System level	Type of system	Entrepreneurial regional innovation system (ERIS)	Institutional regional innovation system (IRIS)
	Image of the market	Ambiguous, potential collaborative space	Uncertain, risky competitive space
	Type of innovation process	Action-oriented: based on experimental learning	Planning-oriented: based on the need for overview, control and risk minimizing
	Strategies	Emergent	Planned
	Time perspective	Emergence; fuzzy vision combined with step-by-step action	Present and future; more clear vision combined with long-term planning
	Organizational structure	Organic (loosely coupled); to a large extent based on trust	Mechanistic; to a large extent based on contractual ties
	Critical resources	Entrepreneurial skills Venture capital	Management skills Institutional capital
	Decision logic	Effectuation: Taking action based on available/ accessible resources	Causation: Planning for and controlling the future
	Cooperation	Ad hoc-based, intermittent and often termed short-termed	Planned and long-termed
Actor level	Critical performers	Actors: Individuals who form teams of complementary competences	Agents: Representatives of different sectors of society

Figure 2. Contrasting entrepreneurial and institutional regional innovation systems

(Cooke & leyesdorf, 2006; Ylinenpää, 2009)

Ecosystem

- A metaphor to describe the complex network of interactions and interdependencies among various components.
- Consists of various organisations, institutions, individuals, and resources that interact with each other to promote and support innovation.

Universities

Research institutes

Start-ups

Established companies

Investors

Government agencies

Other organizations

A highlight on the course website : MIT Sloan Executive Education (2018) Innovation Ecosystems - Leveraging their Power for Organizational Success and Strategic Change (58:17)

Innovation ecosystem

‘Network of interconnected organizations, **connected to a focal firm or a platform**, that incorporates both production and use side participants and created as appropriates new value through innovation.’

(Autio & Thomas 2014)

Innovation ecosystem

- Emphasizes more market mechanisms than institutionally oriented innovation system literature
- Initiated in business studies
  - IRIS from economics, regional studies, economic geography, etc. but entering ERIS studies
- Organic metaphors replace mechanical ones

- Ecosystem members share the fate of the entire system (Moore, 1993)
- Access to global innovation ecosystems highlighted

Rinkinen (2016): “ecosystems are first and foremost global.

The role of a region [originally] is not visible in the literature concerning ecosystems.

The national level perspective is the main way in which ecosystem discussion is connected to the geographical context.

It is generally difficult to define the ecosystem boundaries, whether they are geographical or not.”

Local and regional development scholars and policy makers have woken up

Photo by Pascal Debrunner on Unsplash

Vinnväxt Programme, Sweden

- Supports regional growth through dynamic innovation systems
- Takes the form of a competition for regions
  - The winning regions will receive funding of up to SEK 10 million per year for a period of ten years.
- The aim is to promote sustainable growth by developing internationally competitive research and innovation environments in specific growth fields

VISUAL SWEDEN

Europe's most attractive innovation environment for visualization and image analysis: Norrköping-Linköping.

VINNOVA

Vinnväxt winner 2016

SCIENCE PARK MJÄRDEVI

NORRKÖPING SCIENCE PARK

lead

LIU INNOVATION

almi

Vreta Kluster

SAAB vti LFV SIEMENS TOYOTA MATERIAL HANDLING Polisen Nationellt forensiskt centrum SGI SMHI Linköping Where ideas come to life NORRKÖPING Region Östergötland

Secure IoT

SECTRA drakryggen Interspectral image CONTEXTVISION glana STYLAERO RAYSPACE SICK IVP HOYLU dataton spotscale WoodEye BioOptico voysys FINDOUT CINED usify. Senion Agricam AB xmreality AMRA Optiplan SkyMaker CYBERCOM GROUP Wheels Bridge Visage Technologies laidback infviz idea hunt XperDI Termisk Systemteknik melerit medical Etteplan IMAFOR gaia VISIARC materialeves Significant Bit enterspace berotec Teknomedia DISENT AB ENVISTA MASSVIS UNIVRSES Augminded AB OLJONS MEDIA FISHY MINDS COMBITECH

