

The Role of Universities in Regional Innovation Systems

Dr. Sybille Reichert
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Overview

I: Focus and Methodology of the Study

II: Drivers of Innovation Systems

III: Transformation of Roles

IV: Emerging Forms of Co-creation

V: Success Factors of Regional Innovation Systems - Enabling Role of Universities

I. Focus and Methodology

Focus:

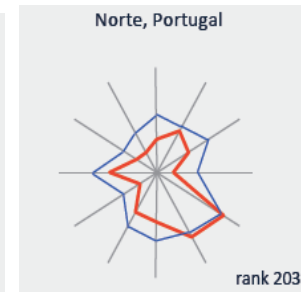
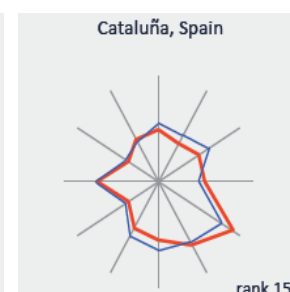
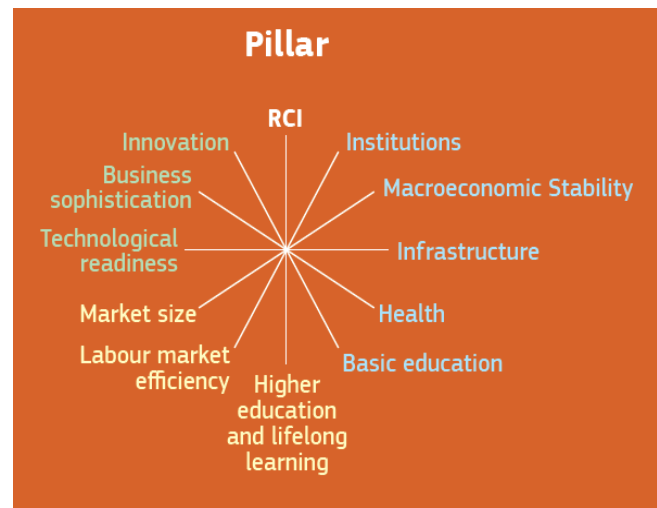
- Interaction between universities and their partners in regional innovation systems, across institutional, sectoral and disciplinary boundaries
- Transformation of roles of triple helix actors: univ., government agencies, businesses, new emphasis on quadruple helix incl. users, citizens, students
- Multi-dimensional connectivity: leadership, cultural identities & narratives, strategy development, organisational forms and infrastructures – innovation cultures

Methodology:

- Qualitative Study : 9 Case Studies in diverse EU regions with high or rising innovation indicators according to Eur. Reg. Comp. Index
- 9 x 3-day visits à 15-17 interviews (university leaders, reserachers, students, big and small companies, govern. & intermediary agencies)
- Site visit reports for each visit, overarching analysis of methods for developing connectivity, key features of dynamic regions

I. Rationale for choice of regions

1. Diversity: 9 MS, stages of development 2-5, 3 capital regions, 3 regions with large metropolitan cities, 3 with regional cities; 2 East, 2 North, 2 South, 3 Centre
2. Quantitative data as basis for hypothesis of “effectiveness” of RIS: data from EU Regional Competitiveness Index 2016 and 2013
 - absolute value of indicators,
 - relative position in country,
 - relative growth with resp. to innovation rank
 - innovation indicators
3. Good practices identified through EUA’s Smart Specialisation WG



