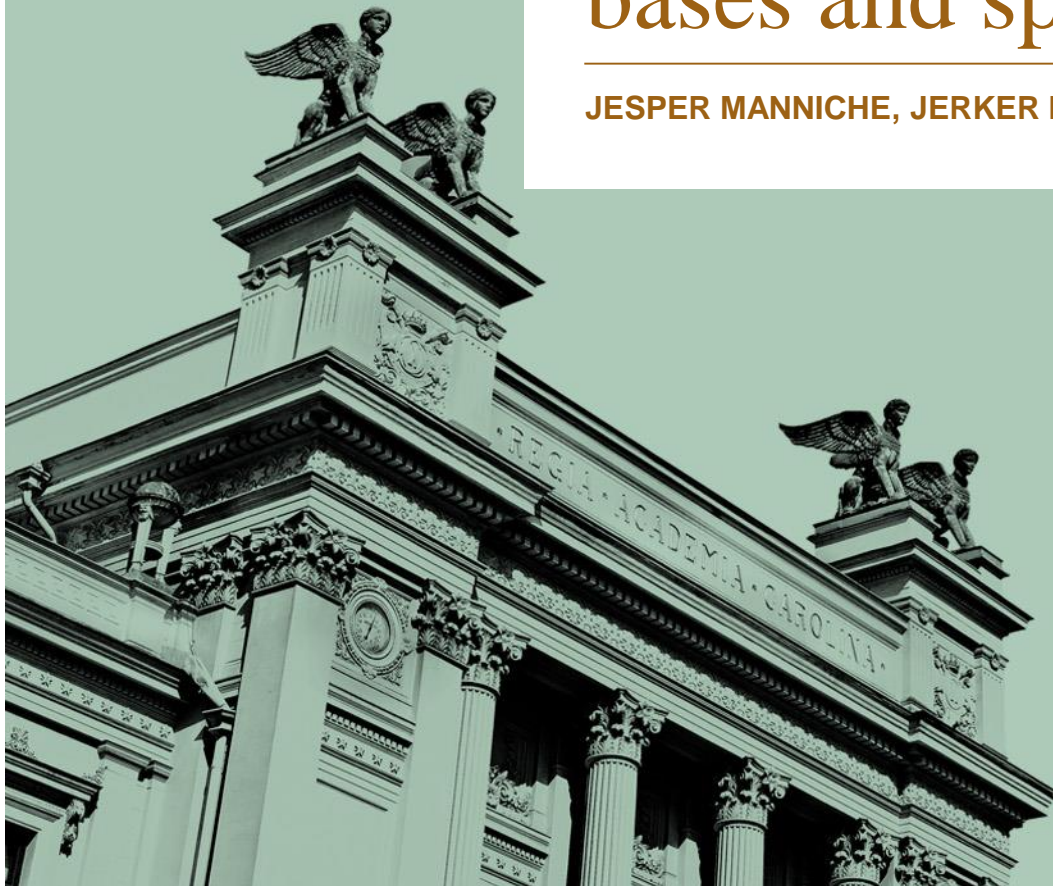




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# Combinatorial knowledge bases and spatial dynamics

JESPER MANNICHE, JERKER MOODYSSON, STEFANIA TESTA



# Heterogeneity

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- Innovation processes differ in many respects according to the economic sector, field of knowledge, type of innovation, historical period and country concerned. They also vary with the size of the firm, its corporate strategy or strategies, and its prior experience with innovation. In other words, *innovation processes are "contingent"* (Pavitt, 2005, p. 87).
- Much research focuses mainly on sector specificities. A widespread approach has been the "Pavitt taxonomy".



# Pavitt's taxonomy

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- Focus on industry level – firms grouped together into an industry on the basis of their main output. Builds on established sector classification system (SIC/NACE etc)
- Two step classification: firms firstly attributed to an industry according to their main product, and subsequently the whole industry is attributed to a class of the taxonomy
- Empirically based (inductive) classification based on 2000 innovations in the UK 1945-1979



# Problems with Pavitt/sectors

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- The existence of multi-product and multi-technology firms
- Platform technologies and emerging sectors – new “sectors” continuously born (e.g. ICT, life science, new media etc)
- Modes of innovation differ substantially between firms *within* sectors (Leiponen & Drejer, 2007)
- Large categories of firms with very similar modes *across* sectors (Srholec & Verspagen, 2012)



# Knowledge bases?

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- (How) can the KB approach help us better understand the relation between knowledge content, modes of innovation, interaction, and importance of proximity between firms, universities and other actors involved in innovation processes?
- (How) can the KB approach help us better understand innovation processes carried out by firms and related actors working with different types of economic activity?
- (How) can we better specify firms/activities according to the KB approach?