Sustainable business models

Effective logistics

liu FOI RI. SE

Advanced materials

Example: Virtual autopsy reveals ancient Egyptian murder (1:50)

https://www.youtube.com/watch?v=BOE5rjdULTc

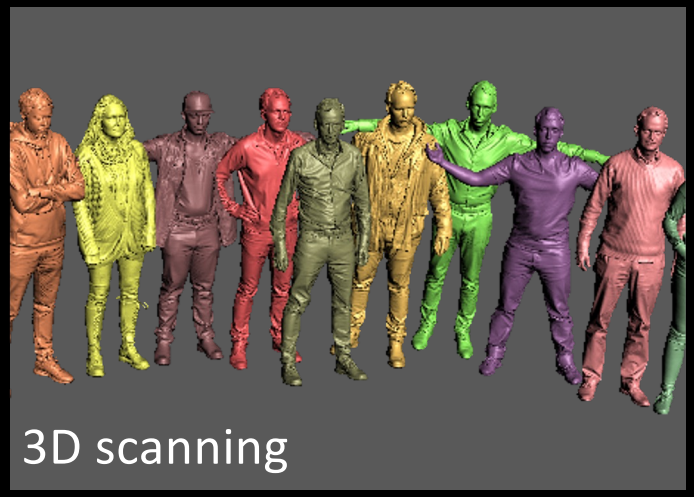
https://www.youtube.com/watch?v=ufirpyUGPLk

Stimulation activities


Matchmaking


EPO Seminars


Breakfast meetings

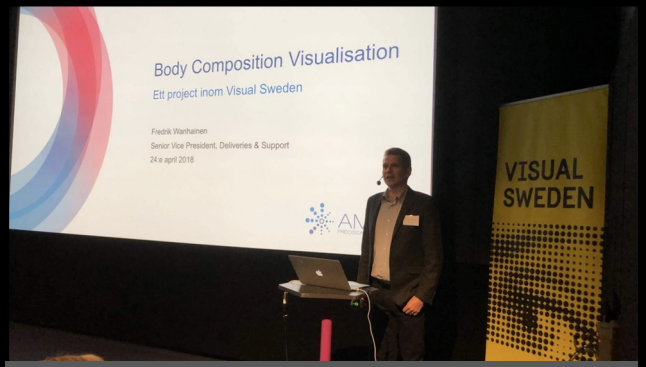

3D scanning

Challenge driven


Demand-driven

Visibility

Newsletter – every 2nd week



Visual Sweden Day - yearly

Permanent exhibition

Swedish television - Face recognition

Most innovative of Almedalen

Visual Sweden venture Award

Complementary if you like to learn more

OPEN SPACE - SC19 Invited Talks: Anders Ynnerman, Linköping University, Sweden (45:49)

https://www.youtube.com/watch?v=CN2fzPlfznU

Tampere?

- Business Tampere - https://businesstampere.com/
- Business Tampere Magazine - https://businesstampere.com/news/
- Pirkanmaan talous - https://pirkanmaantalous.fi

Path development, proximity and innovation

Criticism: many of the theories and models related to economic development of regions and innovation systems are too static

