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The geography of knowledge dynamics and customized innovation policies

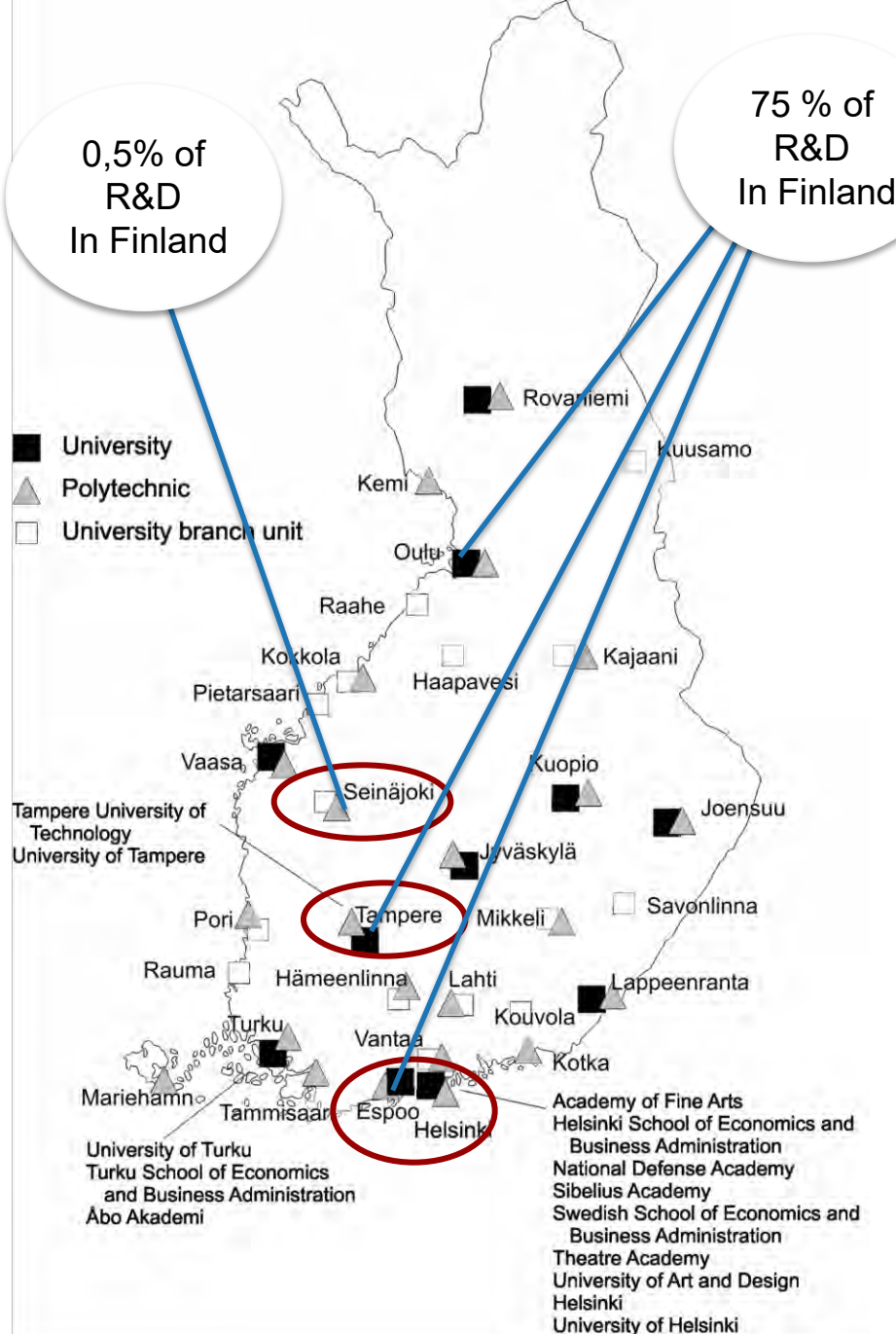
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The questions

- How do the knowledge sources differ between different types of regional innovation systems and knowledge bases?
- Are the investigated innovation policies context sensitive and customized to the prevailing innovation problems?
- To which extent do innovation policies focus on overcoming specific bottlenecks of the respective regional innovation system and address system failures hampering innovation?

