

Intellectual capital creation in regions: A knowledge system approach

Aino Pöyhönen & Anssi Smedlund

The First World Conference on
Intellectual Capital for Communities

June 20, 2005, Paris

IC creation in regions

- IC is an important determinant of regional competitiveness
 - Regional competitive advantage is created in inter-organizational networks
- ⇒ How IC is created in inter-organizational networks within a regional cluster
- = Processes and relational patterns by which intangibles are leveraged, acquired and created

Research gaps

- Most research on IC of individual firms
=> regional / national level IC
- Most IC research interprets knowledge in terms of static intangible assets
=> dynamic processes by which IC is created
- Most research on existing, actualized IC
=> future potential

3 approaches to intellectual resources

| Approach | ASSET APPROACH | CAPABILITY APPROACH | RELATIONAL APPROACH |
|-------------------------|---|---|---|
| Knowledge understood as | Possession or property | Ongoing, emergent process | Socially constructed and shared resource |
| Main interest | Identification and valuation of existing intangibles | Capability to create, develop and modify intangibles | Social relationships and interaction |
| Focus on | Investments, IPRs, human capital, structural capital, customer / relational capital | Adaptive and self-generative capability of the unit of analysis | Characteristics of the social relationships connecting the actors and social capital embedded in them |

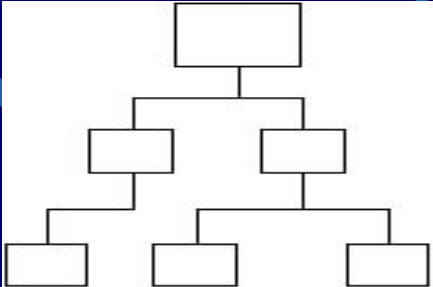
The systemic viewpoint: combining capability and relational approaches

- System = a complex network of interrelationships
 - Actors, links, flows, management
 - Emphasis on connections and interaction
 - Socio-centric view
- ⇒ How to organize networks for optimal IC performance?

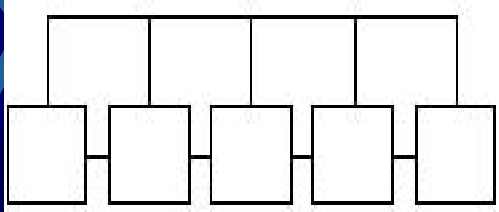
3 IC functions

1. Implementing knowledge
2. Transferring knowledge
3. Creating knowledge
 - Each requires different mode of organizing
 - 3 ideal types of networks:
 - Production network
 - Development network
 - Innovation network

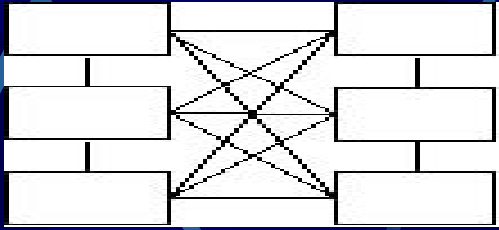
Production network

| | |
|------------------|---|
| Illustration |  |
| Benefit | Lowers transaction costs by allowing actors to concentrate in their core competencies |
| IC function | Knowledge implementation |
| Competence | Explicit, defined |
| Relationships | Determined by hierarchy |
| Information flow | One-way, top-down |
| Management | Authoritarian leadership, direct use of power |

Development network

| | |
|------------------|---|
| Illustration |  |
| Benefit | Increases learning through trust and communication |
| IC function | Knowledge transfer |
| Competence | Tacit, experiential, hidden |
| Relationships | Reciprocal, synergistic |
| Information flow | Multi-way, horizontal |
| Management | Dialogue, empowerment |

Innovation network

| | |
|------------------|---|
| Illustration |  A diagram illustrating an innovation network. It consists of three vertical columns of rectangular nodes. The nodes in each column are connected to each other and to nodes in the other two columns, forming a dense, interconnected web of lines that represents the network structure. |
| Benefit | Enables continuous innovation by combining different actors and resources |
| IC function | Knowledge creation |
| Competence | Intuitive, potential |
| Relationships | Abundant, spontaneous |
| Information flow | Chaotic, sporadic |
| Management | Networking skills, relinquishing power |