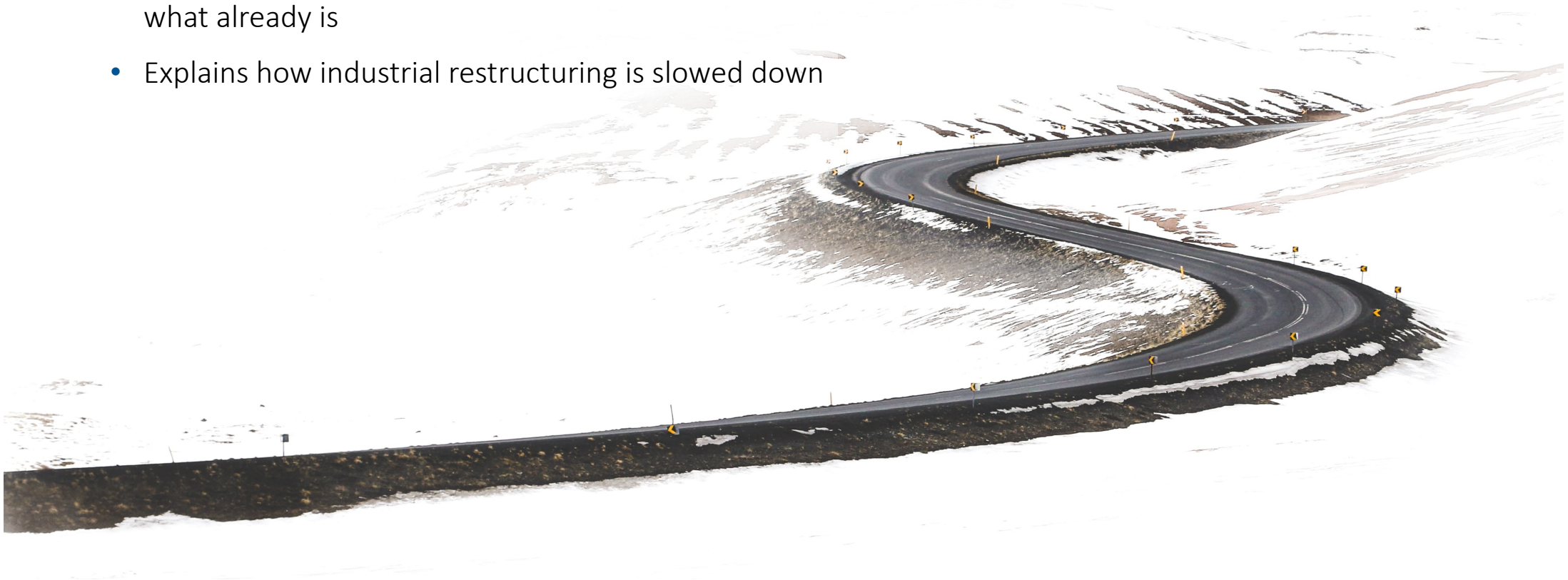
Path development

Path dependence and path creation

- Path dependence and path creation (also referred to as new path development) are key concepts in regional development studies (Hassink, Isaksen & Trippl, 2019)
- Path creation or new path development is about 'the emergence and growth of new industries and economic activities in regions'(MacKinnon, Dawley, Pike, & Cumbers, 2018a)

Path dependency

- Explains a current state of affairs from its history
- Explains how existing industrial structures preserve what already is
- Explains how industrial restructuring is slowed down



Processes generating path dependency

David's network externality

- Technical interrelatedness
  - the reinforcing effects of complementarity and compatibility among the different components of a technology and its use
- Economies of scale
  - the benefits associated with the increasing use of a technology—such as a decline in user costs—as the technology gains in acceptance relative to other systems
- The quasi-irreversibility of investments
  - the difficulties of switching technology-specific capital and human skills to alternative uses

Arthur's increasing returns effects

- Large initial fixed setup costs
- Dynamic learning effects
  - learning by doing or using and learning by interaction tend to entail positive feedbacks
- Coordination effects
  - confer advantages to going along with other economic agents taking similar actions
- Self-reinforcing expectations
  - when the increased prevalence of a product, technology, process, or practice enhances beliefs of further prevalence

(Martin 2010)

Table 1. The key dimensions of particular evolutionary pathways of a decline.