Cases



Helsinki

- Metropolitan region: appr. 1.000.000
- Complex and versatile metropolitan region
- Digital content and service business

Tampere

- Tampere city-region: appr. 345.000
- Traditional industrial town that has reinvented itself as a knowledge city
- Mobile heavy machinery in Tampere region

Seinäjoki

- Town-region: appr. 99.000
- Service centre of the most rural region in Finland
- Agrotechnology



	DigiBusiness (HMA)	Mobile heavy machinery (Tampere Region)	Agrotechnology (South Ostrobothnia)
Nature of the concentration	<ul style="list-style-type: none">- Music, text, images loaded or distributed through various digital channels- Heterogeneous and fast developing with mainly small firms	<ul style="list-style-type: none">- Machine building (e.g. drilling machines, container handling machines, forestry machines)- Mature with several global market leaders	<ul style="list-style-type: none">- Manufacturers and developers of machinery, and control and information systems for agriculture, forestry and food industry- Mature with national focus





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- 95 structured interviews with firms (Tampere 26, SO 18, Helsinki 51)
- 40 thematic interviews with policy officers responsible for local and regional innovation policies
- 53 interviews with national policy-makers (partly for a different project, re-analysed for this one)



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	South Ostrobothnia (n=18)		Tampere region (n=26)		Helsinki metropolitan area (n=51)	
	<i>Employees 2005</i>	<i>Employees 2008</i>	<i>Employees 2005</i>	<i>Employees 2008</i>	<i>Employees 2005</i>	<i>Employees 2008</i>
Mean	49.9	60.2	179.9	225.7	106.8	112.3
Median	41.0	65.0	77.5	107.5	12.5	18.0
Standard dev.	44.6	51.5	283.1	276.7	504.3	464.1
Minimum	1	1	1	8	1	1
Maximum	160	180	1200	900	3500	3300



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Conceptual frame



Customised innovation policy



- No 'one size fit for all' formula for promoting innovativeness - not even among the Nordic countries (Asheim et al 2011)
- Innovation policies and practices do not vary only between countries but also within them (Tödling & Trippel 2005)
- Innovation policies and knowledge bases - analytical, synthetic, symbolic (Asheim et al. 2007)
- Unique advantages have to be actively constructed and innovation policies customised



- **Innovation policy** is actions by public organisations that influence innovation processes (Edquist 2008)
 - ✓ **Focus** = the center of interest or activity
 - ✓ **Focus on** = pay particular attention to something
 - ✓ To **customize** is to modify something to suit a particular entity or task
 - ✓ To **fine-tune** is to make small adjustments to (something) in order to achieve the best or a desired performance

BUT, to suit who and/or what; a) region, cluster or a firm OR
b) dominant theory, globally circulating policy wisdom,
recognized needs, latest fashion, power-holders' interests or
what?



Localized and/or regionalized innovation policies may have some advantages in solving specific issues.

- National innovation policies have a regional impact - intended or not
- Regional differences...
 - ✓ in the quantity and quality of innovation activity
 - ✓ in the performance of the entire regional innovation system
 - ✓ in the institutions/practices framing the action and choices made in the region
- Differentiated strategies and instruments are needed both to serve the specific regions and to achieve national-level goals more effectively.

(Fritsch & Stephan, 2005)



- Regions are usually poorly, if at all, defined in the Finnish national innovation policies.
- Regional innovation policy is, more or less, seen as an extension of national policies (Suorsa 2007)
- Due to strong local government national and local policies have coevolved for some time (Sotarauta & Kautonen 2007)



- Peripheral regions (organizational thinness)
 - **South Ostrobohtnia**
- Old industrial areas (lock-in)
 - **Tampere region**
- Metropolitan regions (fragmentation)
 - **Helsinki MA**

(Tödtling & Trippel, 2005)



Analytical	Synthetic	Symbolic
Developing new knowledge about natural systems by applying scientific laws; <i>know why</i>	Applying or combining existing knowledge in new ways; <i>know how</i>	Creating meaning, desire, aesthetic qualities, affect, intangibles, symbols, images; <i>know who</i>
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, 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



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Innovation policy in Finland

Main innovation funding schemes in Finland

Strategic centres for science, technology and innovation
300 million euros yearly

