

# Understanding post-fordism measuring hierarchy in formal and informal networks

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# Main traits of post-fordism at micro-level

- ICT diffusion
- Organizational flexibility
- Organizational de-verticalization, outsourcing and focusing on core business
- High and increasing share of non-handworkers
- Organizational de-hierarchization: flattening, de-centralization, de-bureaucratization

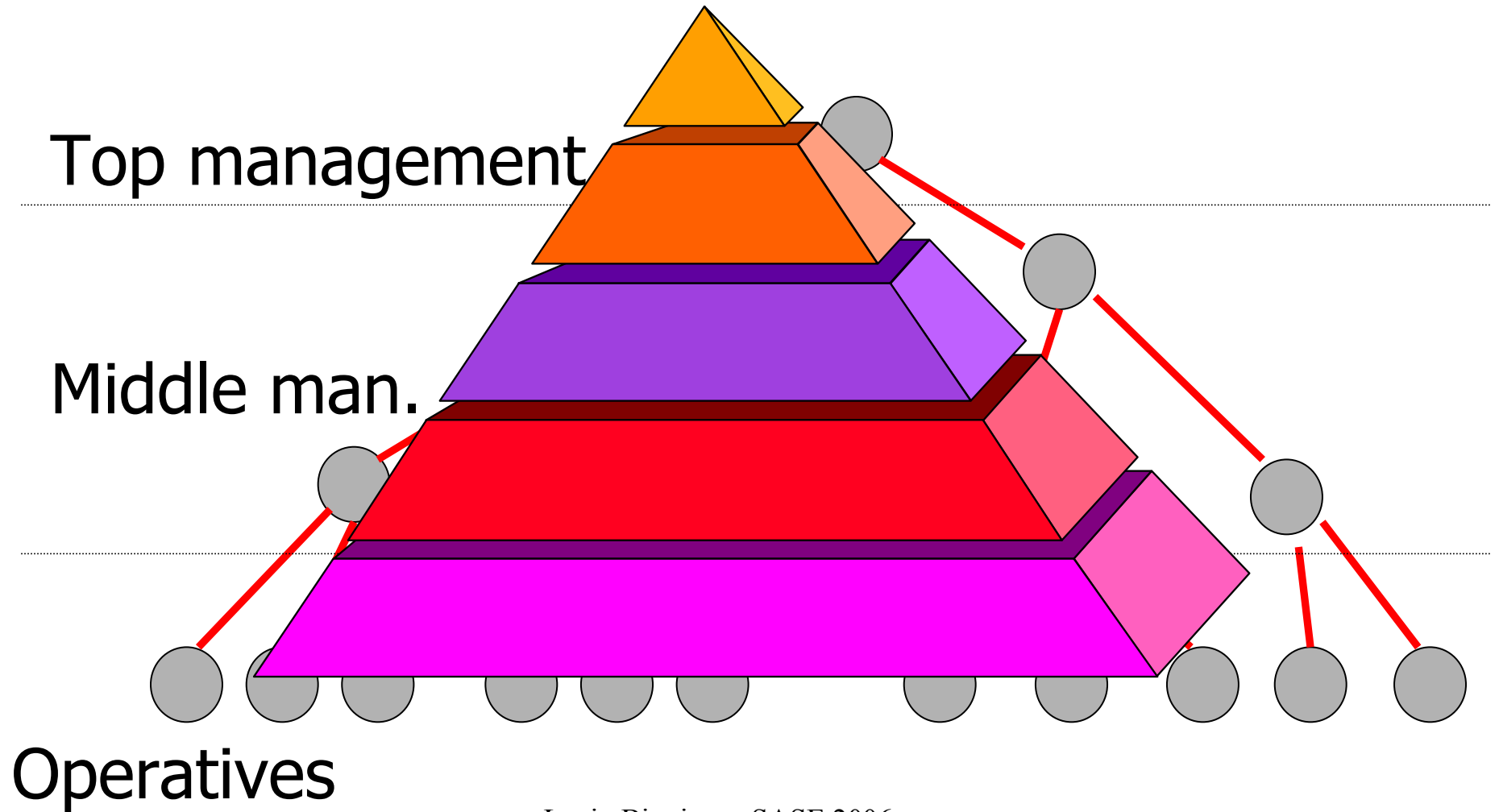
# Concepts of hierarchy in main scholars

