

Nurturing Innovation – New Connective Formats of University Development

Dr. Sybille Reichert

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Overview

I: Drivers of Connectivity

II: New Connective Formats

III: Challenges of New Connective Formats

IV: Conclusions, Outlook, Questions

The Drivers

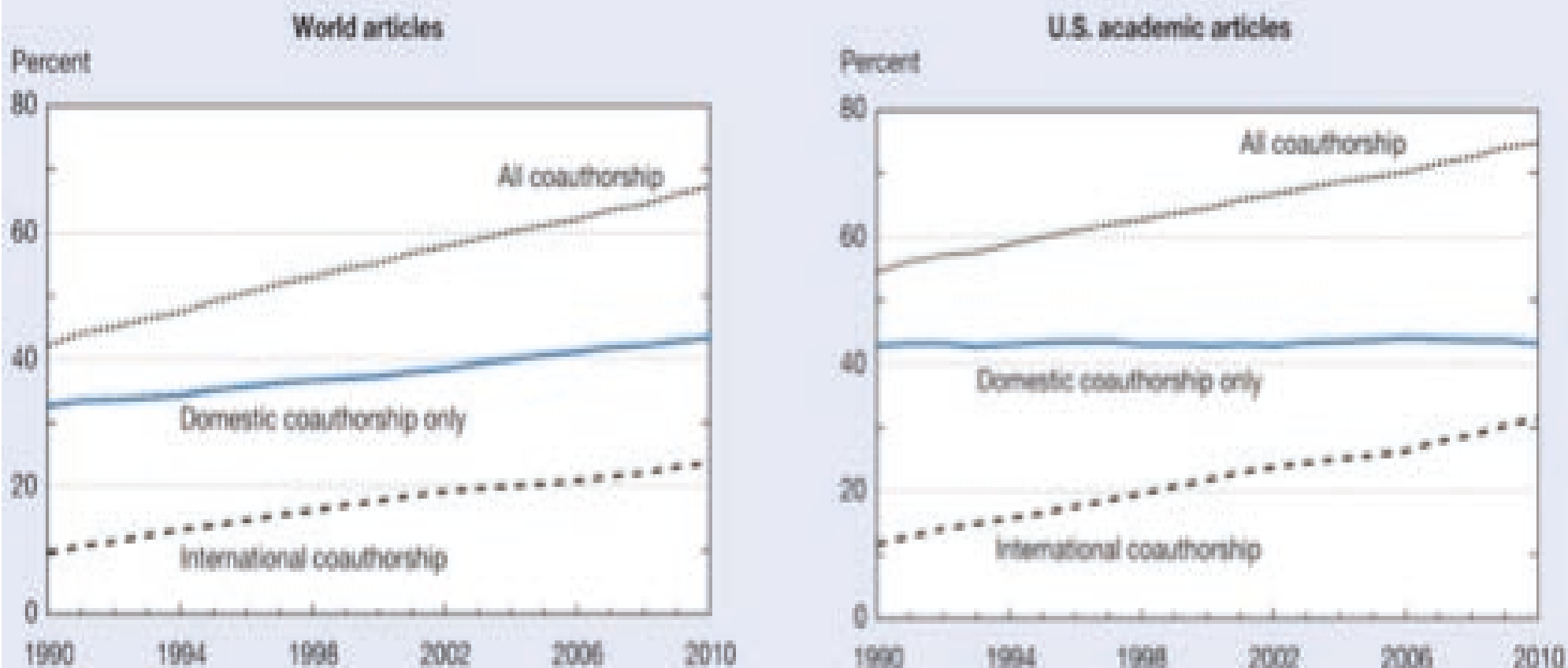
Driving Forces of Increased Connectivity:

Endogenous factors

1. Increased specialisation – increased need to collaborate to address scientific challenges
2. Interdisciplinary “hybridisation” of research: Awareness that radical innovation or scientific breakthroughs most often occur at interfaces between disciplines increases interest in interdisciplinary networks
3. Increasing national and global competition – increased need to create international visibility through critical mass, large clusters
4. Generational change of culture: impact-driven, team-oriented, need to be owners of their learning and research processes
5. Low level of university basic funding make universities respond to external funding schemes, most often demanding promoting collaboration

Figure 5-25

World and U.S. academic S&E articles coauthored domestically and internationally: 1990-2010



NOTES: Article counts from set of journals covered by Science Citation Index (SCI) and Social Sciences Citation Index (SSCI). Articles classified by year they entered database, rather than year of publication, and assigned to country/economy on basis of institutional address(es) listed on article. Articles on whole-count basis, i.e., each collaborating institution or country credited one count. Internationally coauthored articles may also have multiple domestic coauthors.