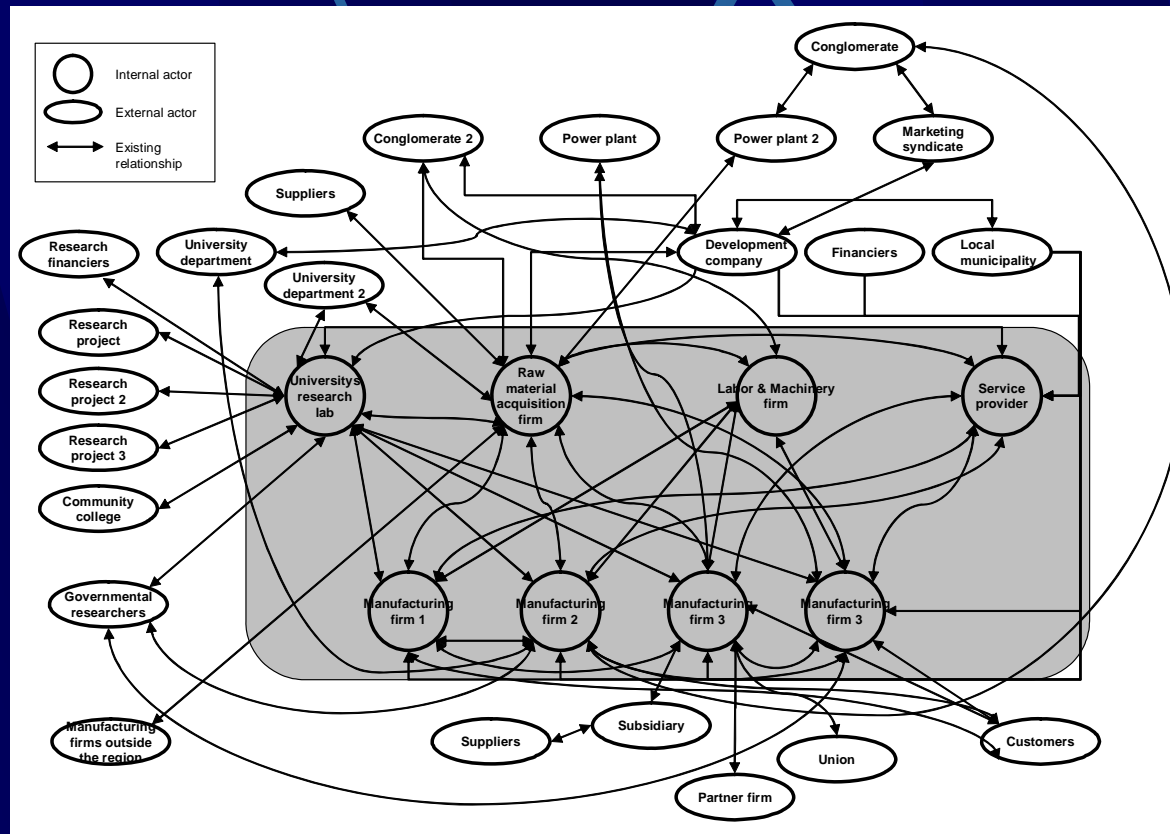
The case

- Young regional cluster of small firms in mechanical wood processing industry in Eastern Finland
- 8 main / internal actors:
 - 4 manufacturing firms
 - raw material acquisition firm
 - labour & machinery rental firm
 - service provider
 - university research lab
- External actors