Forest cluster - **ICT and services - metal products and mechanical engineering** - energy and the environment - built environment innovations - health and well-being

Tekes Programmes
500 million euros yearly

Academy of
Finland's
Programmes

Centres of expertise
**INKA -
programme**
20 million euros yearly

Strategic research

Industrial research

Experimental
development

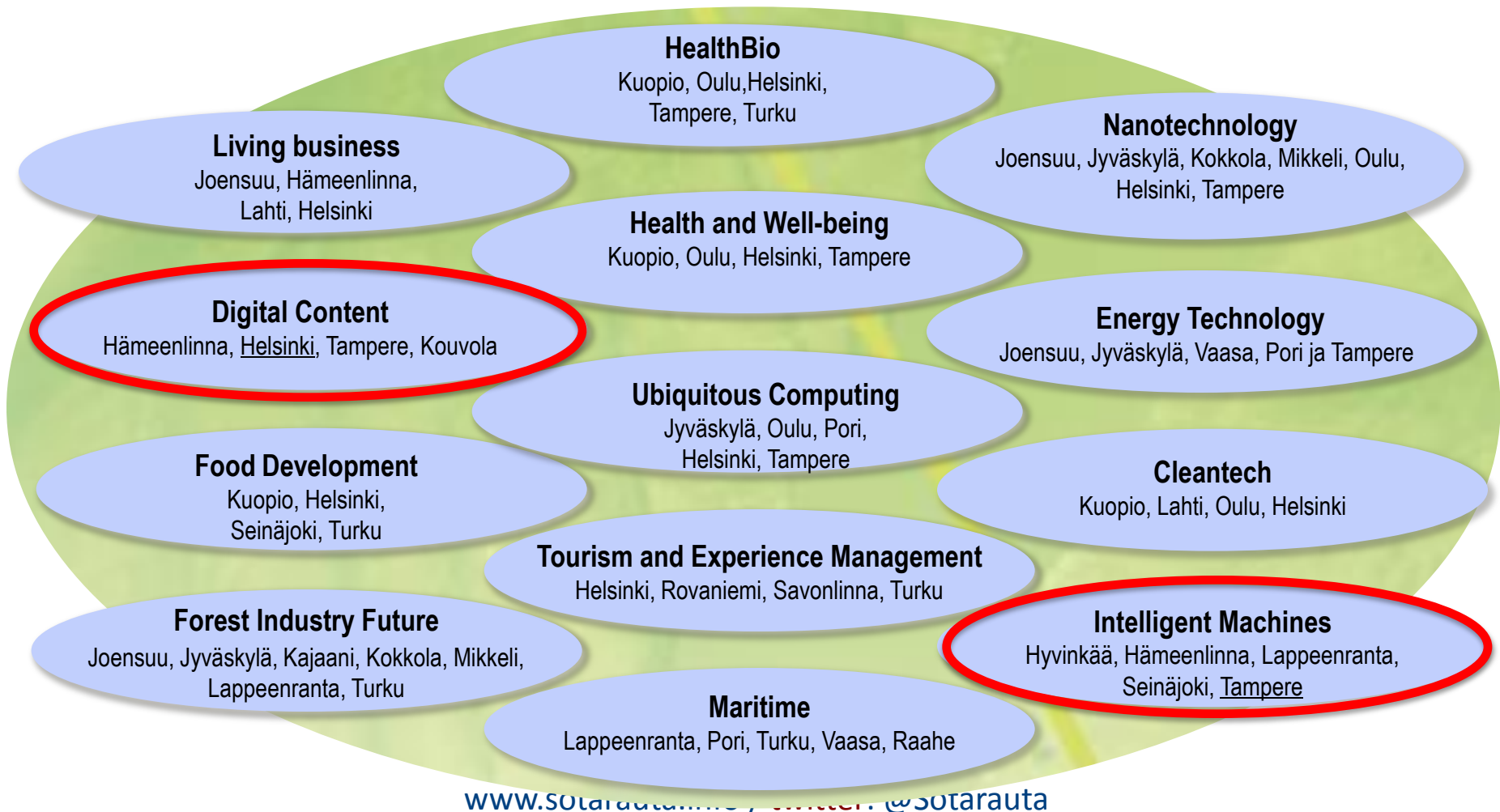


The Finnish Strategic Centres for Science, Technology and Innovation (SHOK)