TUM – Technical University of Munich, Germany



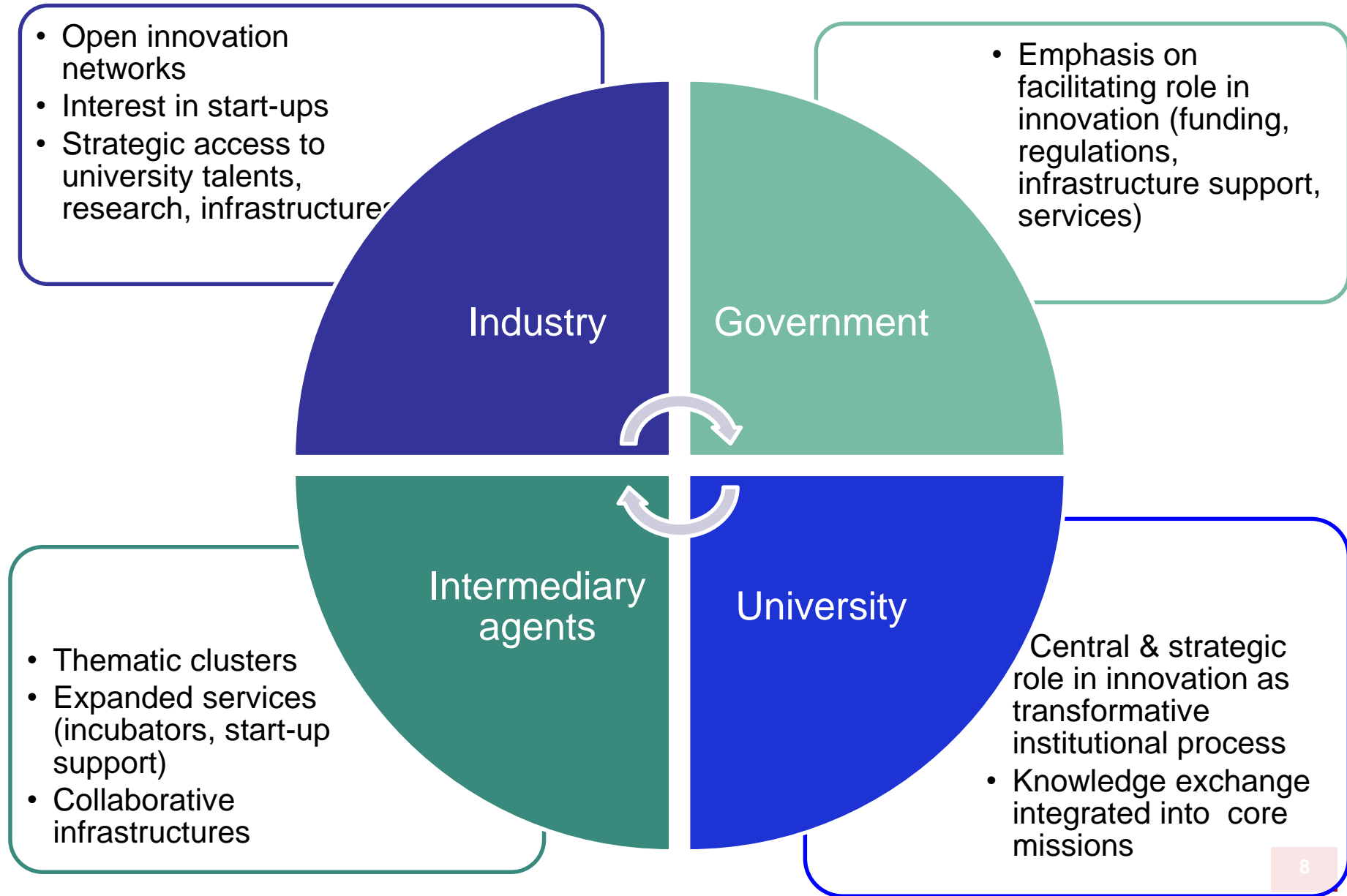
Aalto University, Finland



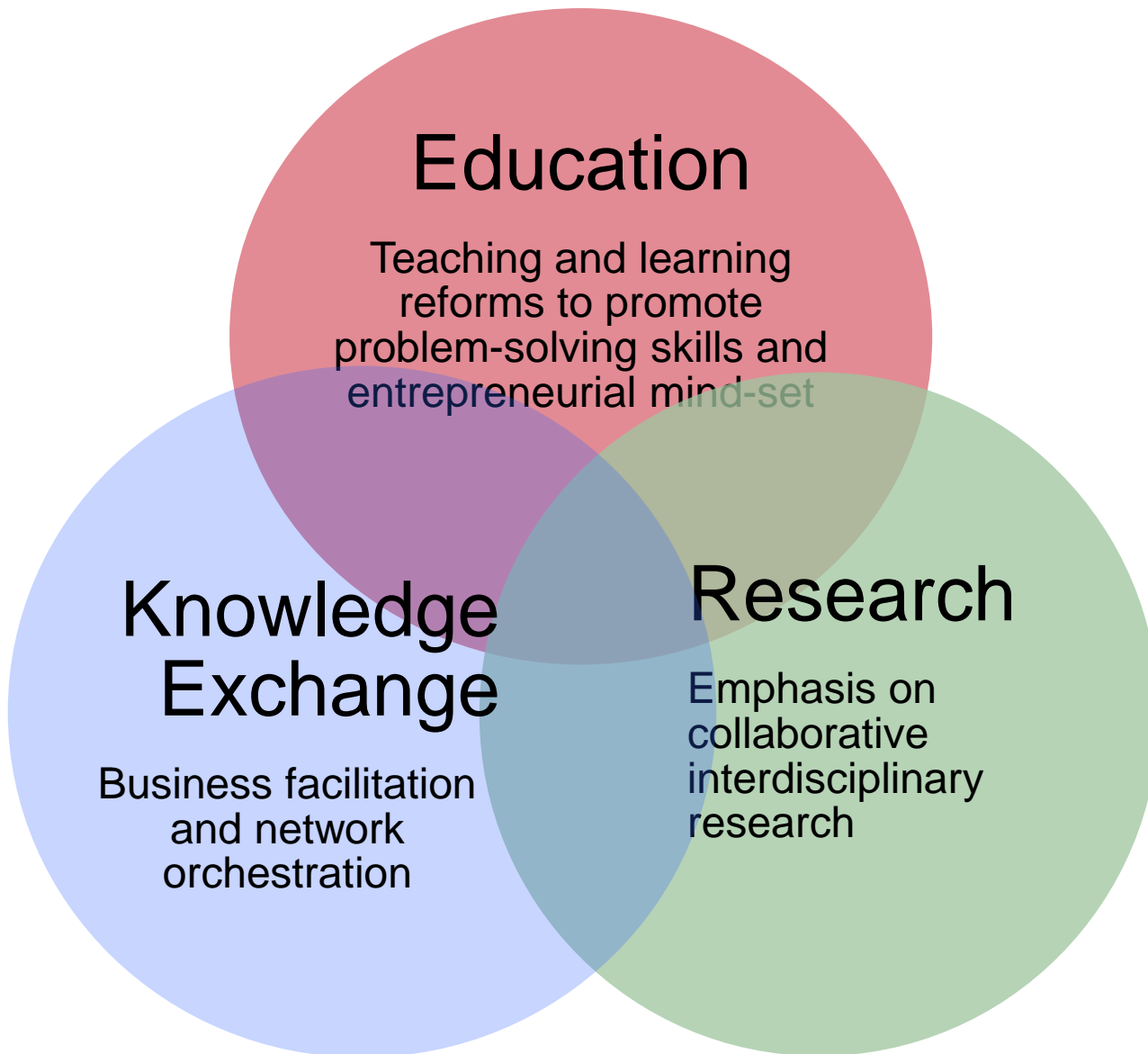
II. Driving Forces of Regional Innovation Systems Development

