Smart Specialisation – an innovation driven strategy for economic diversification: The case of North Denmark region

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Why is Smart Specialisation important?

- Smart Specialisation (SS) is probably the single largest attempt ever of an orchestrated, supranational innovation strategy to boost economic growth through diversification, and, as such, deserves to be watched closely. It will be the basis for European Structural and Investment Fund interventions in R&I as part of the future Regional and Cohesion Policy's ambition to the European 2020 jobs and growth agenda
- Provide a framework/platform for promoting and implementing a broad based innovation policy, which is a very critical potential taking into account the failure of the linear, R&D based innovation policy of EU since Lisbon 2000

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What is Smart Specialisation?

- It is not about ’specialisation’ as we know it from earlier regional development policies (e.g. cluster policies)
- It is about diversification or *diversified* specialisation
- Regions should identify domains of existing and potential competitive advantage, where they can build capabilities and specialise in a diversified way compared to other regions
- New recombinations based on related variety (regional branching)/combinations of knowledge bases as well as on unrelated variety supported by a public innovation policy
- Aim for a ’high road strategy’, i.e. innovation based competion and not a ’low road strategy’ i.e. cost based competion
- Product differentiation creating unique products and services

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What is Smart Specialisation?

- The ’smart’ in SS refers to the way these domains of competitive advantage should be identified
- This strategy is called ’entrepreneurial discovery’
- Emphasised that this should be understood broadly, i.e. not basiscally as the efforts of a single entrepreneur
- Van der Ven (1999) talks about ’the entrepreneur’ as one type of leadership of the ’innovation journey’ to be played by a core network of interacting actors from the Regional Innovation System (firms, universities, PRIs and government institutions)
- Important to place SS within a (regional) innovation system perspective emphasizing the need for a public innovation policy/funding and exploration as well as exploitation

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Theoretical perspectives on Smart Specialisation - an overview of key concepts

- **Innovation Systems**
- **Broad based regional innovation policy:** combining R&D and experience based modes of innovation
- **Broad and comprehensive view on innovation**: many drivers of innovation (both supply and demand side (user, market demand), employee driven innovation)
- **Constructing Regional Advantage**
- **Differentiated perspective on types of innovation-relevant knowledge**
  no type of knowledge should be considered superior – all three (alone or in combination) can generate innovation and growth:
  - *analytical (science based)*
  - *synthetic (engineering based)*
  - *symbolic (art based)*

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Theoretical perspectives: Innovation systems

- A dynamic perspective on innovation and learning in the promotion of economic growth with an active role of government stimulating learning and innovation (i.e. the ’high-road’ strategy).
- Innovation as interactive learning (between T-H stakeholders (+ civil society) as well as within firms and organisations)
- Linking exploration and exploitation (e.g. Strong R&I milieus)
- Innovation at the centre of economic growth
- IS both selection environments (shaping selection processes) and sources of new variety creation (shaping creativity)

Different modes of innovation

- *'How Europe's Economies Learn. Coordinating Competing Models'* : Different *modes* of innovation (Lorenz and Lundvall, 2006)

1. *STI* (*S*cience, *T*echnology, *I*nnovation) – *analytical* knowledge/basic research (science push/supply driven) and *synthetic* knowledge/applied research (user/market/demand driven)
2. *DUI* (*D*oing, *U*sing, *I*nteracting) – *Competence* building and *organisational* innovations – *synthetic* and *symbolic* knowledge (user/market/demand driven)
3. Combining modes of innovation (STI/DUI) makes firms perform better (Berg Jensen et al., 2007)
4. Firms sourcing broadly (both R&D and experience based knowledge) are the most innovative (Laursen and Salter, 2006)

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Broad and comprehensive view on innovation

- More R&D driven innovation policies are very seldom the only answer to improving regional innovativeness and competitiveness as
- Regions' economic structure are heterogenous, where a one dimensional R&D based policy will not work. A customised regional innovation policy is needed – not the least for peripheral areas (Constructing Regional Advantage/Smart Specialisation)
- Many drivers of innovation (supply, user, demand (latent), market, social, and employee driven)
- Many types of innovation (radical vs incremental; product, process, organisational, market)
- Many regions and nations starting to have a stronger focus on this problematic. Thus, the idea of a *broad based innovation policy* get increasingly more support
- Needs both *narrow* and *broad* RIS to be implemented