- Non-profit limited-companies with research programmes
- Concentrated funding scheme
 - ✓ In the Finnish Metals and Engineering Competence Cluster (Fimecc Ltd.) the size of research programmes vary between MEUR 20 and MEUR 51
- Dialogue between companies and research institutions
- Established and run by leading firms, universities and other stakeholders
 - ✓ Large company dominated
 - ✓ Process innovation, incremental
 - ✓ Maintaining old industrial structure
 - ✓ Very focused -> not always suitable for regional efforts

Competence Clusters and the Regional Centres of Expertise

Efforts to create focused and co-ordinated 'multi-scalar triple helix policies'





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Empirical observations

Geography of knowledge



Spatial levels in recruitment

	South Ostrobothnia (n=17)			Tampere region (n=26)			Helsinki metropolitan area (n=51)		
	<i>Regional</i>	<i>National</i>	<i>Intl.</i>	<i>Regional</i>	<i>National</i>	<i>Intl.</i>	<i>Regional</i>	<i>National</i>	<i>Intl.</i>
Universities and polytechnics	3.8	2.2	1.3	4.2	2.7	1.5	3.8	2.4	2.1
Technical colleges	2.5	1.1	2.6	3.2	1.3	2.3	3.0	1.5	2.9
Firms of the same sector	1.3	2.6	2.6	1.6	3.2	2.0	2.0	4.0	2.3
Firms of different sectors	3.6	3.0	1.2	3.5	2.8	1.3	3.0	2.9	1.7

Sources of market information

South Ostrobothnia	Customers	Suppliers	Other firms	Competitors	Univ.	Res.org./polyt.	Other sources	Total
Local	12	11	38	8	17	0	27	18
Regional	8	0	6	0	0	0	0	4
National	69	56	31	17	83	100	64	54
International	1	33	25	75	0	0	9	24
Total (%)	100	100	100	100	100	100	100	100
Linkages	n=26 (31.7%)	n=9 (11.0%)	n=16 (19.5%)	n=12 (14.6%)	n=6 (7.3 %)	n=2 (2.4%)	n=11 (13.4%)	n=82 (100%)

Tampere region								
Local	31	20	15	17	75	40	21	27
Regional	3	10	0	0	0	0	3	3
National	40	40	40	33	25	60	52	42
International	26	30	45	50	0	0	24	28
Total (%)	100	100	100	100	100	100	100	100
Linkages	n=90 (52.9%)	n=10 (5.9%)	n=20 (11.8%)	n=12 (7.1%)	n=4 (2.3%)	n=5 (2.9%)	n=29 (17.1%)	n=170 (100 %)

Helsinki metro								
Local	68	80	49	56	83	65	94	67
Regional	3	0	4	0	0	0	0	2
National	3	20	4	0	17	6	3	9
International	6	0	43	44	0	29	3	22
Total (%)	100	100	100	100	100	100	100	100
Linkages	n=113 (44.5%)	n=15 (5.9%)	n=51 (20.1%)	n=9 (3.5%)	n=6 (2.4%)	n=31 (12.2%)	n=29 (11.4%)	n=254 (100%)

Sources of technology information

South Ostrobothnia	Customers	Suppliers	Other firms	Competitors	Univ.	Res.org./polyt.	Other sources	Total
Local	0	19	36	0	13	18	33	20
Regional	0	0	14	0	13	0	0	5
National	83	58	50	0	74	73	67	64
International	17	23	0	0	0	9	0	11
Total (%)	100	100	100	100	100	100	100	100
Linkages, total	6 (7.9%)	26 (34.2%)	14 (18.4%)	0 (0%)	16 (21.1%)	11 (14.5%)	3 (3.9%)	76 (100%)

Tampere region								
Local	30	12	15	0	44	20	42	30
Regional	6	0	8	33	7	0	8	6
National	44	12	46	67	29	67	31	38
International	20	76	31	0	10	13	19	26
Total (%)	100	100	100	100	100	100	100	100
Linkages, total	81 (39.7%)	25 (12.2%)	13 (6.4%)	3 (1.5%)	41 (20.1%)	15 (7.4%)	26 (12.7%)	204 (100%)