1. Radical transformations - digitalisation, globalisation, climate-change - global societal challenges → need for systemic multi-actor solutions
2. Increasingly “hybrid” research & innovation: disruptive innovation and scientific breakthroughs most often occur at interfaces between disciplines and different actors’ perspectives → open innovation networks
3. Emphasis on knowledge economy in post-crisis Europe - value creation highest in knowledge intensive sectors with dense connectivity between university & industry, facilitated by national, regional, city governments
4. Increased proportion of applied research funding
5. Accelerated pace of innovation → demands on agility of businesses and adaptability of universities in building research networks, nurturing talents
6. Regional strategic awareness and analysis with strategic priorities and/or common vision help to align regional actors (Smart Specialisation)
7. Generational change of culture: longing for impact and social presence in an increasingly disorienting and disembodied world

III. Transformation of Roles



III. Transformation of Roles: Innovation as a Core Mission of Universities



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Education

Teaching and learning reforms to promote problem-solving skills and entrepreneurial mind-set

- Promoting ability to address interdisciplinary problems in teams
- Project-based learning
- Teaching as coaching
- Research projects
- “Challenges” as new format to promote self-organisation and independent learning
- Emphasis on entrepreneurial attitudes and skills and start-up culture
- Professors of practice bring real-life cases to study experience
- Mentors from professional life
- Integrated internships

New needs and concerns related to U's role in innovation	Institutional responses of universities	Necessary pre-conditions, framework (Regulatory, financial) according to univ.
<p>Quality:</p> <p>What competences should be fostered and how?</p> <ul style="list-style-type: none"> • Promote digital skills • Foster entrepreneurial mind-set and skills <p>Prepare for disruptive innovation</p> <p>Promote systemic understanding and competences</p> <ul style="list-style-type: none"> • Extend research base and skills of students • Create game-changers 	<p>Teaching reforms:</p> <ul style="list-style-type: none"> • Extend project-based learning with teaching staff as coaches, incl. challenges projects, helping self-organisation, team and interdisc. Competences • Improve teaching innovation service, expectations • Extend mentoring, incl. by external stakeholders • Provide entrepreneurial modules, mentoring, as extra offer or integrated into curric. • Develop digital skills as add-on to non IT-curricula • Encourage/ support start-ups 	<p>Regulatory:</p> <ul style="list-style-type: none"> • Grant autonomy to create curricula across faculties/ departments • Grant autonomy to select students according to programme qualification profile <p>Financial:</p> <p>Low student/ staff-ratios to allow for project-based learning, orientation in diverse learning paths, and mentoring</p>
<p>Quantity:</p> <p>How to extend the skills base / to provide enough human capital for the region /nation,</p> <ul style="list-style-type: none"> • especially in STEM area, with digital know-how 	<ul style="list-style-type: none"> • Promotion of awareness and motivation in schools, with respect to STEM (e.g. targeting girls), entrepreneurial mind-set, digital skills • Service /contact point for schools that want to update 	<p>Regulatory:</p> <ul style="list-style-type: none"> • Provide fiscal/tax relief for employers/ employees for CPD to be able to pay tuition (legally not allowed to be supported by public means)

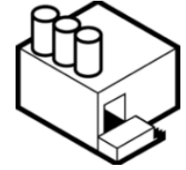
Examples:

Aalto Design Factory

TU/e Challenge Projects

Manchester Univ. Stellify

TUMentreprenurship education/ StarTUM



WHAT IS DF

Aalto Design Factory (ADF) is an interdisciplinary product design and learning hub uniting students, teachers, researchers, and industry. We aim to build a new kind of passion-based learning culture for Aalto University. You are welcome to join us!

DESIGN FACTORY

Educating the world's best product designers

MANCHESTER
2024
The University of Manchester

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TU/e innovation Space

TU/e innovation Space is a community and facility that supports interdisciplinary hands-on education, engineering design and entrepreneurship.



TU/e innovation Space

Students

Projects

Industry

Blog Tom Selten and Bas Verkaik

Events

Our people

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WELCOME!

TU/e innovation Space is a community and facility that supports interdisciplinary hands-on education, engineering design and entrepreneurship.

It's a place where students learn to deal with complex societal and industrial challenges, create prototypes and develop innovations in collaboration with researchers, businesses and each other.

Furthermore, it provides a space and support for lecturers that develop and offer hands-on courses and want to contribute to innovation in education.