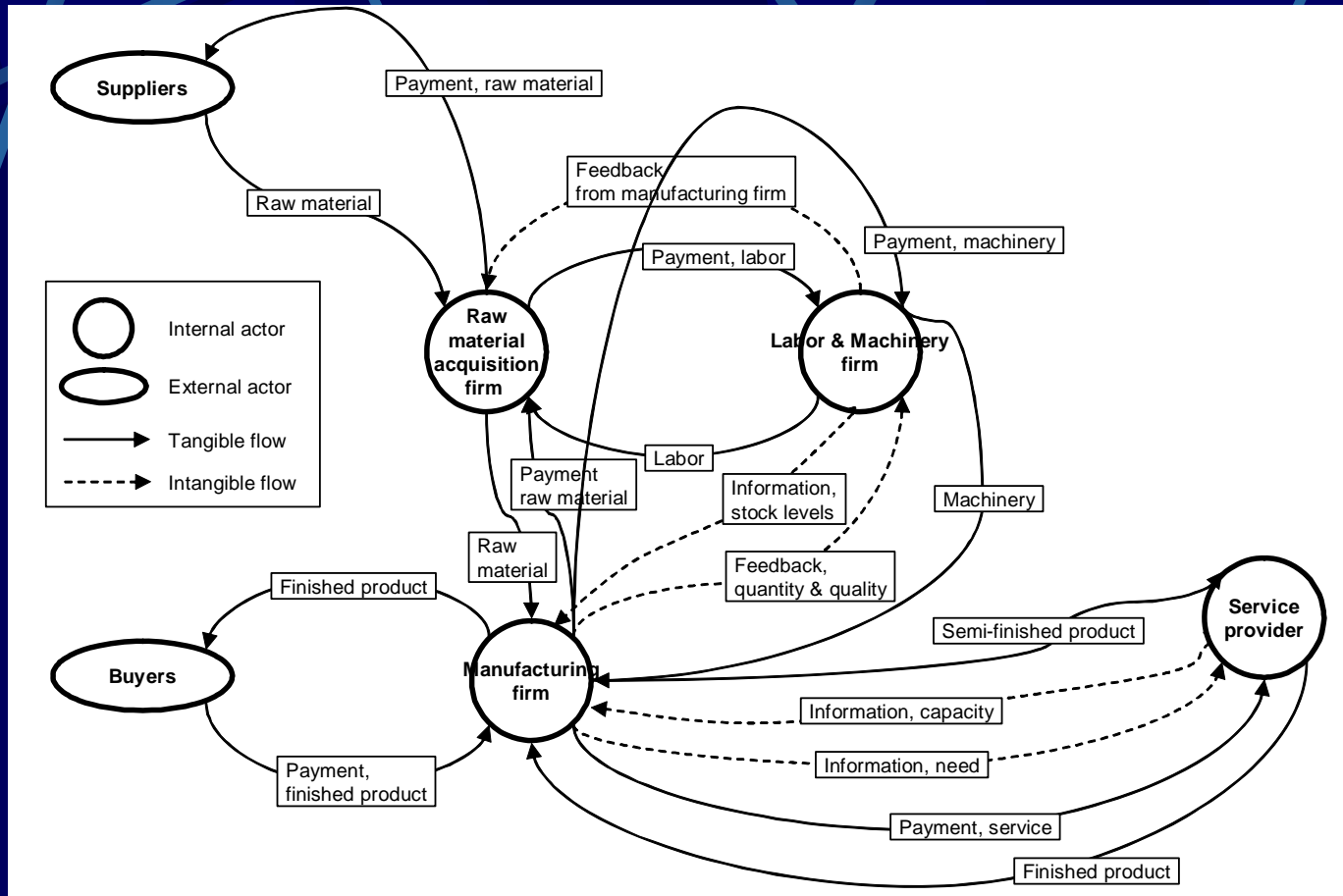
Methods

- Theme interviews of representatives of all main actors in the cluster, $N = 11$
- Network graphs (Allee 2000, value network model)
- Site visits