- Weber/Taylor: superior-subordinates
- Simon: inclusivity, decomposability, modularity
- (Marshak &) Radner: outtree of information processors
- Schrader et al.: organizational chart

# Questions concerning the concepts of hierarchy

- Source, rationale, and legitimation of hierarchy
- Comparing efficiency of different types of hierarchies
- Search of algorithms optimizing hierarchical structure
- The contradictory role of ICT, which allows more collective participation and larger span of control

# Typical pyramidal (hierarchical) structure of organizations

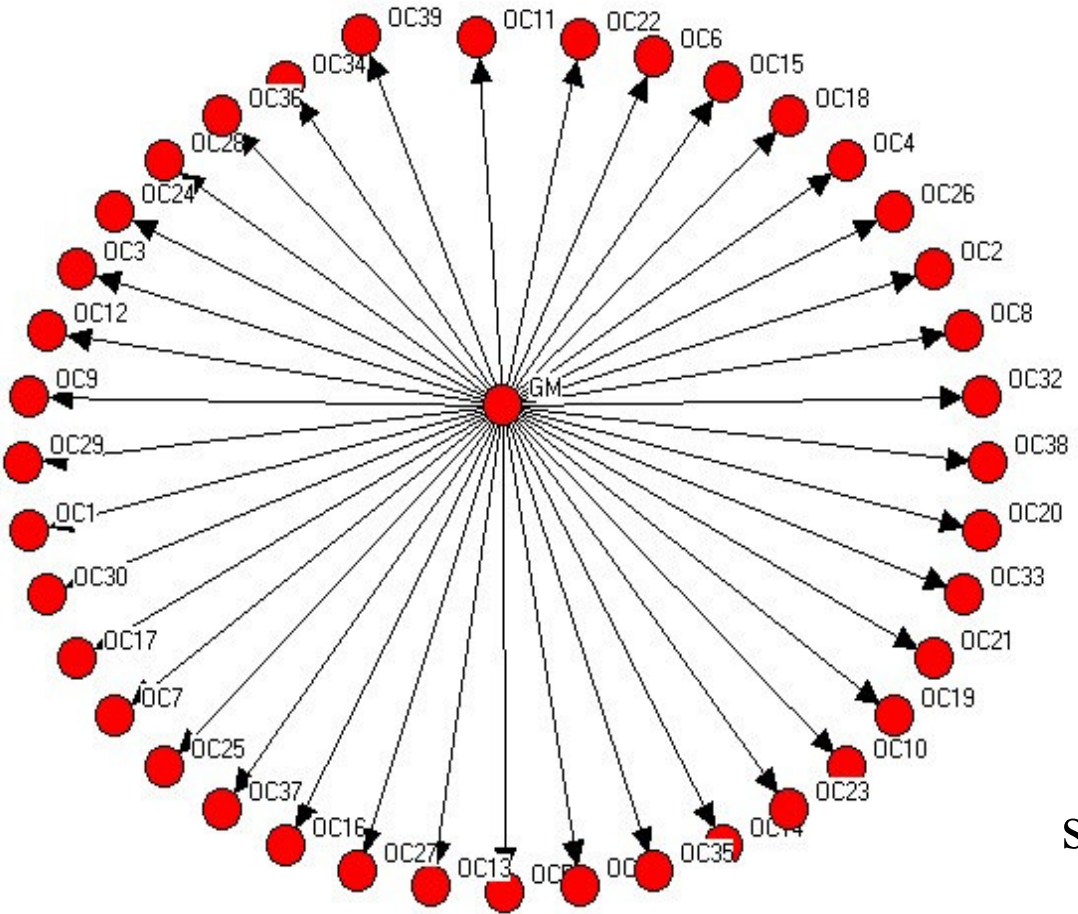


# The archetypes of hierarchy

two forms of outtree

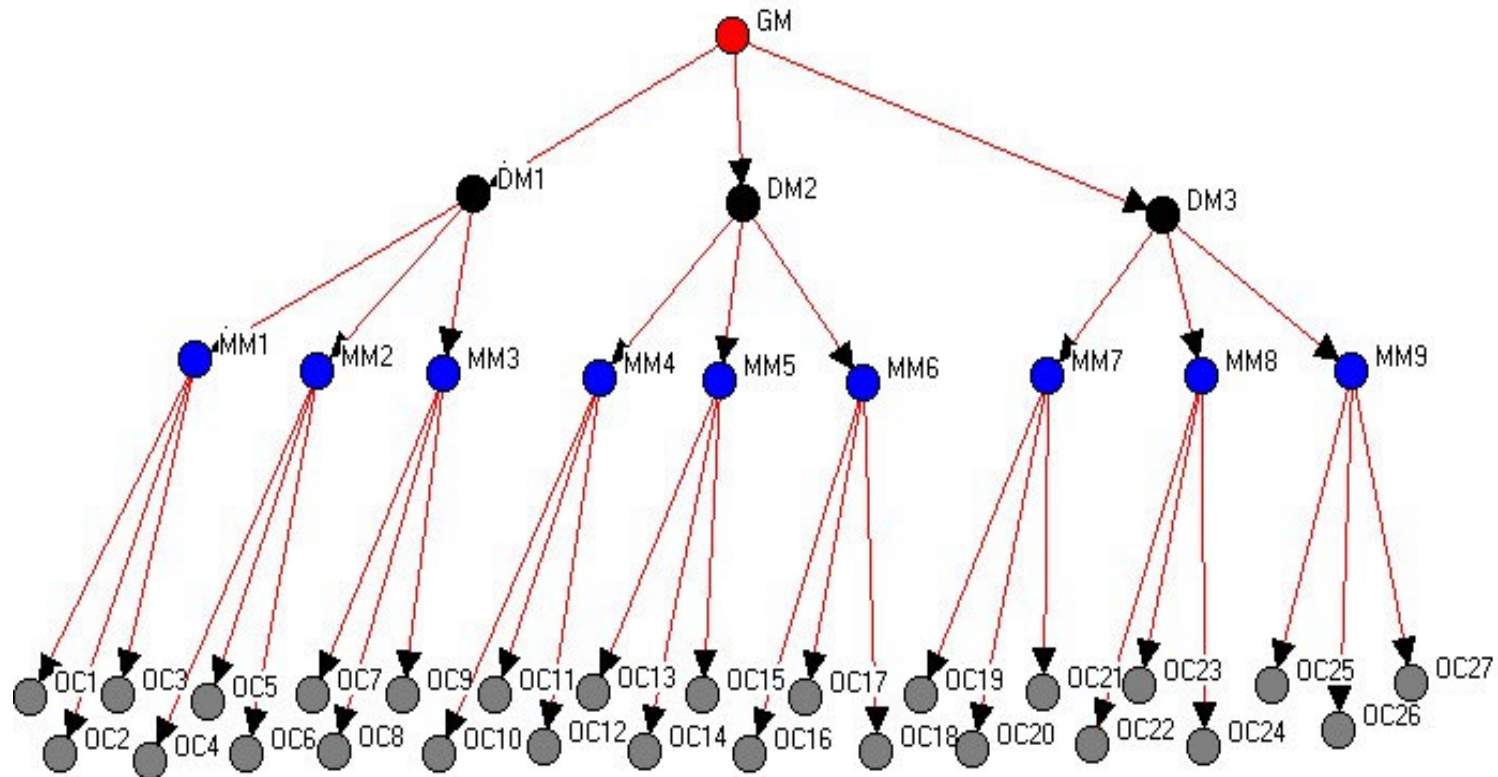
- The star form: one level outtree
- The org chart form: multi-level outtree
- Crucial questions:
  - Which one is more hierarchical?
  - Which node(s) get(s) more hierarchical power