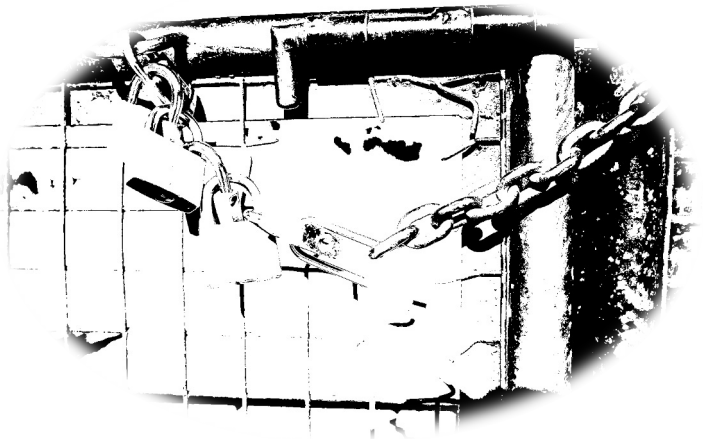
	Firm-level		Key dimensions			Region-level: Modification of the regional asset base		Empirical illustrations	
Path	Strategies	Main drivers	Connectedness	Capital accumulation	Resilience	Main alterations	Future potential	Example	Reference
Down-grading	Removal of higher value-added functions	FDIs driven by low-cost strategies / intensive competitive pressure	Internal: decrease; external: increase	declining	declining	Loss of key assets	Risk of being trapped in lower-quality segments	• South East of Bulgaria (apparel, 1990s) • Non-metropolitan regions in Philippines (voice-based services, 2000–2013) • Daegu (textile, 1980–2005)	• Pickles, Smith, Bučěk, Roukova, and Begg (2006) • Kleibert (2016) • Hassink (2010)
Contraction	Reduction of product diversity / re-specialization	Weak competitiveness in the global economy	Internal: decrease; external: increase	declining	varying	Risk of over-specialized assets	Diminishing opportunities for diversification	• Pittsburg (steel, 1980–2005) • South Birmingham (automotive, 1970–1980s) • Teeside (steel & chemicals, 1960–1980s) • Luxembourg (financial services, 1990–2014)	• Treado (2010) • Smith (1989) • Beynon et al. (1989) • Dörry, (2015)
De-localisation	Relocation to more favourable locations	Better cost-capability ratio, more suitable frameworks or availability of resources at other locations	Ultimately declining (internally & externally)	Dis-investment	sharply declining	Broad destruction and de-locking of assets	Severe effects on long-term development potentials	• La Laguna (textile, 2000–2010) • S. Korea (retail, 1999–2015) • S. Australia & Victoria (automotive, 2000–2017)	• Bair & Werner (2011b) • Coe et al. (2017) • Beer (2018)

Source: Own compilation.

Lock-ins

- Structural lock-in
- Cognitive lock-in
- Political lock-in

(Grapher, 1993)



Institutions carry history and lock-ins

Photo by Crispin Jones on Unsplash, modified by MS

Close intra-regional interdependence may turn against innovation

- Shared worldview and groupthink
- Focus on improving the old and not on developing new trajectories
- Adapation is difficult

- Perfect adaptation to a specific local environment and internal coherence
  - Stable inter-organisational linkages (Functional)
  - Personal relations and related knowledge (Cognitive)
  - Tightly knit politico-administrative system (Political)

(Grapher, 1993)

Why do well-doing cities/regions turn into stagnant regions?

- Stable trust-based linkages between regional core firms and other actors
- Reduce transaction costs but do not boost innovation
- Long-term R&D becomes an end in itself

- Source of ideas too narrow
- Quality of marketing and distribution too local
- Localized personal connections rather than constantly evolving open networks

”Old Industrial Regions can be regarded as the Industrial Districts of the past: initial strengths - industrial atmosphere, specialized infrastructure, close inter-firm linkages, strong support by regional institutions - turned into stubborn obstacles to innovation”

(Grabher 1993)

The closure of the Australian car manufacturing industry (Beer 2018)

Was decline inevitable, and was it the product of a strong currency buoyed by a mining boom?

