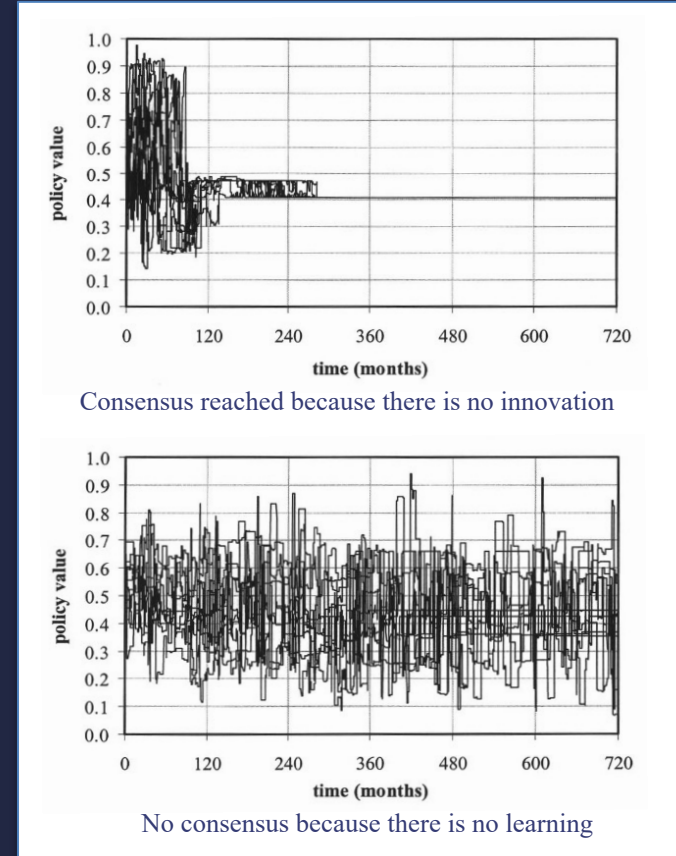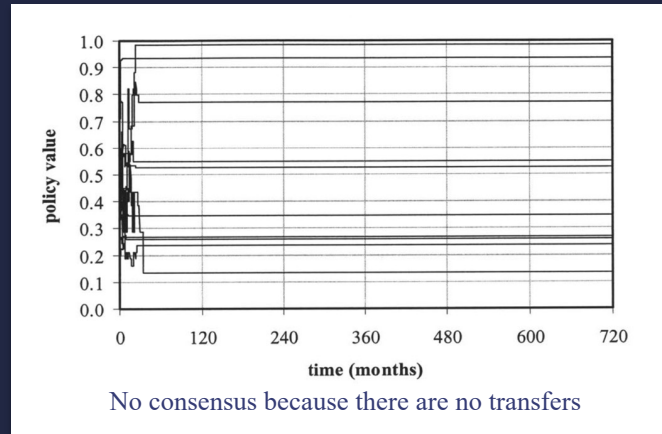 - Schedule
  - Process

OrgEv simulator

- Function
  - Team policy
  - Performance evaluation
  - Promotion
  - Learning
  - Innovation
- Control
  - Division
    (number, team size, transfers)
  - Company
    (fractional growth)

- Assumption: No growth
- Influences on success of policy evolution
  - Number of divisions (fixed)
  - Management team size (fixed)
  - Average transfer time (variable)
  - Average time to learn (variable)
 - Average time to innovate (variable)

Consensus reached because there is no innovation

No consensus because there is no learning

No consensus because there are no transfers

- Assumption: Growth

- Influences on success of policy evolution

  – Number of divisions (variable)

  – Management team size (variable)

  – Frequency of policy innovation (variable)

  – Performance requirements (variable)

  – Fractional growth (variable)

- Evolving optimum
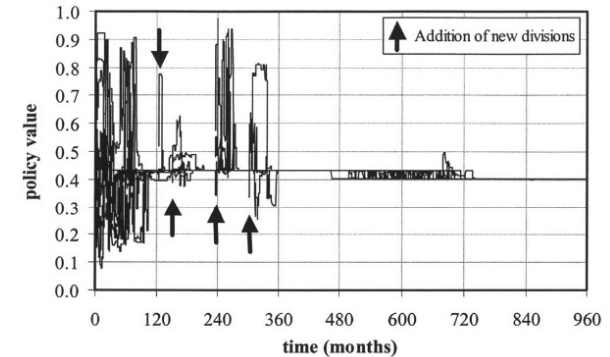
Effect of policy innovation (upsets consensus)
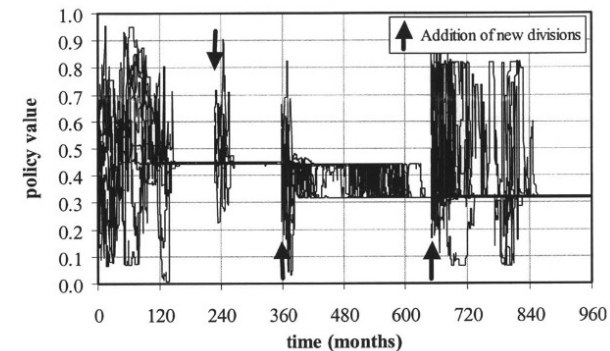
Evolving consensus with introduction of new knowledge

- The basic rules must be observed
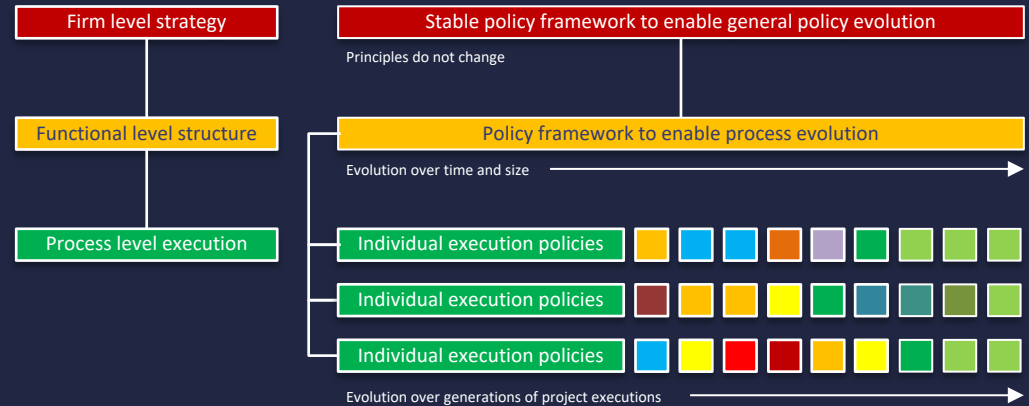
  - Mixing (learning)

  - Direction (pointing and pushing, examples)

- Relying only on policy innovation is gambling

- Successful evolution with high fractional growth

  - Probability of optimal policy choice is higher

  - Can overcome status of previously successful managers

  - Widespread disruption of consensus triggers shift

Leadership

Structure

Incentives

Culture

- **Organizationally**

  - Organizational design must support evolution

  - Supporting policy structure is critical

- **Evolutionally**

  - Must be deliberate about injected knowledge

    - Self evaluation

  - Must protect newcomers/new knowledge

    - Training

    - Visibility

| Firm level strategy | | Stable policy framework to enable general policy evolution |

Principles do not change

| Functional level structure | | Policy framework to enable process evolution |

Evolution over time and size →

| Process level execution | | Individual execution policies |

| | Individual execution policies |

| | Individual execution policies |

Evolution over generations of project executions →

People do not make random decisions!

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