COMMUNITY PLATFORM →

TU/e

iINNOVATION SPACE

STEL•LI•FY (VERB)

TO CHANGE, OR BE CHANGED, INTO
A STAR

The University of Manchester gives you the opportunities to do more and be more. We call it Stellify. It's about broadening your horizons, understanding the issues that matter, and stepping up to make a difference to the local and global community.

Stellify enables you to do more and be more during your time at university, with a select package of activities containing some of Manchester's most exciting and transformational student experiences – and the chance to earn a prestigious University award.

Start your Stellify journey.

III. Transformation of Roles: Innovation as a Core Mission of Universities

Research

Importance of collaborative
research

Interdisciplinary “incubation”

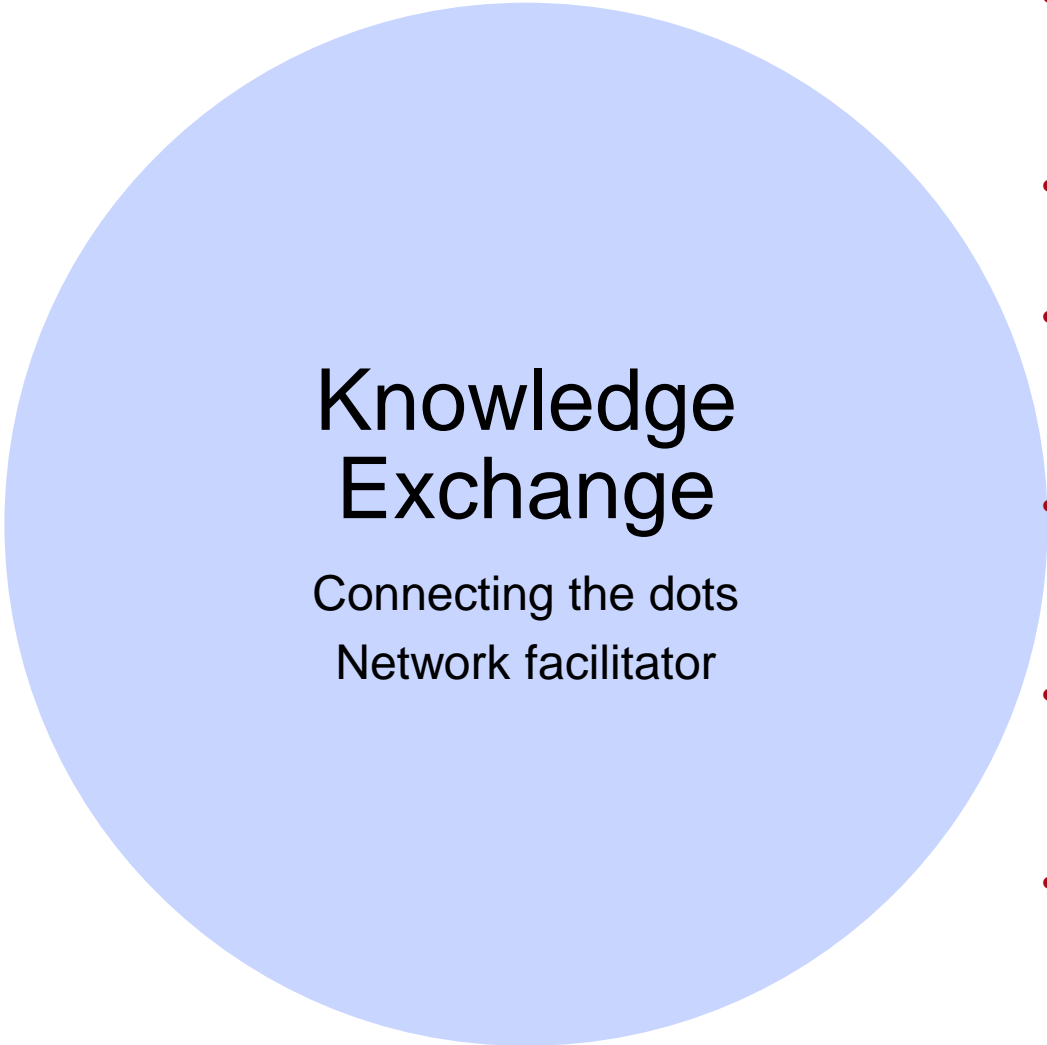
- New formats: strategic partnerships, less contract research more long-term development of new technologies, long-term framework agreements for research collaboration; joint infrastructures
- Tension or win-win between curiosity-driven research and user-driven applied research?
- Research excellence supportive of collaboration with big industry and long-term orientation – but SME collaboration often more short-term solution oriented
- Independent, disinterested public interest-oriented, curiosity-driven attitude important for network orchestration

Strategic Business-University Collaboration

Cooperation instrument/ Interaction format	Function for businesses, universities, students
Joint Institutes or Labs	<ul style="list-style-type: none"> • helps address long-term challenges which are of mutual interest to academia and industry • helps support state-of-the-art infrastructure and thereby enhances international competitiveness • co-funding (companies/public funds) alleviates public budget pressures
Long-term framework agreements for university-company collaboration	<ul style="list-style-type: none"> • lowers transaction costs for individual cooperation projects • creates transparency and reliability with respect to IP arrangements, preventing mistrust • helps justify long-term research infrastructure investments for companies and universities
Strategic partnerships	<ul style="list-style-type: none"> • helps companies address long-term ambitions by giving them access to scientific and technological frontiers • scan future technologies, problems and opportunities which may require early positioning • helps universities develop long-term research directions with high demand from external stakeholders