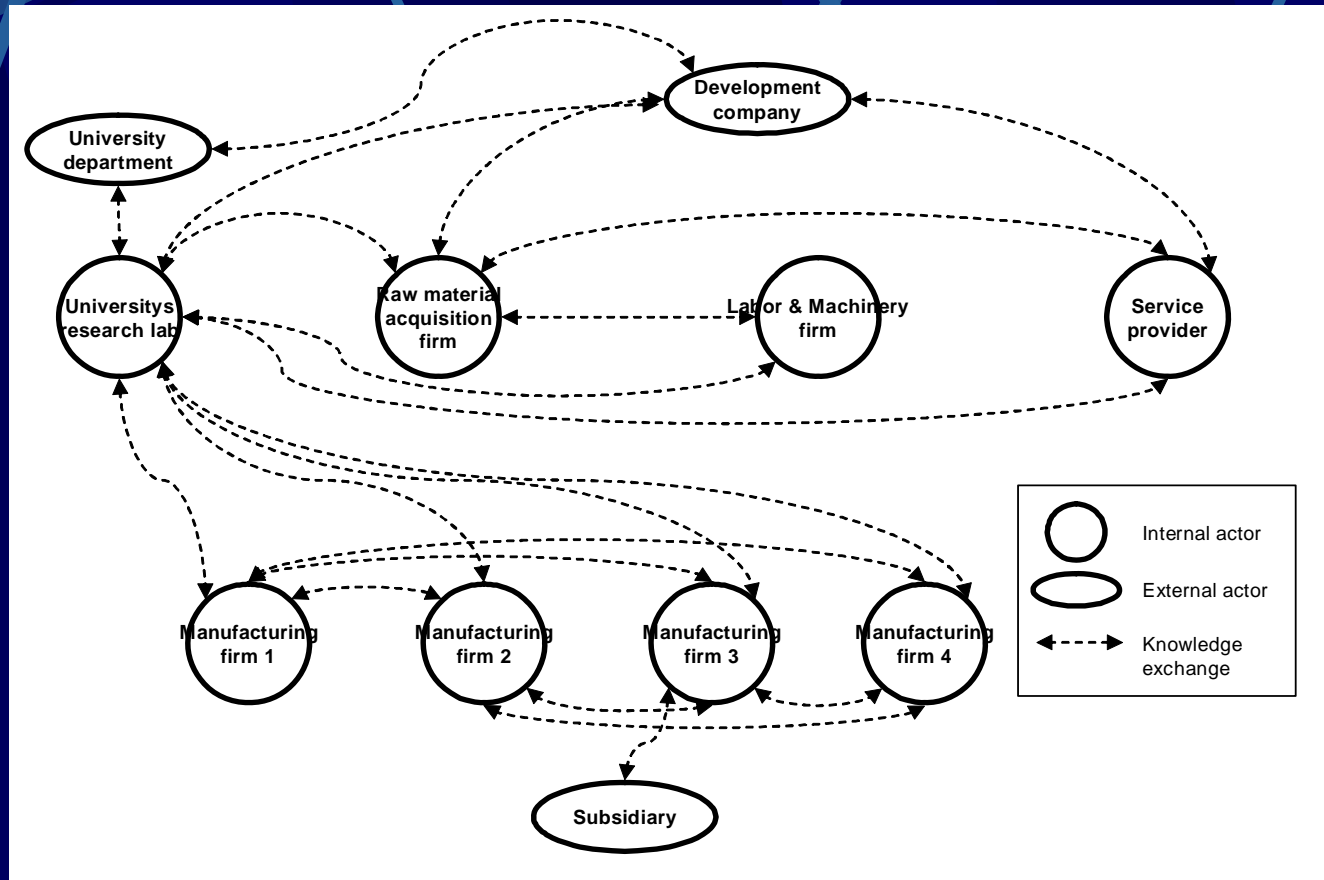
The case regional cluster



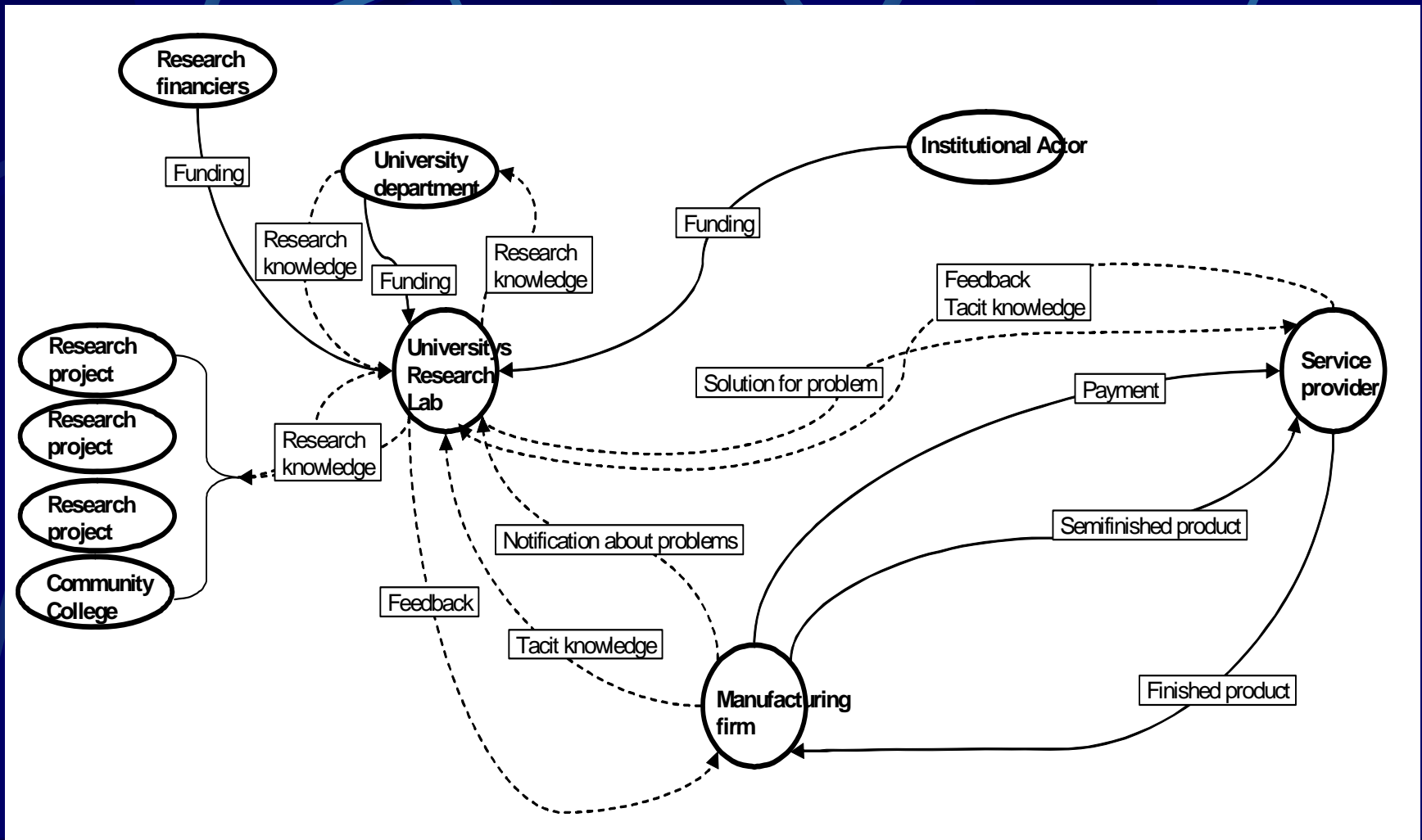
Production network illustration



Development network illustration



Innovation network illustration



Strategic IC management in the case cluster

- 3 main strategic goals of the cluster:
 - 1) Increase efficiency of raw material flow
 - 2) Form a united market force
 - 3) Invent new production methods

To achieve these, the cluster needs to contain all 3 types of networks

=> Combining efficiency and innovation

Production network assessment

| Element | Criteria | Case |
|--------------------------|---|--|
| Knowledge and competence | Defined, explicit | Actor's core competences and internal production processes not clarified |
| Relationships | Clear contracts | Agreements between focal company and subcontractors unclear |
| Information flow | One-way, top-down | Stock level information not circulated to all relevant parties |
| Management | Focal company's orders, direct use of power | Raw material acquisition firm has too much power over manufacturing firms' processes |

Development network assessment

| Element | Criteria | Case |
|--------------------------|-------------------------------|--|
| Knowledge and competence | Experiential, hidden, tacit | Formation of mutual tacit knowledge has not begun yet |
| Relationships | Reciprocal, seeking consensus | Lack of trust between some actors |
| Information flow | Multi-way, horizontal | There are two separate cliques which do not communicate directly |
| Management | Dialogue, empowerment | Institutional actor has the leading position |