What	Announced (Closure)	Outcome
Toyota	2014 (2017)	• 30 000 jobs in South Australia • 100 000 jobs in Victoria
General Motors Holden (GMH)	2013 (2017)	
Ford Australia	(2013)	
Mitsubishi	(2008)	
Nissan	(1992)	
Chrysler	(1981)	
Leyland	(1971)	

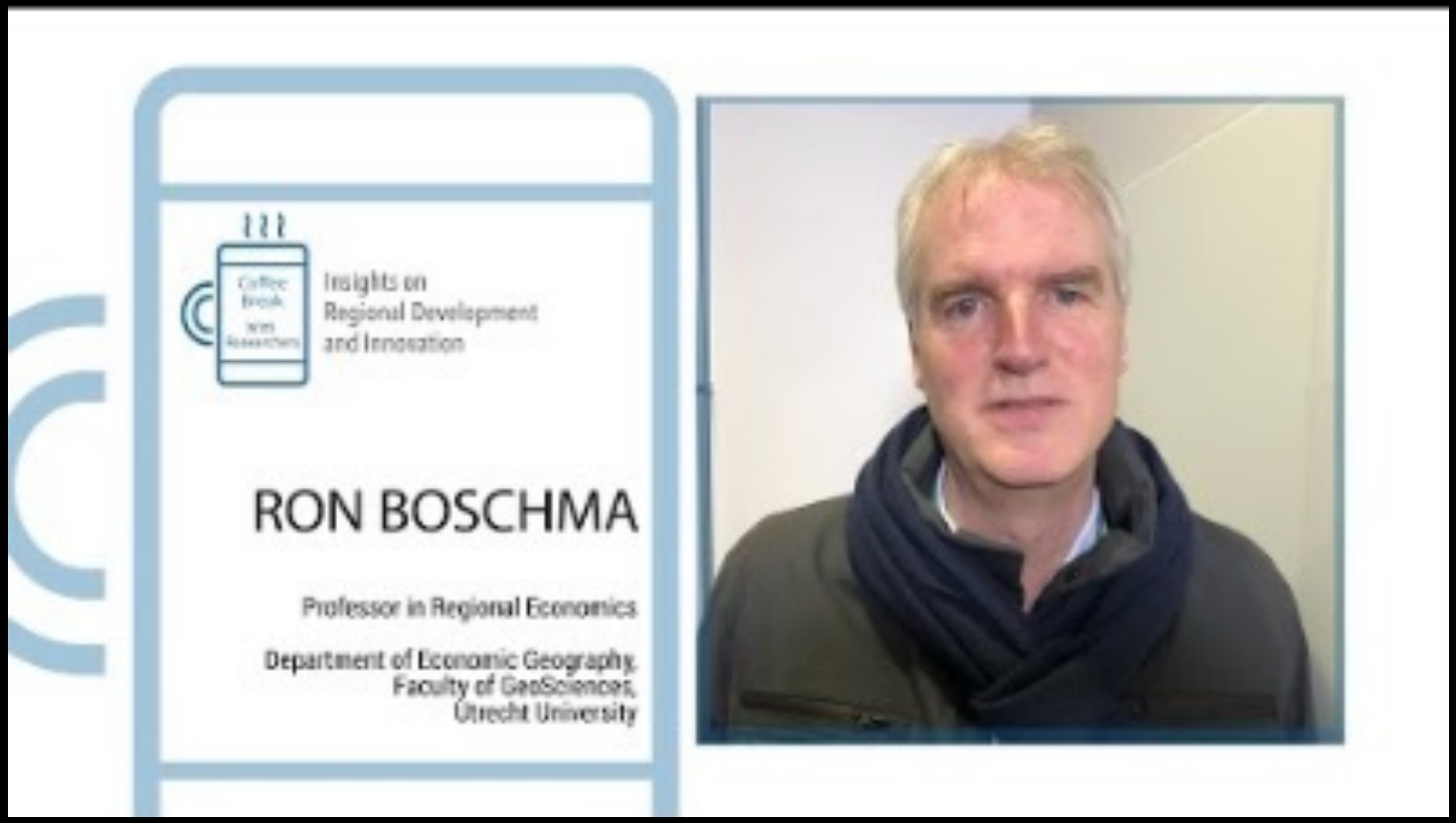
- All sectors are potentially vulnerable in a globalised economy
- Relative labour costs alone are not the sole determinant of an industry's capacity to survive