# Star form

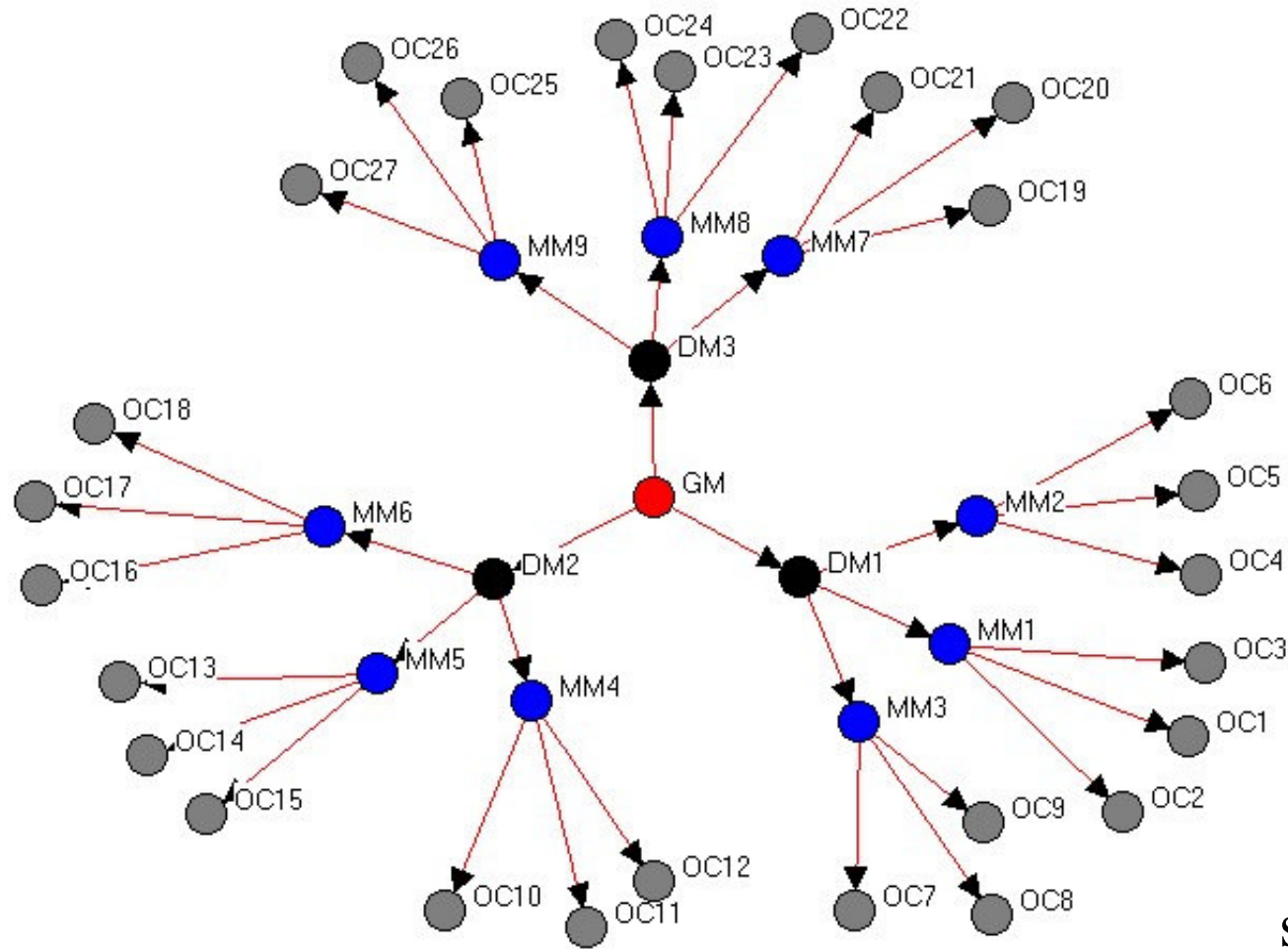


size: 40 nodes

# Org chart: multi-level outtree



# Org chart: multi-level outtree



size: 40 nodes

# Measures of formal hierarchy

- Number of ranks
- Number of levels (layers)
- Diameter (length of geodesics top-down)
- Number of geodesics top-down --> span of control
- Degree of asymmetry: graph hierarchy measure