Dimension of University Mission	New needs and concerns related to U's role in innovation	Institutional responses of universities	Necessary pre-conditions, framework (Regulatory, financial) according to univ.
Research Produce new knowledge <div>Research</div>	Produce relevant research: but what is relevant? <ul style="list-style-type: none"> Short-term: concrete solutions to current innovation problems Long term: scanning horizon of scientific, technological and user developments Connecting different actors to address common innovation challenge in knowledge-intensive areas Address economic and societal challenges and disruptions 	<ul style="list-style-type: none"> Contracted research Research support and business facilitation service as contact point for businesses Support basic research with long-term perspectives Strategic partnerships with few companies, organisations, including foresight/ think tank function Promote interdisciplinary networks Create and moderate them clusters bringing together diverse disciplines and institutions Adapt hiring policy to combine research excellence and impact criteria 	Regulatory: <ul style="list-style-type: none"> Grant sufficient autonomy to allow for flexible, strong interdisciplinary units Financial: <ul style="list-style-type: none"> Support schemes for univ./business collab., esp. in areas of high innovation potential Support basic research at universities with long-term perspectives through sufficient base funding Provide medium-term competitive grants for thematic cluster development
	Access to res. infrastructures: <ul style="list-style-type: none"> Large state-of-the-art infrastructures to share since they are too costly for one company to buy/maintain 	<ul style="list-style-type: none"> Investment in large research infrastructures in areas strategic priority, thematic focus areas, s.t. as PPP Provide long-term technical staff for infrastructures 	Financial: <ul style="list-style-type: none"> Provide sufficient institutional base funding for smaller infrastructural investment, maintenance, technical staff

