

*Complexity Perspectives on Innovation  
and Social Change*

(Springer, 2008)

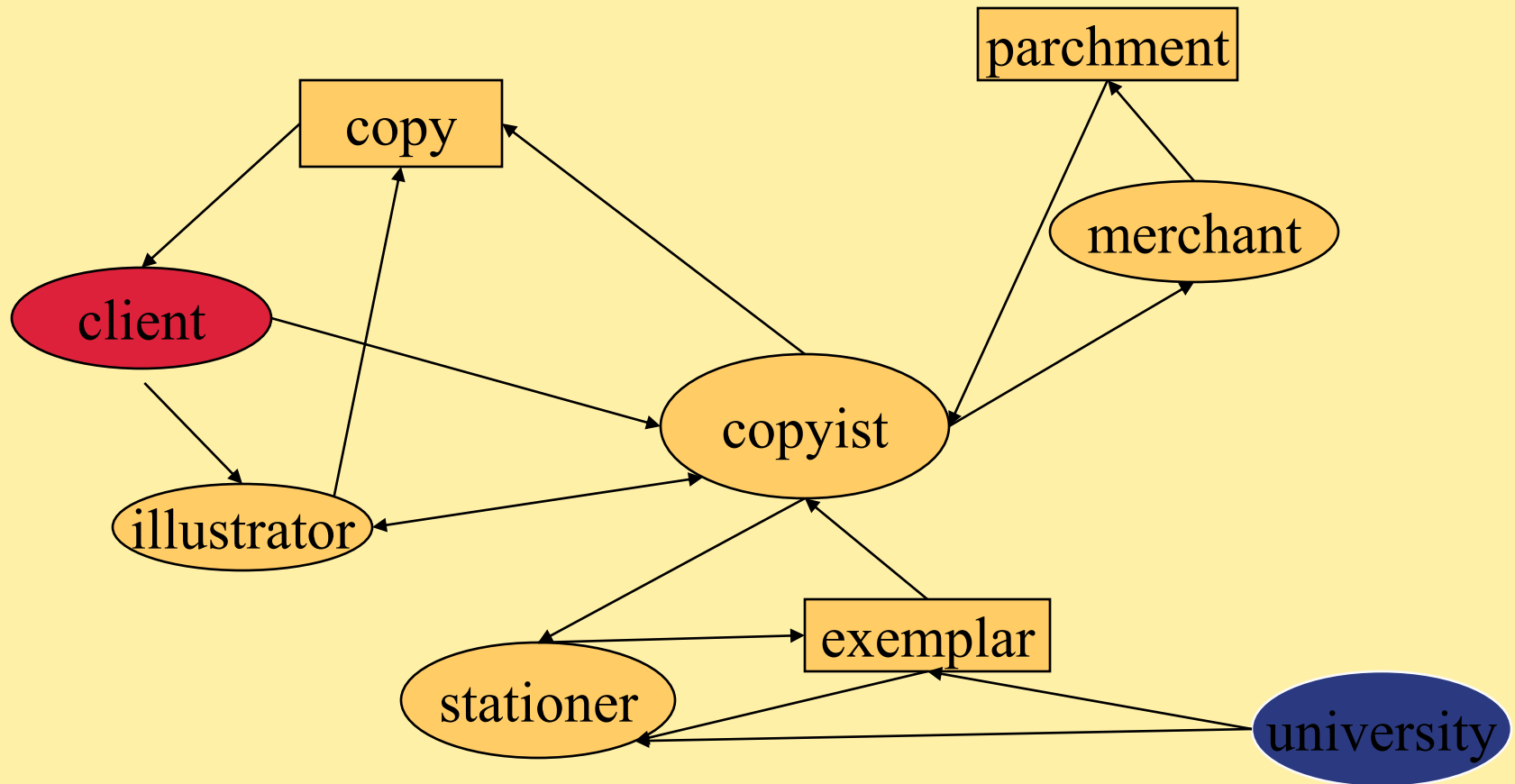
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West

