

# **The dynamism of clusters:**

## **From abstraction to *actant***

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# The aim of the paper

Develop a **relational framework** that can provide analytical guidelines for understanding clusters and clustering processes as **social constructed complex phenomenon** without loosing sight of the **material dynamism** of cluster development

*Can ANT (Actor Network Theory) be a tool for such purpose?*

The discussion illustrated through two case studies:

- The subsea cluster** in Hordaland (Western Norway)
- The maritime cluster** in Møre (Western Norway)

**Data:** suveys, interviews, existing analyses etc

# What is Actor-Network Theory?

- Attempts to explain what happens in the world by exploring the **myriad connections of actors in various networks** (Latour 1996)
- The development of **organisations and systems** are understood as **effects of relations** enacted through **networks** of humans and non-humans / material and non-material
- ANT provide a means of navigating **dualism** between the material (agglomerations) and immaterial (representations) (Murdoch 1997)
- Intend to trace the **heterogeneity** of phenomenon (Bosco 2006)
- Emphasise the constant **circulations** and flow of actors and network (dynamism)

# What is Actor-Network Theory?, cont.

-ANT study the world as performance / as effects of relations:

→ how different **actants** emerge out of different relations/networks and give rise to constantly changing actor networks and different relations of power (Bosco 2006).

An actant: “...something that acts or to which activity is granted by others ... An actant can literally be anything provided it is **granted to be the source of action**” (Latour 1996: 373)

*-An actant can be a phenomenon constructed by practice/relations and which are guiding/influencing future practice/relations*

# A cluster as an *actant*?

- Cluster theory has emphasised the **economical advantages** of being located in a cluster (Porter 2000, Gertler and Wolfe 2007):
  - provides firms with easier or cheaper access to **specialized inputs** (components, services, personell etc)
  - production and flow of new knowledge is most effectively when actors are located close to each other (**spill-overs**)
  - rivalry, complementarity and demanding customers
    - *firms within a cluster are **more competitive** then firms on the outside*
- Porters originally definition of a cluster is **vague** (Asheim et al 2007, Martin and Sunley 2003).

# Cluster theory

- Malmberg and Power's (2007) *true cluster* includes three main criteria's:
  - i) A spatial agglomeration of similar and related economic activity (**agglomeration**)
  - ii) These activities should be interlinked by relations and interactions of local collaboration and competition (**networking/inter-input output linkages**)
  - iii) A form of self-awareness among the cluster participants and some joint policy action (we are a cluster and we are determined to develop together) (**representation**)

# Cluster theory and policy

- The idea of a (dynamic) cluster has been attractive for **policy makers**
- Numerous policy programmes and instruments have been informed by Porters idea of the dynamic industrial cluster
- Regional and national authorities are **under pressure** to find clusters to avoid to be left behind in the new knowledge driven economy.
- The rush to **promote cluster development** has caused a lack of more fundamental and empirically based discussions on the content and the operation of a cluster (Martin and Sunley 2003).

# From cluster to actant

The emphasise within the literature has been on how locating in a cluster can solve (economical) **tasks** for the cluster participants (firms)

We will argue that different actors associate **various tasks and representations** both to the cluster as an abstract concept and to clusters in concrete:

- Firms**: increased innovation and profit
- National authorities**: improve innovation capacity and strengthen the international competitiveness of the economy.
- Regional/local authorities**: promote regional development
- Public innovation companies**: dynamic cluster as best practice examples for other regions
- R & D institutions**: looks to clusters for industry partners in innovation projects
- University colleges**: cluster firms as career possibilities for graduated students or as customers for short time courses
- Cluster researchers**: cluster definitions / understand cluster development
- etc.....**

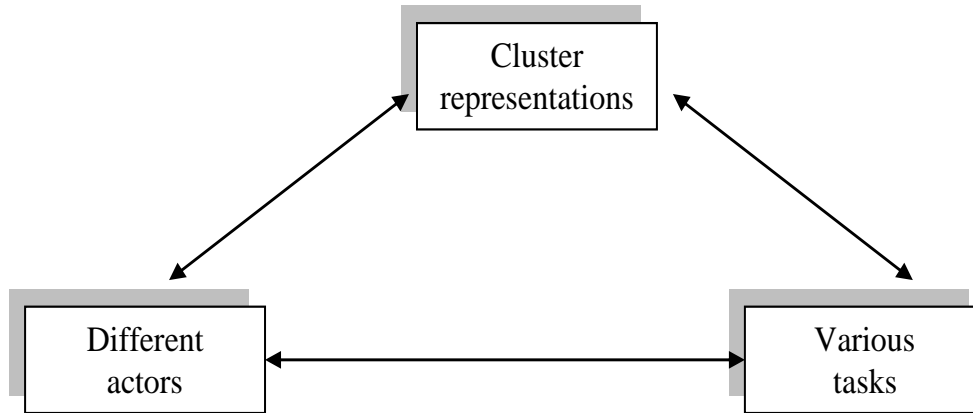
# Cluster as an actant

*Latour (1996:373): "...An actant can literally be anything provided it is granted to be the source of action"*

- The fact that cluster is given **multiple representations** and are expected to solve **multiple tasks** points towards an understanding of cluster as an actant
- Clusters (or the idea of a cluster) clearly **influence the practice** of actors within and around the cluster
- Cluster as an actant implies a stronger emphasise on the **cognitive dimension** (narratives, representations)

**Our definition of clusters as an *actant*;**

*"a relational complex of **actors, representations and tasks**"*



- Involved actors want to solve different tasks
- Their representation of the cluster will also differ
- The tasks can sometimes be contradictory and in conflict
- The tasks can also be overlapping and in harmony.