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Constructing Regional Advantage (CRA)

- Creating *competitive* advantage by promoting (a Chamberlinian *monopolistic competition* based on) product differentiation resulting in *unique* products and services
- Report from DG Research, European Commission, May 2006
- CRA can be adapted as an innovation strategy in all kinds of industries, sectors, and regions
- Builds on the differentiated knowledge bases and related variety theoretical perspectives
- Perfect fit with SS promoting diversified specialisation
- Basic assumption also in the innovation systems approach
- Strenghtening of (regional) innovation systems policies

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Differentiated knowledge bases: A typology

Analytical (science based)	*Synthetic* (*engineering based*)	*Symbolic* (art based)
Developing new know-ledge about natural systems by applying scientific laws; *know why*	*Applying or combining existing knowledge in new ways; know how*	Creating meaning, desire, aesthetic qualities, affect, intangibles, symbols, images; *know who*
Scientific knowledge, models, deductive	*Problem-solving, custom production, inductive*	Creative process
Collaboration within and between research units	*Interactive learning with customers and suppliers*	Experimentation in studios and project teams
Strong codified knowledge content, highly abstract, universal	*Partially codified knowledge, strong tacit component, more context-specific*	Importance of interpretation, creativity, cultural knowledge, sign values, implies strong context specificity
Meaning relatively constant between places	*Meaning varies substantially between places*	Meaning highly variable between place, class and gender
Drug development	*Mechanical engineering*	Cultural production, design, brands

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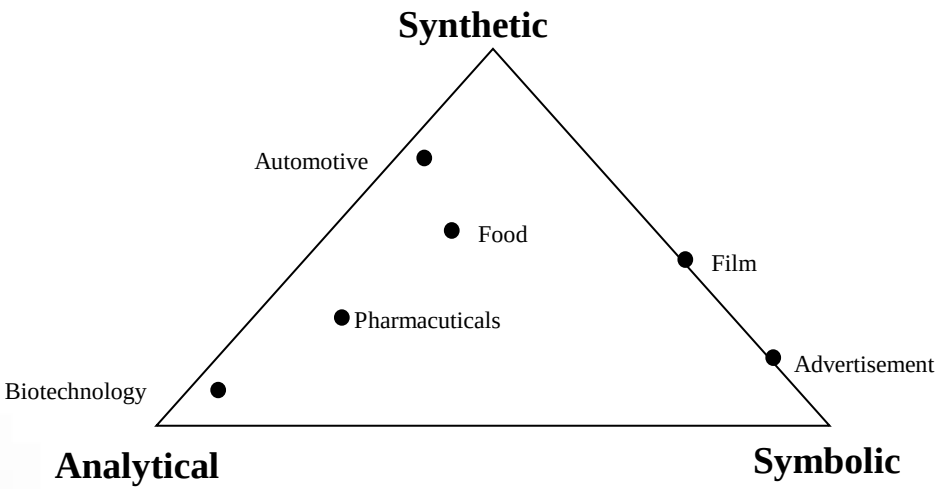
Combining knowledge bases: illustrating empirical examples



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New sources of growth: Knowledge-based capital (KBC) (OECD Review of Sweden's Innovation Policy, 2013)

- KBC comprises *intangible* assets used in production and owned by business, such as:

1. Computerised information (software and databases)
2. Innovative property (patents, *copyrights*, *trademarks*, *designs* (*Apple* – increased importance of symbolic knowledge base))
3. Economic competencies (including *brand equity, firm-specific human capital*, *networks of people and institutions*)
4. The *organisational know-how* that increases enterprise efficiency
5. Aspects of *advertising and marketing*

- Large and growing business' investments in KBC as a key source of changes in productivity and GDP

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Regional economic path development

New path creation
(unrelated diversification)

Path branching (renewal)
(related diversification)

Path extension
Innovation-based renewal & upgrading of existing industries

high

Novelty

low

- **New path creation:** Rise of entirely new sectors, radical innovation; often research driven, active policy interventions; creation of supportive organisational & institutional structures
- **Path renewal:** Diversification of existing industries into new but related ones: ***change*** based on branching processes; facilitated by related variety, combinations of KBs
- **Path extension:** incremental product & process innovation in existing industries & technological trajectories: ***continuity***; danger of path exhaustion