# The KB typology

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Analytical	Synthetic	Symbolic
Understand and explain features of the (natural) world by application of scientific principles	Construct solution to functional problems/ practical needs by combining knowledge and skills in new ways	Trigger reactions (desire, affect etc) in minds of beholders by use of symbols and images

## Focus on the process rather than the outcome

- Theoretically derived concepts rather than empirical cases
- Accentuates characteristics not necessarily found clear cut in reality
- Innovation processes draw on combinations of all three knowledge bases



# Aim with paper

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- Further develop the KB typology as a research tool for describing the realities of innovation processes over time
- Develop a method for analyzing innovation processes and their sub-sequences
- Provide examples of usefulness and applicability of the typology and method



# Innovations

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- New creations of economic and/or societal significance, a result of three intertwined processes
  - intra- and inter-organizational processes of creating and validating new knowledge
  - managerial-organizational processes through which the innovating organization coordinates, combines and exploits the outcomes of such knowledge dynamics
  - spatial and institutional contexts framing and affecting these organizational processes
- The knowledge biography method intends to capture this totality





# A knowledge biography approach (I)

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## **Overall rationale/research objective:**

To decompose and reconstruct the knowledge dynamics related to the life-span processes of innovations of firms in order to disentangle the contribution to the innovation by varying types of knowledge, communities, and contextual factors (including territorial).

Combining quantitative and qualitative data about knowledge dynamics including:

- Time and space dimensions
- Epistemology (DKBs)
- Participating actors
- Contextual frameworks
- Etc.

Integration of micro, meso and macro dimensions of innovations



# A knowledge biography approach (II)

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The core step of the knowledge biography methodology is to break-down the entire innovation in smaller consistent sub-parts/phases of KDs, that provide the specific ‘bricks’ of knowledge by which the innovation are built and form the basic units for data collection (where, when, who, how etc.)

How to do the break-up was not conceptually supported in the first “generation” of knowledge biographies (EURODITE, Manniche, Strambach, Moodysson) which considered mainly the varying topical focus of knowledge creation of individual or groups of actors involved in the innovation.

A need for an improved conceptual ground to make the approach operational.



# A knowledge biography approach (III)

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We suggest that the break-down of innovations in smaller phases of KDs (the units of data collection) should be made not by considering the involved micro-level *cognitive* processes but by paying attention to the meso-level *organizational*, managerial processes where the innovating organization intervene in and try to coordinate, direct and exploit the (micro level) KDs.

Thus, we introduce the concept of 'events' or key moments of managerial coordination.

Events are specific actions of organizations aimed at coordinating the organizational knowledge creation in innovations and incited by the evaluation of a need for a specific type of knowledge (epistemological approach). This might result from internal knowledge dynamics or by external dynamics (e.g. the introduction of new technologies or regulation schemes, changing customer demands etc.)



# Empirical illustration: Danish Crown's innovation of Bornholm pork meat

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- Event1: Recognition of demand for specialized pork product – but what specific quality? (symbolic)
- Event2: Set up of "quality discussion" group including external actors, suggesting "taste" (symbolic)
- Event3: Consultation of internal research regarding "taste factors", identifying important factors (analytical)
- Event4: Engagement of farmers and agri-consultant for trialling and testing requested production preferences and economic implications (synthetic)
- Event5: Deciding on production concept (symbolic)
- Event6: Organizing blind tasting of product prototype (synthetic)
- Event7: Marketing quality control of production concept by the customer (symbolic)
- Event8: Involving agri-consultant in elaboration of production manual for farmers (synthetic)
- Event9: Elaboration of marketing material (synthetic/symbolic)
- Event10: Adaptation of farming and processing systems (synthetic)
- Event11: Preparing/educating sales staff for product launching (synthetic/symbolic)





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