III. Transformation of Roles: Innovation as a Core Mission of Universities

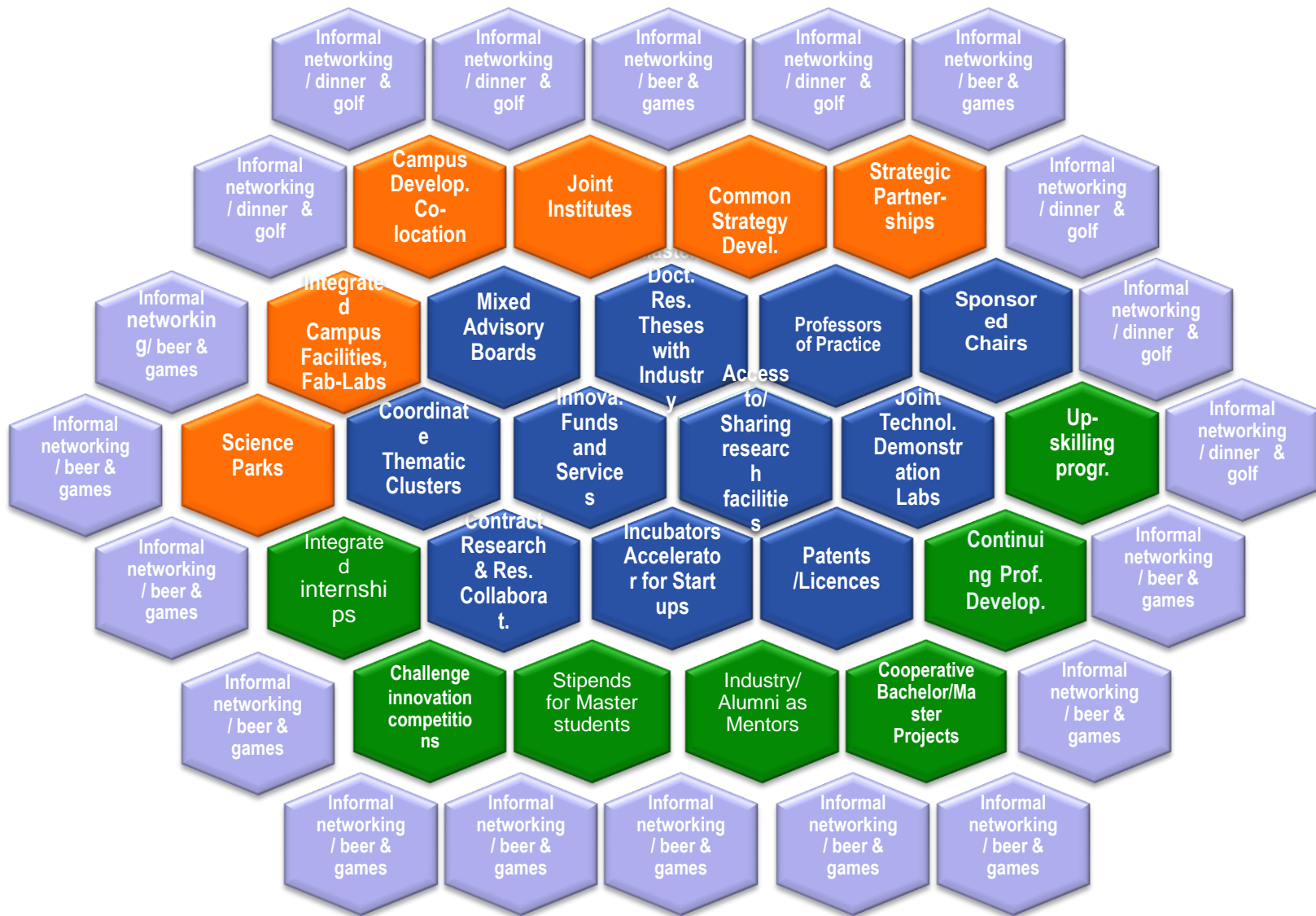


Knowledge Exchange

Connecting the dots
Network facilitator

- Knowledge Exchange not add-on but integrated into teaching and research programmes
- TTOs expanded, but not as central to strategic agenda
- Increased emphasis on start-up support and entrepreneurial culture
- Business facilitation and research networks more central
- Joint thematic clusters = bridges between curiosity-driven research & application
- Infrastructures (start-up hubs, fablabs, maker spaces) as collaborative spaces for multi-actor innovation

Portfolio of University Knowledge Exchange Formats for Joint Regional Development



IV. Triple Helix Co-Creation Structures

Connective Structures & Infrastructures	University role / contribution	Business role / contribution	Government contribution
University Research Centers with Impact Mission / Inter-face Research Centers	<p>University research with international visibility attracts national and international funds and talent to the region.</p> <p>Provide researchers and facilities for applied research and prototype development</p>	<p>Companies and public external stakeholders adopt research in their development and cooperate to meet challenges together</p> <p>Funding and expertise for IP and commercialisation</p>	<p>Competitive funding to meet societal/ economic challenges</p> <p>Adapting regulations to meet challenges</p> <p>Co-Funding for Centers</p>
Joint Labs or Industry Labs on Campus	<p>Research expertise</p> <p>Global research partners</p> <p>Researchers (master students, PhD, postdocs)</p> <p>Tech transfer services</p>	<p>Funding for PhDs</p> <p>Funding for research infrastructures</p> <p>IP and prototyping services</p> <p>Venture capital for start-ups/ inventions</p>	<p>Infrastructure</p> <p>Building permit</p> <p>PPP regulations</p> <p>Special framework contract for PPP accounting</p>
Joint Campuses, Science Parks	<p>Openness to external partners, PPP, in research and education to create dynamic campus environments</p>	<p>Infrastructural Investments</p> <p>PPPs with long term perspective</p>	<p>Urban planning and zoning laws allowing mixed use</p> <p>Infrastructural investments</p> <p>Orchestrating use of EU structural funds</p> <p>Lobbying for European and national funds</p>

Multi-actor Quadruple Helix Co-Creation Network: Challenge-driven Innovation



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City as Living Lab, Service Facilitator, Funding Agency
and Political Lobbyist

NEW IDEAS FOR A
DYNAMIC
CITY >



University as Research Hub, Technology Foresight, Network Facilitator
Provider, State-of-the-Art Research Infrastructure, TechTransfer

WELCOME TO
CARNET



The **Cooperative Automotive Research Network**, initiated by SEAT, Volkswagen Group Research and the Universitat Politècnica de Catalunya (UPC), is an open hub for industrial and academic partners from the areas of automotive and mobility research & innovation. CARNET is located in Barcelona, and works through project-based collaboration. It focuses on innovation and solutions that close the gap between academic research and industrial innovation in urban mobility.

VW Electronic Research
USA



Regional Innovation “Ecosystems”

- Density of knowledge production – opportunities connected to geographic proximity, but such proximity is being used systematically
- Interdependence of actors (& awareness thereof), actively looking for synergies, mutual reinforcement – “local buzz”
- Interlinked aligned set of leaders, alignment through cultural norms, history, common narratives, strategies, structures, infrastructures
- Quest for coherence or systematic approach to regional development (in smaller regions, or different sectors of larger regions)
- All dimensions of development addressed, with search for synergies
- Making use of each others’ facilities, networks and “global pipelines”, mutual access, through targeted events and collaboration
- “Eco” = life, nutrition (external inflow of ideas, people), adaptation to changing conditions, organic growth, open eco-systems: exchange of energy and matter with outside

Quadruple Helix Cooperation in Regional Innovation Systems creates three-dimensional coherence and builds a common innovation culture

Connective Leadership
Connective Cultural Norms

Organisational Coherence

Common norms, values, narratives, social glue

Building trust

Collaborative disposition

Lasting connectivity through joint institutional structures, common agenda, joint decision-making and resource allocation

Connective Strategies
Connective Organisational Forms

Social Coherence

Provide collaborative co-creation spaces with flexible central urban architecture,