Helsinki metro								
Local	44	56	50	17	67	50	89	52
Regional		0		17	0	0	0	4
National	14	0	10	0	22	30	0	11
International	35	44	35	66	11	20	11	33
Total (%)	100	100	100	100	100	100	100	100
Linkages, total	36 (33.9%)	16 (15.1%)	20 (18.9%)	6 (5.7%)	9 (8.5%)	10 (9.4%)	9 (8.5%)	106 (100%)



	Market knowledge			Technology knowledge		
	<i>South Ostrobothnia (n=20)</i>	<i>Tampere region (n=46)</i>	<i>Helsinki metro (n=49)</i>	<i>South Ostrobothnia (n=7)</i>	<i>Tampere region (n=42)</i>	<i>Helsinki metro (n=20)</i>
Nordic countries	35	15	8	29	24	10
Rest of Europe	45	48	33	57	62	45
USA	10	9	55	14	12	45
Asia	5	0	2	0	0	0
Others	5	28	2	0	2	0
Total	100	100	100	100	100	100



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Empirical observations

Customized innovation policies

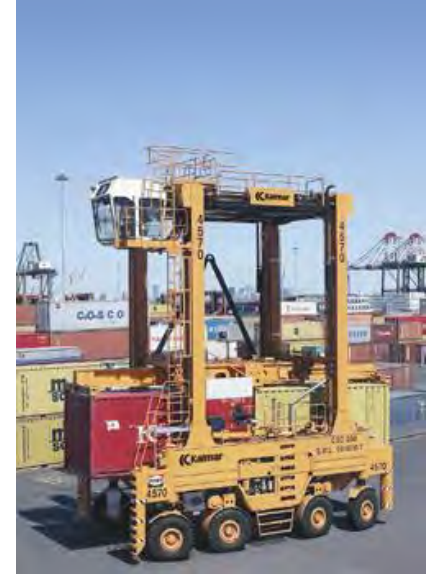




Solid engineering is the name of the innovation game

Mobile heavy machinery in Tampere

- Adding 'intelligence' to traditional machines
- Customized production for individual customers
 - Products are a mixture of solutions and industrial services
- New knowledge from on-the-site, face-to-face and hands on interactive processes with customers
- Solid and long-term innovation work
- The majority of the firms (81%) have a separate R&D unit





The core of the local innovation policy

Customized and collaborative

Mobile heavy machinery in Tampere

Proactive collaborative strategy

- Maintaining and increasing R&D intensity (generic technology focus)
- Main focus on 'applied basic research'
- Conscious efforts to tap into international knowledge hubs
- University of technology highly involved





The core of the local innovation policy

Customized and collaborative

Mobile heavy machinery in Tampere

Proactive collaborative strategy

- 'Fine-tuning is compulsory for success'
- Highly focused and customized
- Intensive legwork



Solid engineering is the name of the innovation game

Agrotechnology in South Ostrobothnia

- Adding 'intelligence' to traditional machines
- Customized production for individual customers
- New knowledge from on-the-site, face-to-face and hands on interactive processes with customers
- Solid and long-term innovation work
- The minority of the firms (33 %) have a separate R&D unit





Customized proactive and collaborative strategy

AgroTech – catching up learning for innovation


Proactive collaborative strategy

- Increasing innovation capacity and culture – learning to innovate
- Tapping into national knowledge hubs
- Simultaneously very customized to serve the cluster and generic to serve regional development more broadly
- Usability and customer-orientation important
- Distributed activity, experimentation (Agro Living Lab)





DigiBusiness in HMA

- Digibusinesses are evolving rapidly and accumulating in many ways
 - Constant search of new business ideas as well as new customer groups and novel forms of digital media
 - Customized production for individual customers
 - The minority of the digibusiness firms (32 %) have a separate R&D unit
 - A wide set of professional and user communities involved
- 





Restless dynamism is the name of the innovation game

DigiBusiness in HMA

- Identified business opportunities are tested rapidly and incorporated into the existing service portfolio of a firm
- Branding the service or product and hosting visible references from various
 - Design, brands, trademarks, social media references etc.
- Extensive use of the Internet and other digital channels to stay in touch with a rapidly developing field