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National and regional context (Denmark)

- DK as well as NDR has good governance and strong institutions
- DK has a well-developed national research and innovation policy with a good connectivity between the national and regional levels
- NDR's prioritised sectors the same as the ones prioritised at the national level
- NDR has prioritised *clusters* (ICT, Food, construction industry, health and life science, maritime sector) and *networks* (tourism, experience economy, energy) and *front technologies* (energy, health and life science and transport

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National and regional context (Denmark)

- NDR belongs to the innovation leaders among European regions according to the European Regional Innovation Scoreboard
- On the other hand NDR has a relative low educational and competence level and a lack of investment in R&D in the traditional SMEs giving them a low absorptive capacity
- Problems of attracting and retaining highly qualified people
- Industrial structure has a dual character:

1. On the one hand the traditionally dominating industries mostly SMEs, depending on an experience based mode of innovation (food, construction, maritime and tourism)
2. On the other hand the research and knowledge intensive, mostly emergent, sectors representing front technologies

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Innovation policies for new path development: Upgrading traditional industries - recommendations

Path renewal

- Support firms and industries to search for, connect to and combine different knowledge bases/innovation modes
- Strengthening/creating organisational and institutional support structures for knowledge base combinations

Example: traditional industries (synthetic knowledge base)

- Increase firms' research-based competence; strengthening their absorptive capacity for analytical knowledge (e.g. functional food) and connect them to providers of analytical knowledge (local, regional, global) – *food, construction, maritime*
- Move into high value-added niches through combinations of synthetic and symbolic knowledge bases - *food*
- Use of symbolic knowledge to obtain product innovation (e.g. branding and design (symbolic knowledge) in the food and beverage sector – *food, tourism*

Innovation policies for new path development

New path creation

- Promoting emerging industries by building on newly created, R&D based knowledge (analytical knowledge base)
- Investment in exploration (building up and strengthening ROs, investment in front technologies) and exploitation capacity (support for new firm formation, academic spin-offs, commercialisation of university research, science parks, venture capital, etc.)
- Creating new organisational and institutional support structures
- Applying a R&D based strategy is a costly development and differentiating strategy with a high failure rate and long term perspectives for a positive outcome (long time from exploration to exploitation)

Policy recommendations

- Research and knowledge intensive sectors:
- Based on research strenghts at Aalborg univeristy in front technologies within energy (energy efficiency), health and life sciences (medical technology),transport (intelligent transport) and ICT (embedded software)
- Applying a R&D based strategy is a costly development and differentiating strategy with a high failure rate and long term perspectives for a postive outcome
- However, giving the strong research base, strong national and potential EU funding, NDR should also pursue this strategy
- Research strenghts at AAU a combination of analytical and synthetic knowledge – closer to exploitation – exploitation capacity lacking

The role of the public sector in a SS strategy

- Use public procurement for innovation as a central instrument
- Health and welfare are confronted with huge societal challenges due to aging of society which requires these sectors to operate in a smarter way
- Combining user-driven, open and social innovation approaches
- NDR is responsible for the health sector, and represents a large and critical customer (together with Aalborg municipality)
- Building a new, large university hospital close to Aalborg university
- Can mobilise most of the ’front technologies’ in the region (energy efficiency, health and life science, logistics and ICT)

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Advice/recommendations

Governance structure:

- Growth Forum/NDR should establish an agency with the operational responsibility of implementing a policy of PPI
- Growth Forum should decentralise the operational responsibility for supporting the growth of research based, emerging sectors to operational organisations more direclty involved in innovation and industrial development
- Consolidated cluster organisations representing front technologies with a triple helix constellation of stakeholders
- Easier to secure that implentation is according to strategic goals set by the Growth Forum

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Main recommendations

RIS 3 – Expert Assessment (Bjørn Asheim):

1. Build on national strengths positions
2. Move towards high value-added niches
3. Increase educational and competence level in the private sector
4. Mobilize additional funding for knowledge intensive R&D-driven sectors
5. Make use off Public Procurement for Innovation (PPI)
6. Focus on the attractiveness of North Denmark
7. Establish clear action lines in the strategy