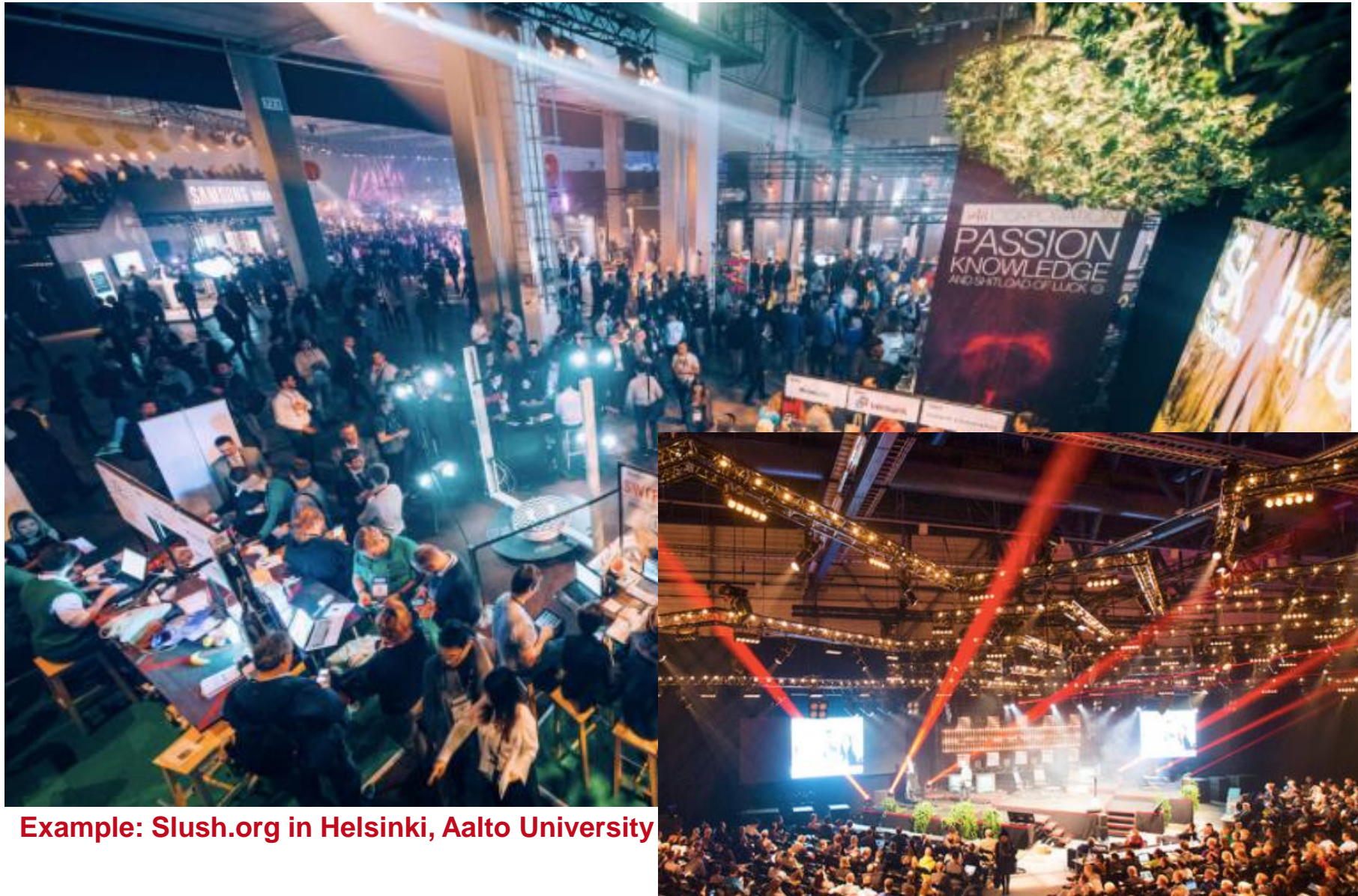
Maximising chance encounters, relevant events, services, technical facilities