Customized gardening strategy

DigiBusiness in Helsinki - making sense of an evolving field

'360 degree strategy'

- Loose focus
- Don't know what to focus on, experiment with everything interesting to find a new path
- Loosely defined policies, space for experimentation and rapid reaction – collective learning
- Focus on growth oriented SMEs and boosting interaction between SMEs and large firms



Customized gardening strategy

”Just as nature conducts many evolutionary experiments in order to have a successful species, so companies should fund many innovation projects and see which ones win out”

(Välikangas & Hamel 2003)



	DigiBusiness (Helsinki Metropolitan Area)	Mobile heavy machinery (Tampere Region)	Agrotechnology (South Ostrobothnia)
Innovation policy philosophy	<ul style="list-style-type: none">- ‘Don’t know what to focus on, let us experiment with everything interesting to find a new path’	<ul style="list-style-type: none">- ‘Fine-tuning is compulsory for success’	<ul style="list-style-type: none">- ‘This is a less-favoured region in innovation but let us strengthen our innovation capacity’
Nature of the policy	<ul style="list-style-type: none">- Reactive gardening policy- Loosely defined policies, space for experimentation, rapid reaction and collective learning	<ul style="list-style-type: none">- Highly focused and customized, collaborative	<ul style="list-style-type: none">- Proactive catch-up policy with novel solutions



	DigiBusiness (HMA)	Mobile heavy machinery (Tampere Region)	Agrotechnology (South Ostrobothnia)
Main objective	<ul style="list-style-type: none">- Creation of awareness- Reduction of fragmentation- Coaching	<ul style="list-style-type: none">- Maintaining and increasing R&D intensity	<ul style="list-style-type: none">- Increasing local innovation capacity, learning to innovate
Focus and customization	<ul style="list-style-type: none">- Focus on growth oriented SMEs and boosting interaction between SMEs and large firms- Customization is a continuous bottom-up process - projects stem out from firms' needs	<ul style="list-style-type: none">- Generic technology focus for firm specific applications, applied research- Large firm dominated- Customization is a constant act of balancing	<ul style="list-style-type: none">- Focus on the local innovation system and capacity – applied research and services for firms- Customization is a constant act of balancing



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Conclusions



Finnish innovation policy is focused, customized and multi-scalar

- Focused innovation policy prevails nationally
 - Customization occurs at all levels
 - Critics call for more active generic and explorative innovation policies
- Backward looking - the economic structure of the 90s dominates policy thinking
- National innovation system is celebrated but fragmented, inward looking and stagnating (Veugelars et al 2009)
- Multi-scalar innovation policy with tensions
- Multi-actor innovation policy arenas (Kuhlmann 2001)



- Dominant assumption: focused and customized policy is a precondition for success
 - No fear for picking the winners
 - “Small country, what else could we focus on?”
 - **Illusion of self-evidence?**
 - A need to support emergence of new ‘entities’ not well recognized
- Innovation policy aims to be adaptive to global changes and industry needs



- Sheltered spaces for collective search, experimentation and interpretation
 - where fears of the risk of private appropriation of information do not disrupt the open-ended futures oriented conversations (Lester & Piore 2004)
 - where collective sense-making is possible (learning new vocabulary, thinking, partners, etc.)
 - where one is not only learning to innovate or detecting system failures but is enabled to seek futures with relevant partners (and to find relevant partners)



There is an emerging need to redefine innovation policy

- Innovation policy is not only actions by public organisations to influence innovation but...
 - an **interactive** process; an act of balancing, re-conciling and co-ordinating for customization
 - Customization emerges from complex policy networks and discussions – **who influences who?**
 - Is innovation policy (at least to some extent) about creation of sheltered spaces for exploration and **interpretation**
 - Is innovation policy a collective sense-making process in a fast-moving and complex global economy
 - **Policy learning** for a learning economy



- RIS types, knowledge bases etc. helpful but not sufficient for customization, also need to understand...
 - **temporality** (cluster life cycles, innovation journeys, institutionalization processes)
 - **agency**
 - Social networks
 - Leadership capacity
 - Politics of innovation policy
 - Dynamic capabilities



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