Information **S**ociety as a **C**omplex System, FET FP-5

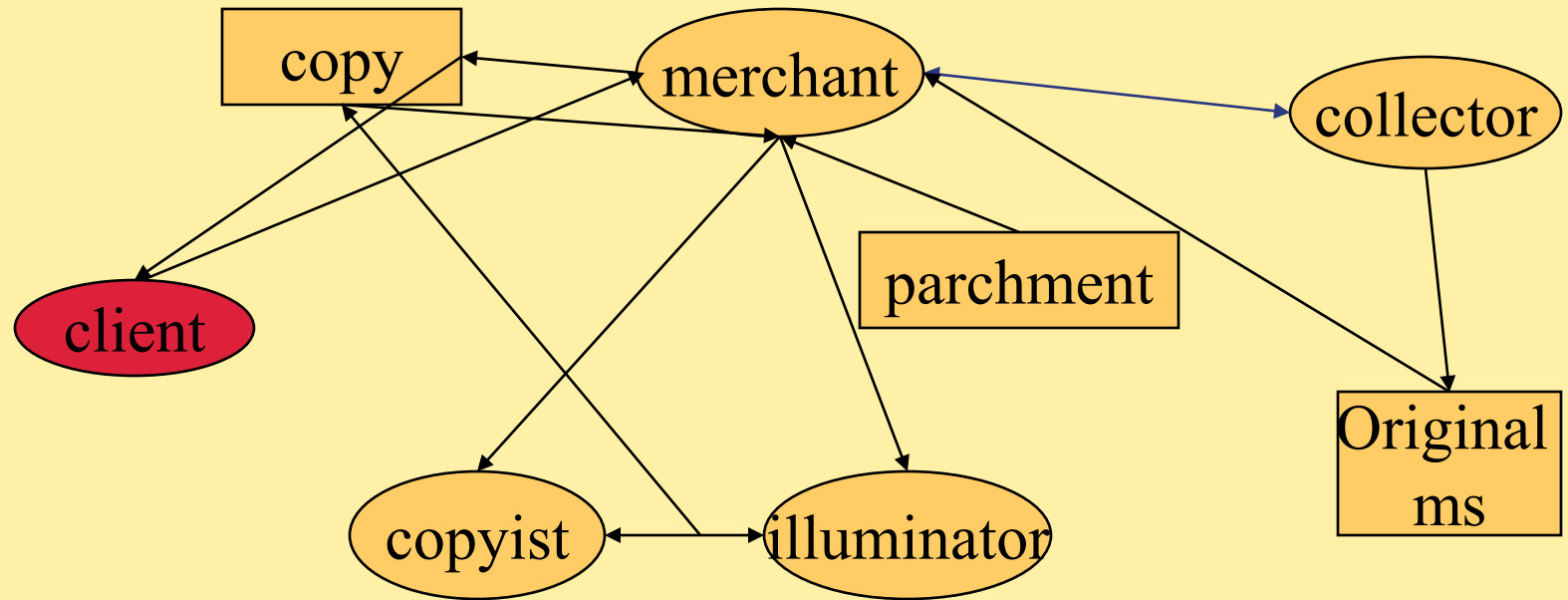
# Artifact histories

- All artifacts have a history -- as do the modes of interaction among people in which artifacts figure
- Aim: to develop a theory about the processes through which artifact histories are realized
  - How new artifact types come into being
  - How their tokens proliferate and become incorporated into ongoing patterns of human interaction
  - How **new** patterns of interaction among human beings are generated around artifacts