Spatial Coherence

Connective Collaborative Spaces

university's new centrality = orchestrating multi-actor innovation networks

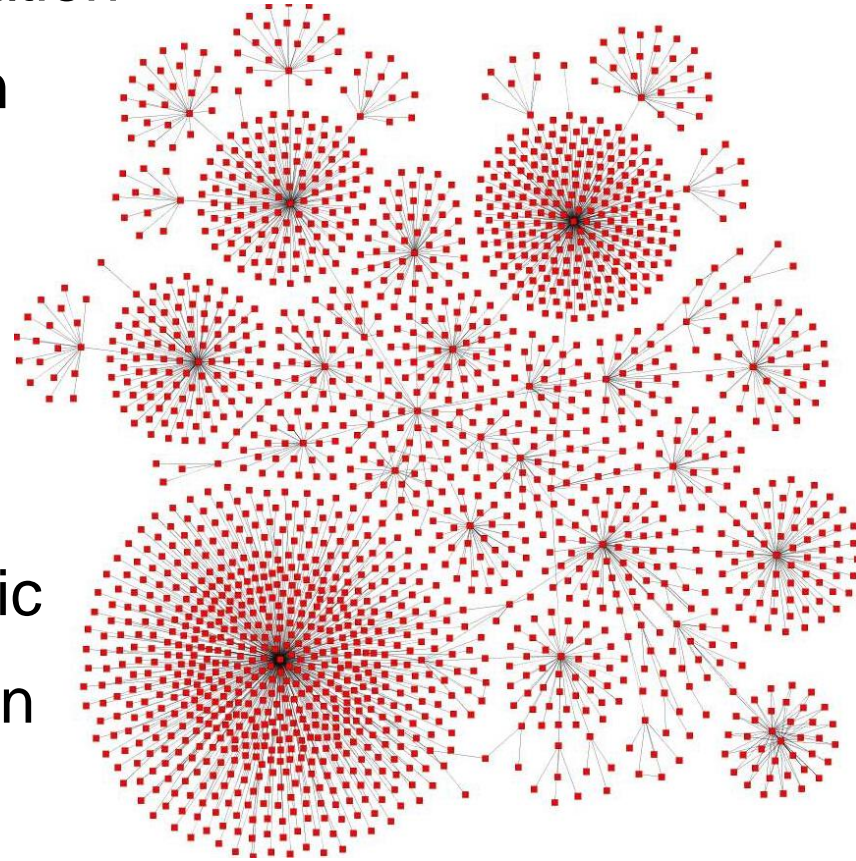
V. Nurturing Innovation Cultures



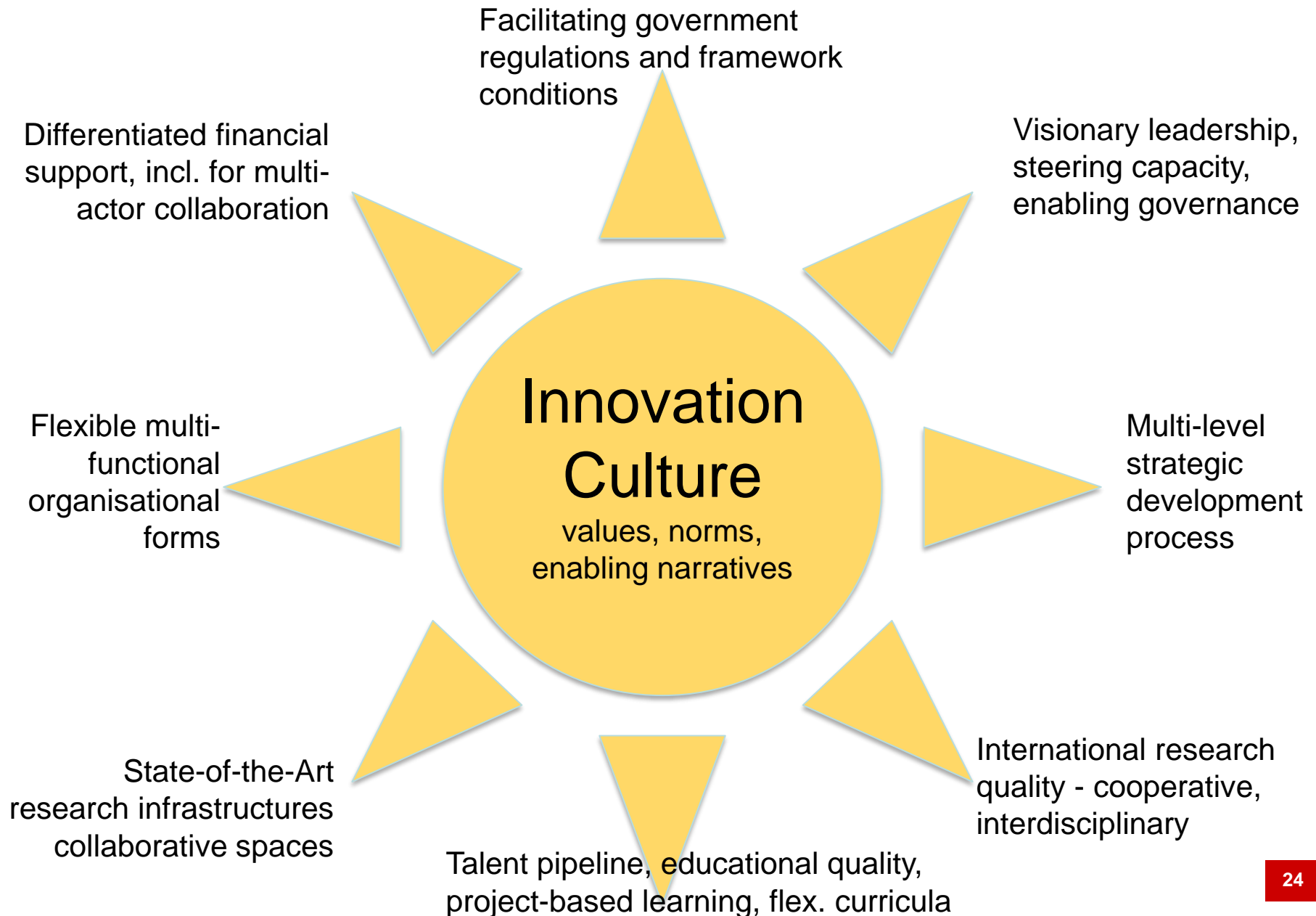
Example: Slush.org in Helsinki, Aalto University

V. New Innovation Concepts and Dynamics

1. From linear to reiterative innovation
2. From closed to open innovation
3. From technological to systemic challenge-driven
4. From individual to collaborative interdisciplinary innovation
5. From spontaneous to systematic
6. From exchange to co-creation in innovation spaces
7. From projects to innovation cultures



V. Success Factors of Reg. Innov. Systems



Thank you for your attention!

sybille@reichert-consulting.de

www.reichert-consulting.de