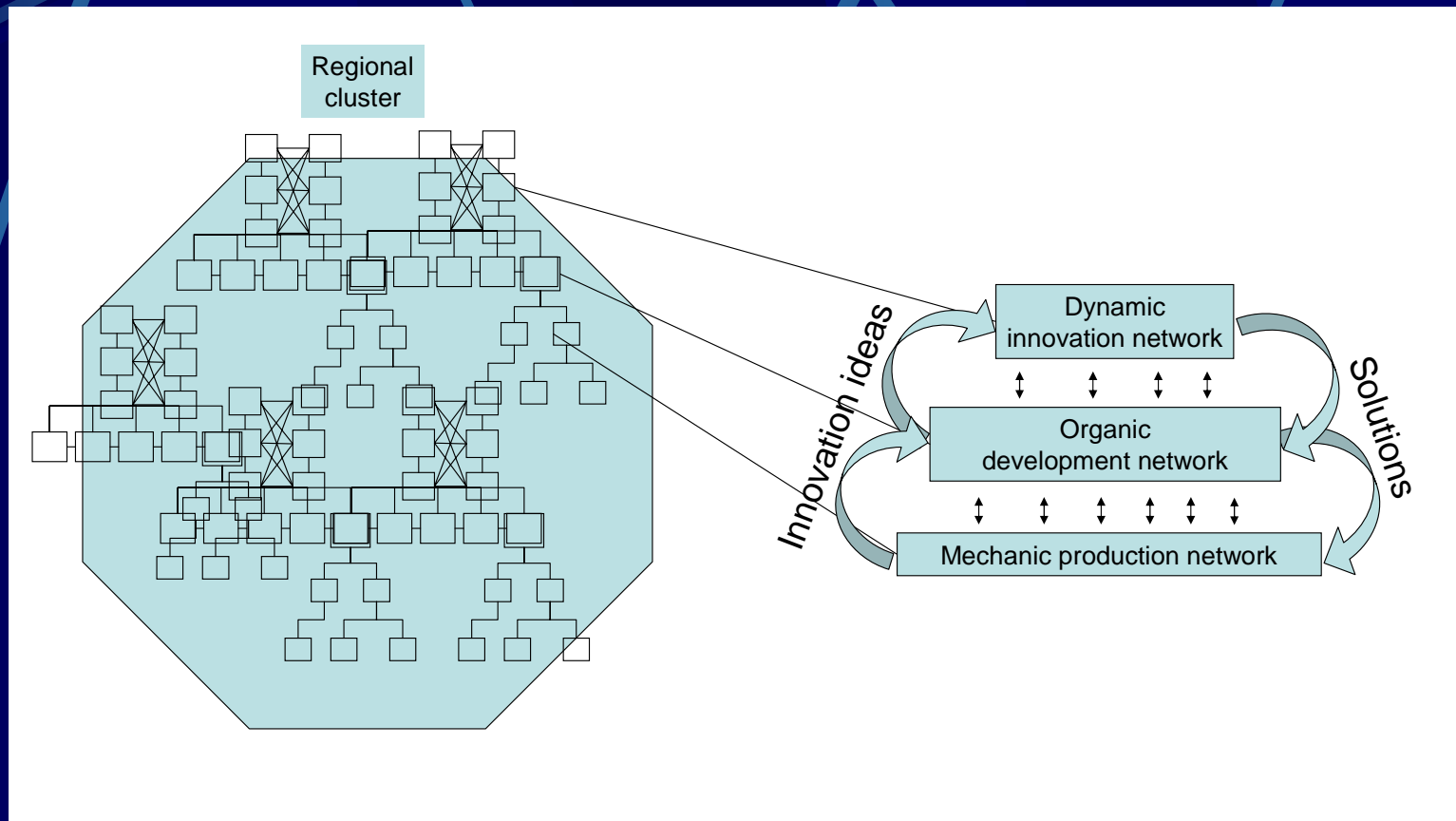
Innovation network assessment

| Element | Criteria | Case |
|--------------------------|---|---|
| Knowledge and competence | Emergent, potential, multi-faceted | Tacit knowledge of diverse actors is combined with theoretical research |
| Relationships | Spontaneous, abundant | Plenty of personal and casual relationships |
| Information flow | Entropic, fast | A lot of real-time communication and problem-solving |
| Management | Authority migrates according to expertise | Research lab coordinates innovation processes |

The regional knowledge system

- Regional IC creation takes place in 3 types of networks:
 1. Production network = knowledge implementation
 2. Development network = knowledge transfer
 3. Innovation network = knowledge creation
- To be successful, a region needs all 3 types of networks
- An actor can belong to several networks

Dynamics of the regional knowledge system



Conclusion

- IC of regional clusters is created in 3 types of inter-organizational networks
 - Each is apt for creating certain type of knowledge-based competitive advantage
 - Distinct operational logic and effectiveness criteria
- The model presented enables:
 - Improved understanding of complex knowledge processes in large aggregates
 - Identification of strengths and weaknesses in the operation of regions and networks
 - Strategically focused IC management of regions and networks