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Industrial areas with growth potential for North Denmark
- The 8 national ”Growth areas”

MINISTRY OF BUSINESS AND GROWTH DENMARK

- Maritime Industry
- Energy & Climate tech.
- ICT & Digitalization
- Tourism & Experience
- Creative Businesses
- Food
- Health & welfare solutions
- Water, Bio & Environment solutions

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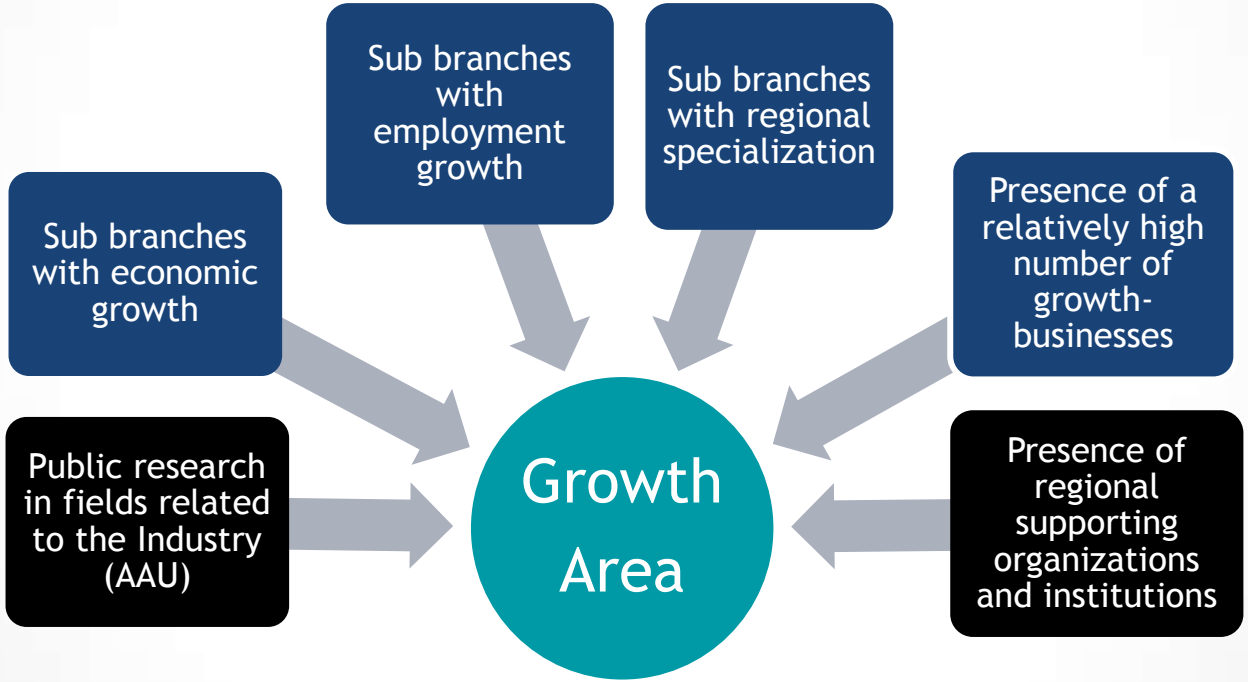
The 8 national ”Growth areas”
– Mapping of growth potential



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The 8 national "Growth areas"
– Growth potentials for North Denmark

North Danish growth potentials

Maritime Industry
- Logistics, green equipment and service.

Foods
- High quality non/semi processed foods & agro technology

Tourism
- Development of the regional tourism product towards high value niches

Water, Bio & Environment
- Possibilities for development in the recycling industry

Energy & Climate
- Oil rigs, Windmills, Boilers , Pumps and Biogas Plants.

Creative businesses & Design
- High specialization in production of fur

Information & Communication Technology
- Potentials within ICT services, e.g. software and ICT -consultantsy.

Health & Welfare
- Possibilities for developing local business access to develop and test innovative solutions in collaboration with the public

Construction & Housing
- Many specialized subcontractors for the construction sector

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Thanks for the attention

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