# Manuscript market system: Bologna, c. 1450



# Humanist manuscript market system c. 1450



*And if the copy was ready before the client came to the shop??*

# Two kinds of innovation

- Better-faster-cheaper
- New attribution of functionality

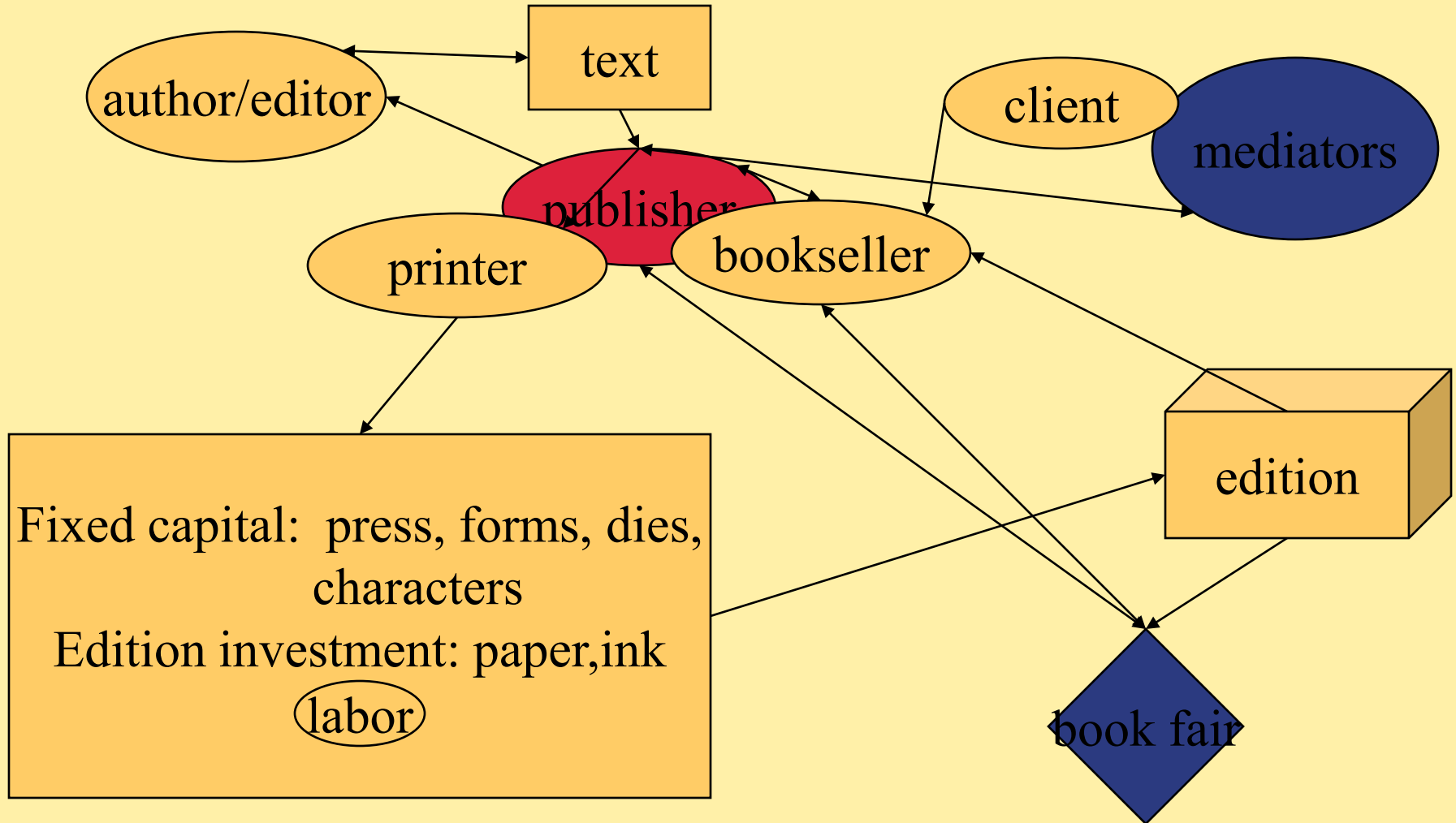
# Example 1: printed publicity

- Printing with movable type -- Mainz, 1450's  
*Gutenberg, Fust -- and Schoeffer*
- From indulgences to books -- and political broadsides
- 1460's: from commissions to direct sales to customers
- mid-1460's: printed advertisements (Schoeffer's catalogue, 1469) for traveling salesmen

