Transaction Cost Allocation in Industrial Symbiosis: A Multi-agent Systems Approach

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Background

- **Industrial Symbiosis (IS):** The process by which wastes or by-products of an industry or industrial process become the raw materials for another.
- **Multiagent Systems (MAS):** Consists of a set of semi-autonomous entities, called agents, which interact with each other and their surrounding environment to achieve their objectives.

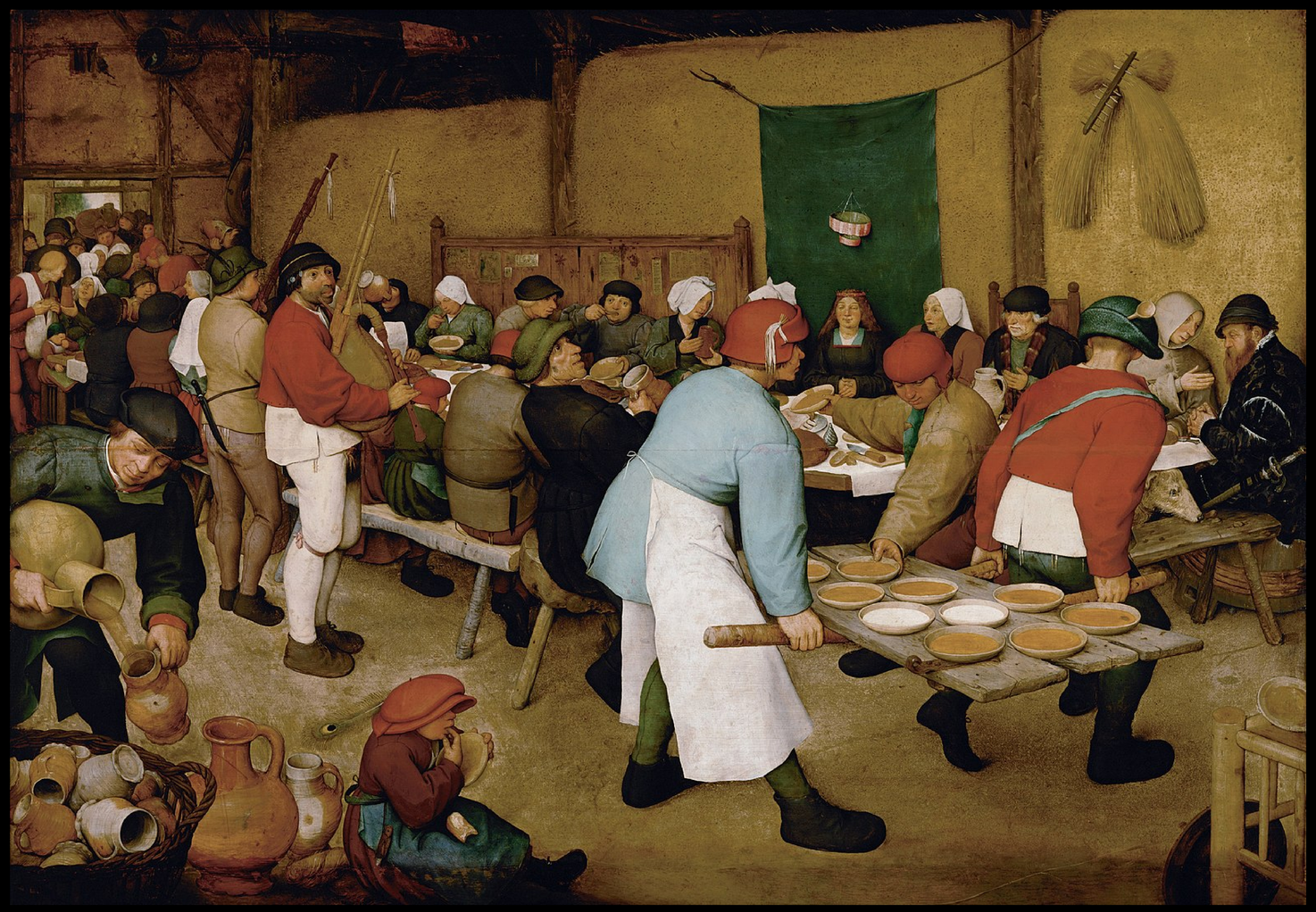
Approach

- **Main Objective/Result:** to develop a *fair and stable* transaction cost allocation mechanism for IS.
- **Applied Methodology:** we apply John Searle's distinction between *physical and institutional facts/acts* for reasoning about transaction costs. Building on this, we use *graph theory* and *game theory* to formulate our *transaction cost allocation mechanism* for IS.

Contribution

This work is the first proposal that:

- translates Searle's philosophy on institutional theory for the context of IS,
- takes it into practice for fair transaction cost allocation,
- introduces a tractable algorithm for allocating costs in IS.



A method to learn **who**, to what **extent**, should **bear the cost** in:

- the Peasant Wedding,
- this industrial symbiosis,
- or that circular supply chain.

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Painting: "*Peasant Wedding*" by Pieter Bruegel the Elder (Kunsthistorisches Museum, Vienna)