# The maritime cluster

## Agglomeration

- Located in Møre and Romsdal (Western Norway)
- Approximately 200 companies (2009): shipping companies (17 companies), shipyards (13), ship design consultants (12) equipment suppliers (159)
- Number of man years: about 20 000 (2008)
- Turn over: about 50 billion (2008)  
→ doubled since 2005

# Martime cluster, cont.

## Networking / input-output linkages

- The interplay between shipyards, shipping companies, equipment producers and ship consultants has been intensified over the last years.
- In 2006 42 per cent of the value of ship–building contracts for shipyards in the cluster was from ships delivered to the 14 ship owners in the cluster (22 per cent in 2002).
- For these 14 ship owners this local supply of new ships covered over 76 per cent of their total expenditures on new ships (62 per cent in 2002).
- The ship consultants contracts to local firms is amounting to 38 per cent of their turn–over (2007)

# Martime cluster, cont

## Representations / identification

- Regarded as the most complete cluster in Norway and world-wide leading in the offshore service sector (Hervik et al 2007)
- Actors within the cluster stress that especially **horizontal networking** has been vital for innovation.
  - The cluster has traditionally been characterised by widespread formal and informal contact between equipment producers, shipping companies, shipyards and designers.
  - The cluster is working through **extensive flow of knowledge** in day to day practical work and through many social networks
- The cluster has been widely associated with endogenously driven cluster dynamics and growth processes →created from below
- Those responsible for developing public cluster programmes are using the maritime cluster as an ideal model for how a dynamic cluster is expected to work

# The subsea cluster

## Agglomeration

- During the last couple of decades a new technological frontier has been explored in the extraction of oil and gas → *the use of subsea wells*.
- Oil and gas is being transported through pipelines on the seabed, and at present one third of the exploitation at the Norwegian shelf are through the use of such subsea wells.
- In Hordaland (Western Norway) → a large numbers of firms specialised in the subsea technology.
- These firms is mainly into maintenance, modification and operation of subsea installation
- The cluster consist of 161 firms with a total turnover of 11.6 billion (2008), about 4100 employees (the turn over has doubled since 2005)
- Small, medium sized and large firms (less then 10 man years in 39% of the firms)
- 51% of the firms established before the turn of the century
- In 61% of the firms the majority interest in the firm are held by individual/organisation loked in Hordaland. 14% are foreign owned

# The subsea cluster, cont.

## Networking / input-output linkages

- 32% of the firms have their most important provider of machinery within the region, while 30% have their most important provider of components within the region.
- Customers in other parts of Norway is slightly more important as collaboration partners in innovation processes than customers in the region (51% vs 41%)

Table 1 Strength of relations for firms in the subsea cluster in Hordaland\* (N=74)

	All firms	Firms established before 2000	Firms established during the 2000s
Towards other actors in the subsea cluster in Hordaland	4,24	4,45	4,24
Towards actors within the subsea sector located other places in Norway	3,96	4,28	3,59
Towards actors in other parts of the petroleum industry in Hordaland	4,62	4,85	4,35
Towards actors in the petroleum industry located other places in Norway	4,36	4,72	3,94

Note: \*) Firms have reported strength of relations on a scale from 1 (no relations) to 7 (strong relation). The table gives average score.

# Subsea cluster, cont.

## Identification / representation

- 30% of the firms reported that they were stressing their location in the subsea cluster in Hordaland in their marketing efforts.
- 25% of the firms reported that their firm was associated with “the subsea cluster in Hordaland”.
- Local and regional authorities promote the subsea milieu as a “highly dynamic and international oriented cluster”
- In 2006 the milieu was granted the status as NCE (Norwegian centre of excellence) by Innovation Norway (a public innovation company); implies that the subsea agglomeration in Hordaland is regarded as “one of the most dynamic clusters in Norway”
- The NCE status triggers public support for a 10 year period to facilitate networking and innovation among the subsea firms

# Cluster as an operating actant

## i) Various representations within a cluster

- Martime; “regional cluster” vs “globalising environment”
- Subsea; “firm internationalisation” vs “regional development”

## ii) The fluidity of representations

- new ideas on cluster development is being promoted
- the importance of extra-local linkages →  
Subsea; a challenge,  
Martime; a threat and a challenge

## iii) The cluster as a social construction

- Ideal model for cluster growth → The martime cluster as blueprint for other “clusters”

# Cluster as an operating actant, cont

## **iv) Cluster development as a combination of bottom up and top down (planned) development:**

- Martime: development from below, cluster program to facilitate further growth
- Subsea: the idea of clustering is introduced by external actors (public authorities, innovation companies)

## **v) Power relations are enmeshed in the cluster**

- Martime: firms strong identification with the cluster to a certain degree restrict their practice (local actors)
- Subsea: identity formation is mainly being encouraged by public authorities/innovation companies/cluster facilitator

# What is ANT adding to cluster studies?

- The heterogeneity of cluster practice
- The dynamics of cluster development (changing representations and practice)
- The interconnection between traded (networking/linkages) and untraded (representations) interdependency

*ANT is an evolving approach;*

- have different meaning for different people
- needs to be refined and developed through practical research
- have a potential for adding new perspectives