Why

- A peripheral position in global production networks -> limited knowledge base and innovation capacity
- No supportive industrial ecology around the major producers - limited knowledge base and innovation capacity
- The small scale of local production - no cluster effect
- High cost structures relative to competitor plants
- A strong currency
- The shifting priorities of parent corporations

(Beer 2018)

Ron Boschma: Proximity and Innovation: A Critical Assessment



https://youtu.be/_u48rBMltN8

Ron Boschma

Table 1. *Five forms of proximity: some features*

	Key dimension	Too little proximity	Too much proximity	Possible solutions
1. Cognitive	Knowledge gap	Misunderstanding	Lack of sources of novelty	Common knowledge base with diverse but complementary capabilities
2. Organizational	Control	Opportunism	Bureaucracy	Loosely coupled system
3. Social	Trust (based on social relations)	Opportunism	No economic rationale	Mixture of embedded and market relations
4. Institutional	Trust (based on common institutions)	Opportunism	Lock-in and inertia	Institutional checks and balances
5. Geographical	Distance	No spatial externalities	Lack of geographical openness	Mix of local 'buzz' and extra-local linkages

Table 1. *Types and mechanisms of regional industrial path development.*

Forms of path development	Mechanisms
Path extension	Continuation of an existing industrial path based on incremental innovation in existing industries along well-established technological trajectories
Path upgrading	
I—Climbing GPN	Major change of a regional industrial path related to enhancement of position within global production networks; moving up the value chain based on upgrading of skills and production capabilities
II—Renewal	Major change of an industrial path into a new direction based on new technologies or organisational innovations, or new business models
III—Niche development	Development of niches through the integration of symbolic knowledge
Path importation	Setting up of an established industry that is new to the region (for example, through non-local firms) and unrelated with existing industries in the region.
Path branching	Diversification into a new related industry for the region building on competencies and knowledge of existing industries
Path diversification	Diversification into a new industry based on unrelated knowledge combinations
Path creation	Emergence and growth of entirely new industries based on radically new technologies and scientific discoveries or as an outcome of search processes for new business models, user-driven innovation and social innovation

Source: own elaboration, inspired by (Isaksen et al. 2018)

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Machinery in Tampere

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Kimono cluster in Kyoto

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Data centres

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Source: own elaboration, inspired by (Isaksen et al. 2018)

From pulp and paper to biofuels

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From cruisers to hotels or amusements parks