# Reciprocity principle

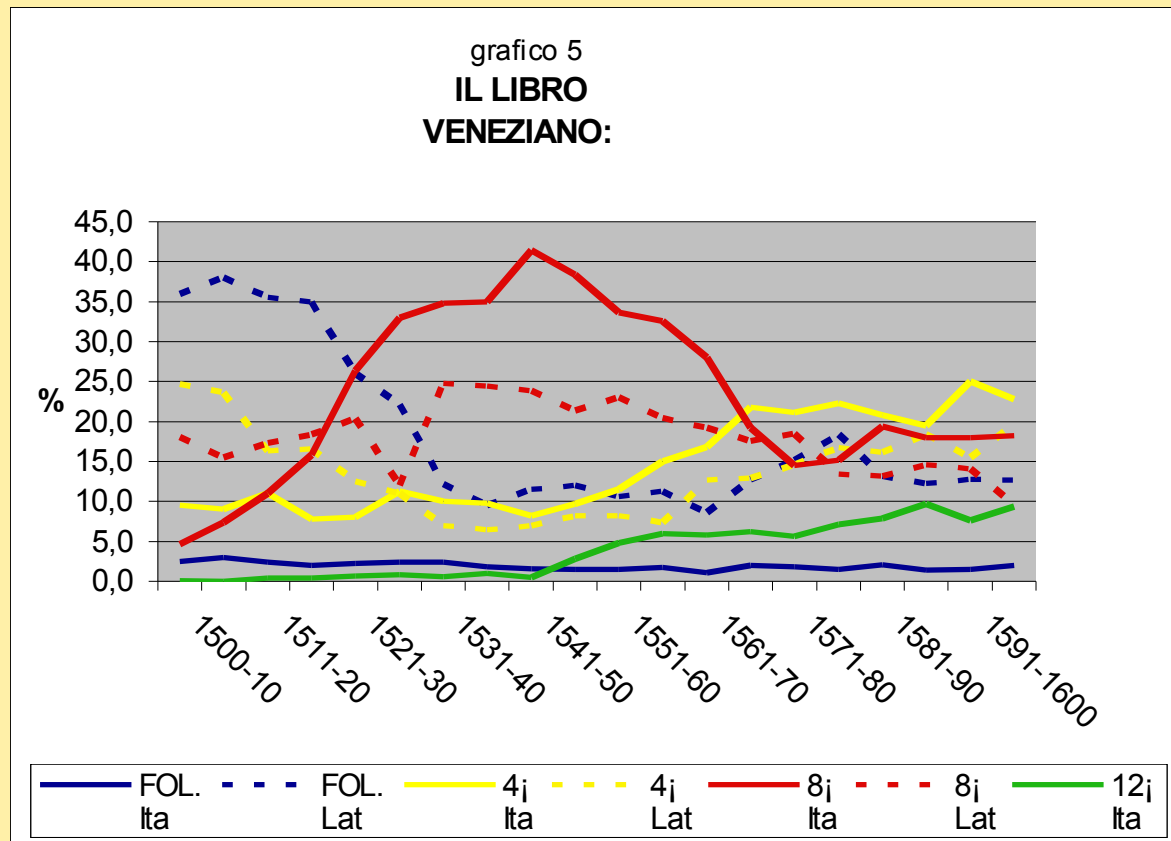
- Agents: human beings, or organizations “in the name of which” human beings act
- Artifacts: entities constructed by agents, for the use of agents      *material, informational, performative*
- Reciprocity principle: *the generation of new artifact types is mediated by the transformation of relationships among agents; and new artifact types mediate the transformation of relationships among agents.*

# Printed book market system, c. 1500





# Example 2: the rise and fall of the “Italian” ottavo in the 16th century



# Aldo Manuzio: projects and relationships

- The dream: Regenerating society through Greek philosophy
- The society: Manuzio, Torresano, Barberigo
- Manuzio and Pietro Bembo

# *Le Cose Volgare di Messer Francesco Petrarca, 1501*

- Redirection: reading as recreation
- Reading what, how?
- Some novelties:
  - Ottavo
  - Italics (Griffo)
  - Introduction + text, *no comments*
  - Punctuation: comma, period, apostrophe; non-Latinized spelling
  - Italian philology and the birth of a (dead) language  
*Prose della volgar lingua, 1525*

# Innovation cascade

- Ottavo italics *bfc, failed monopoly*
- New format -> new public -> new contents (*eg secrets, letters, almanacs*) -> new roles (*eg “poligrafi”, peddlars, book smugglers*)
- Debate on the identity of the Italian language (Castiglione and Machievelli vs. Bembo); Aretino and a living language
- The fall of the Italian ottavo: delocalization and the Counter-reformation

# Theory as ontology

- “Theory of innovation” an oxymoron?
- Aim to present an **ontology** for phenomena associated with artifact innovation
  - Kinds of entities
  - Interaction modalities
  - How entity properties change as a result of interactions
- Value of theory established and demonstrated through dialogues
  - With historical narratives
  - With mathematical models

# Relations in agent-artifact space

- Horizontal and vertical relations
- Network ties
  - Agent-agent: recurring patterns of interaction, directed towards transformations of artifacts, artifact relations, or agent-artifact relations **permissions**
  - Agent-artifacts: relations of production, ownership, use
  - Artifact-artifact: functional, genealogical
- Recursive structures (*level hierarchies*)

# Organization in agent-artifact space: market systems

- Competence networks *information, interpretation, production, distribution...*
- Scaffolding structures *formation, maintenance, reconfiguration of competence networks; interaction loci, aligning attributions*

# The locus of new attributions: generative relationships

- Ontological uncertainty
- Generative potential
  - Aligned directedness
  - (Attributional) heterogeneity
  - Mutual directedness
  - Permissions
  - Action opportunities



# Positive feedback dynamics: exaptive bootstrapping

- New artifact types *designed* to instantiate a particular attribution of functionality
- Organizational transformations constructed to proliferate use of tokens of new type
- Novel patterns of human interaction emerge around these artifacts in use
- New attributions of functionality generated