# Graph hierarchy measures: degree of “outtreeness”

**Connectivity:** no isolated nodes

**Efficiency:** minimum number of links

**LUB (least upper boundedness):** every pair of nodes has a third node to whom they defer

**Degree of hierarchy (Krackhardt index (1994))**

$$H_k = 1 - (S/R)$$

where  $S = n^\circ$  of symmetric links

and  $R = n^\circ$  of all links

note: this index should be calculated on the derivated reachability digraph

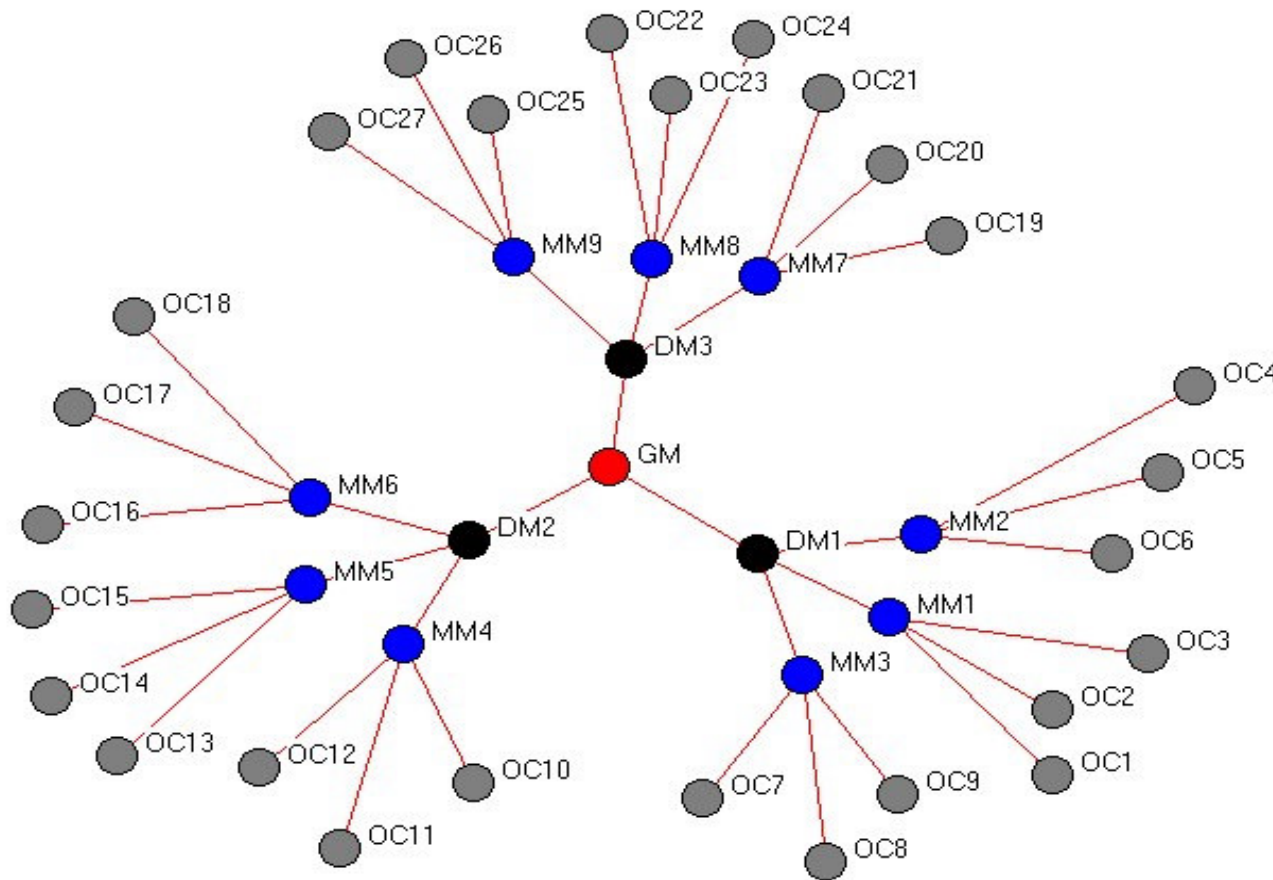
# Implications for understanding (measuring) post-fordism

- Organizational flattening would be measured by:
- Few ranks (short geodesics)
- High number of geodesics
- Modifying (leaving, cycling) the outtree by inserting integrating managers (project managers, product managers, area managers, etc.)

# Problems (especially with measuring informal hierarchy)

- What about the hierarchical power of single (group of) nodes?
- What about the hierarchical degree of non-directed graphs (organizations)?
- Is it useful and possible a measure of **structural (non-dyadic) hierarchy**?

Is it possible to measure the degree of hierarchy of this informal network?



## Surprising results applying the measures of structural (positional) hierarchy

- The **paradox of flattening**: the degree of hierarchy increases
- Flattening = increase of centralization
- Explanation: through flattening the span of control increases sharply
- Span of control = span of cognitive capacity
- Value (intensity, salience) of decision (hierarchical link)

# Hard methodological problems

- 1) how to compare structures through a grid of different independent indexes? A typical question of multicriteria evaluation
- 2) how to build the appropriate benchmarks of informal networks?
  - \* with the star is easy
  - \* with the org chart is hard because of individuating ranks and layers