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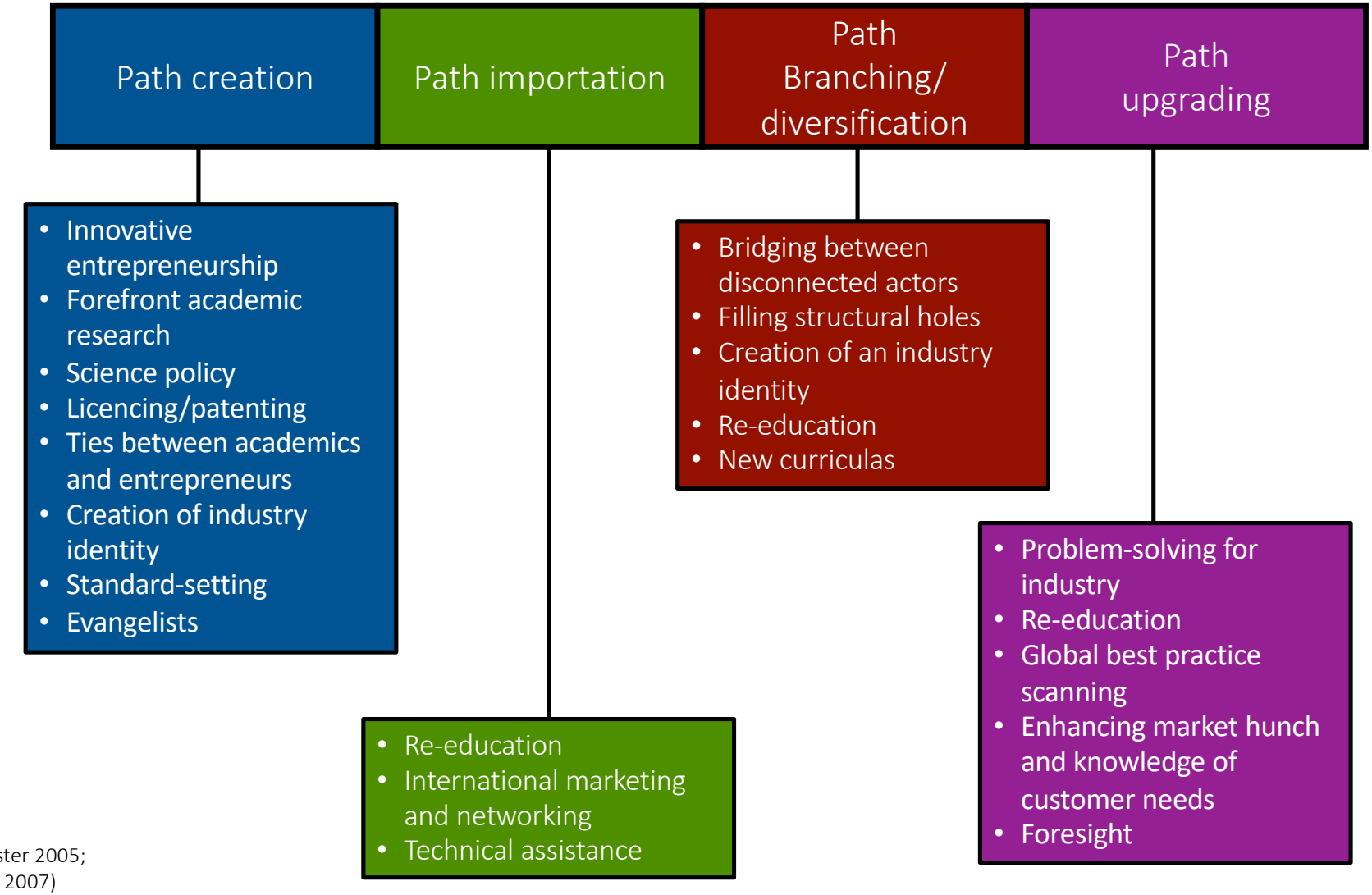
Personal computers

Key mechanisms in path development



(Modified from Lester 2005; Lester & Sotarauta 2007)

Geography of innovation - contributions

Photo by Shaun Meintjes on Unsplash

Where next?

Old way (After the II WW)	New way (1980/90 ->)	Next way??? (2020 ->)
Industry standards	Open systems	Restricted systems inside blocs
Culture of secrecy, loyalty, individual action	Culture of interaction, labour mobility, experimentations	Culture of secrecy and loyalty between blocs but interaction inside them
Self-sufficiency under one roof, often in a large firm	Decentralized system, specialised core competencies, division of labour	Centralisation creeps back to secure national interests – cities and regions comply
Firm and state based	Globally, nationally, regionally network-based	Blocs and nationally based
National interests dominated in an opening intl. economy	Global economy and local/regional hubs (cities)	Blocs and nation states dominate

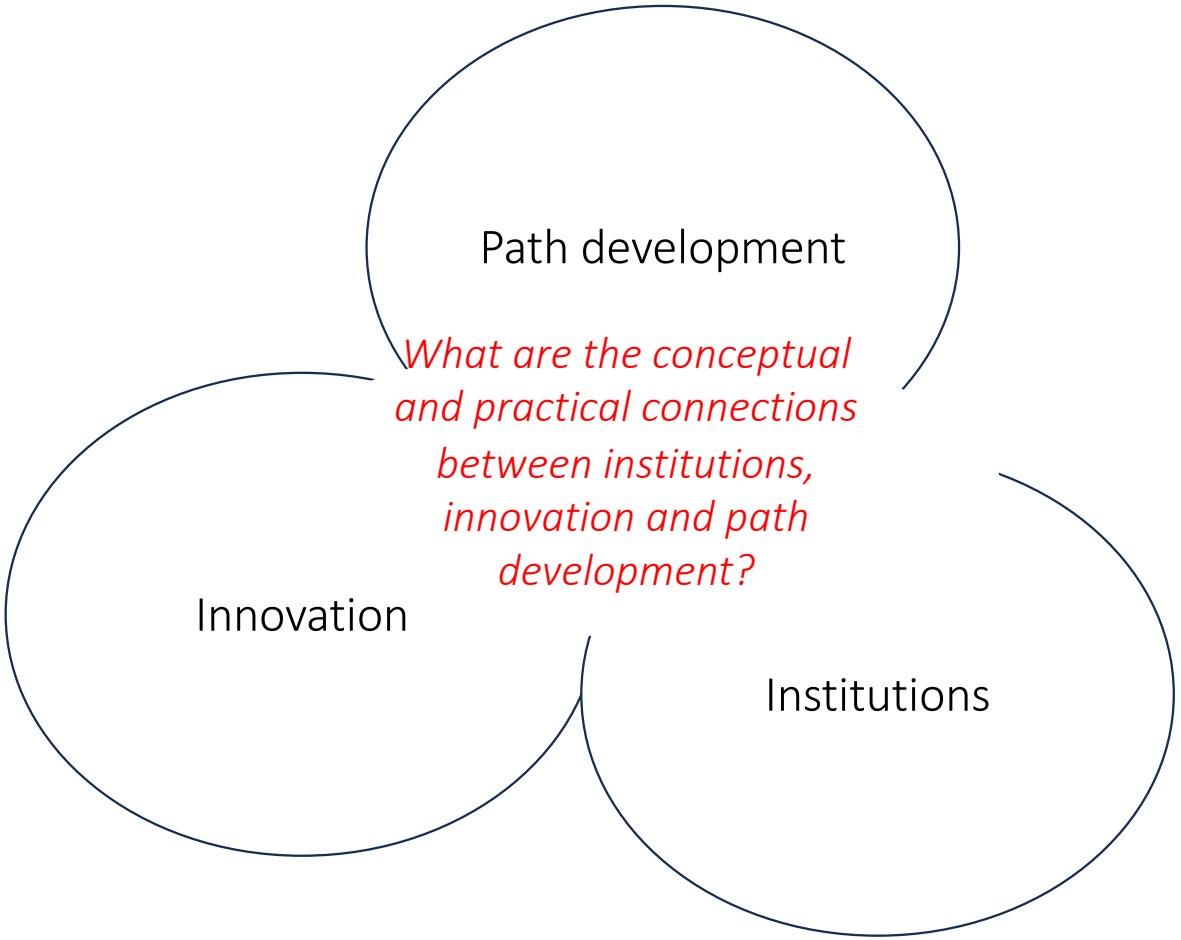
- Uneven geography of knowledge and innovation clearly revealed
- Regional typologies
  - Key actors and governance (Cooke 1998; Asheim and Isaksen 2002)
  - Strengths in radical versus incremental innovations (Cooke 2004)
  - System failures (Isaksen 2001; Tödtling and Trippl 2005)

- Application to a variety of contexts
  (Radosevic 2002; Chaminade and Vang 2008; Blazek and Zizalova 2010; Lundquist and Trippl 2013)
  - How to understand incomplete or emergent RIS?
  - How and why RIS emerge and strengthen over time?
  - How to compare RIS across fundamentally different institutional and economic contexts?

Generic lessons

- The 'right' institutional, cultural and governance conditions stimulate innovation in localities
  - What are the right conditions – that's the question
- Local government and local networks may influence by being proactive in stimulating an innovative environment.
  - Call for place leadership (-> hal.kajo.316)

- Local innovation stimulates local renewal
  - Regions need to **specialize** to generate clusters, milieux, systems or learning capacities
  - **Diversity** is the soil where specializations grow


Path development
What are the conceptual and practical connections between institutions, innovation and path development?
Innovation
Institutions

Thank you – enjoy forthcoming spring!

But not yet

Photo by Sergio Ibannez on Unsplash