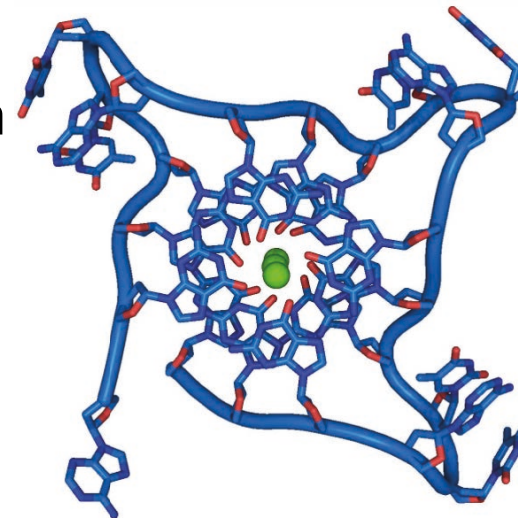
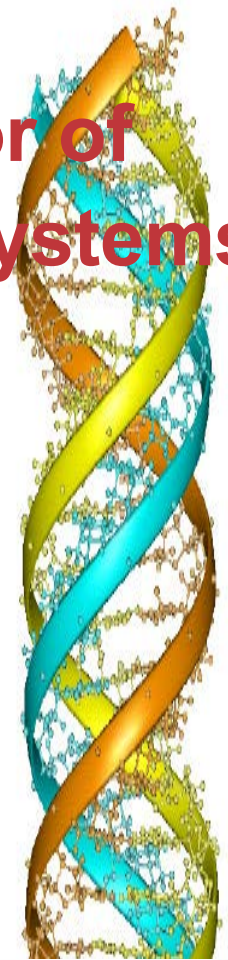
SOURCES: National Science Foundation, National Center for Science and Engineering Statistics, and The Patent Board™, special tabulations (2011) from Thomson Reuters, SCI and SSCI. http://thomsonreuters.com/products_services/science/

Driving Forces of Increased Connectivity: Exogenous Factors – (Regional) Innovation

1. Open innovation – networking with external partners even for core innovation processes
2. Multiple “hybridisation” technologies & innovation: Awareness that radical innovation or technological and market breakthroughs most often occur at interfaces between technologies and different actors’ perspectives
3. Global competition: need to be at the forefront of technological and market development – aware of new opportunities, agility, multiple perspectives
4. Accelerated pace of innovation creates increased demands on adaptability and agility of businesses and universities
5. Value creation highest in knowledge intensive sectors with dense connectivity between univ. & industry, high absorption of new knowledge
6. Global challenges need systemic solutions (scientific, technological, digital, environmental, social, political transformations are interrelated)
7. Regional and urban revitalisation focuses on innovation clusters, districts
8. Funding schemes to support such collaboration (clusters, science parks etc.)

Regional Expectations of University as Motor of Knowledge Regions / Regional Innovation Systems

- With global communication local knowledge networks become more important as regional asset (path dependencies, tacit knowledge flows)
- New strategic attention to joint attraction of talents, institutions (Foreign direct investment, research grants)
- Regional innovation and globalisation become complementary - regions = windows onto global competition and challenges
- Systematic use „triple or quadruple helix“ cooperation „Knowledge economies need multi-actor solutions“
- Close dialogue with companies, users, citizens, students, on societal challenges (Quadruple Helix)



Success factor connectivity

The success of a university in national or international competition depends increasingly on its permeability and connectivity in relation to the newest developments in science and technology, society and economy.

- Support interdisciplinary, inter-institutional, inter-sectoral networked research
- Provide flexible and differentiated offer and transitions in teaching to cater to diversified student body
- Cater to need for innovation competences, critical minds, ability to connect different perspectives, ability to address challenges in diverse teams, embrace and address change, disruptive transformations, entrepreneurial mind-set, „game-changers“

The connective ability of a university and success in orchestrate networks depends not only on the density of its networks but its ability to identify strategic opportunities amongst web of cooperations, to prioritise them and support and amplify them selectively.

New Connective Formats – Transversal Organisational Units

New Organisational Types for Research

- **Graduate Schools** (*Graduiertenkollegs*, *Graduiertenschulen*, reaching across faculties, third-party funded) (83%)
- **Research Focus Areas, Centers or Clusters** (*Sonderforschungsbereiche*, *DFG-Forschungszentren* or *Exzellenzcluster*), network of university members, some external partners (80%)
- **Research Centers** with external private partners (Public-private-Partnerships, Industry-on-Campus-coop.) (40%)
- **Centers for Advanced Study** (*Wissenschaftskollegs*) (29%)

Stifterverband
für die Deutsche Wissenschaft

Heinz Nixdorf Stiftung

<http://www.stifterverband.org/hochschulstrukturen2020>



Ex. German Excellence Initiative as catalyst of institutionalised international research networks

- Identification of research strengths, on the basis of strategic information
- Definition / development of research priorities
- Strategic hiring follows such priorities
- Dissolving boundaries between basic and applied research
- Innovative concepts for promoting emerging fields/ strengths
- Increased readiness to redistribute resources
- Concentration on (small number of) strategic priorities - Long-term profile or medium-term priorities? Emergence of new strengths?
- Strong focus on young researchers (support, early independence)

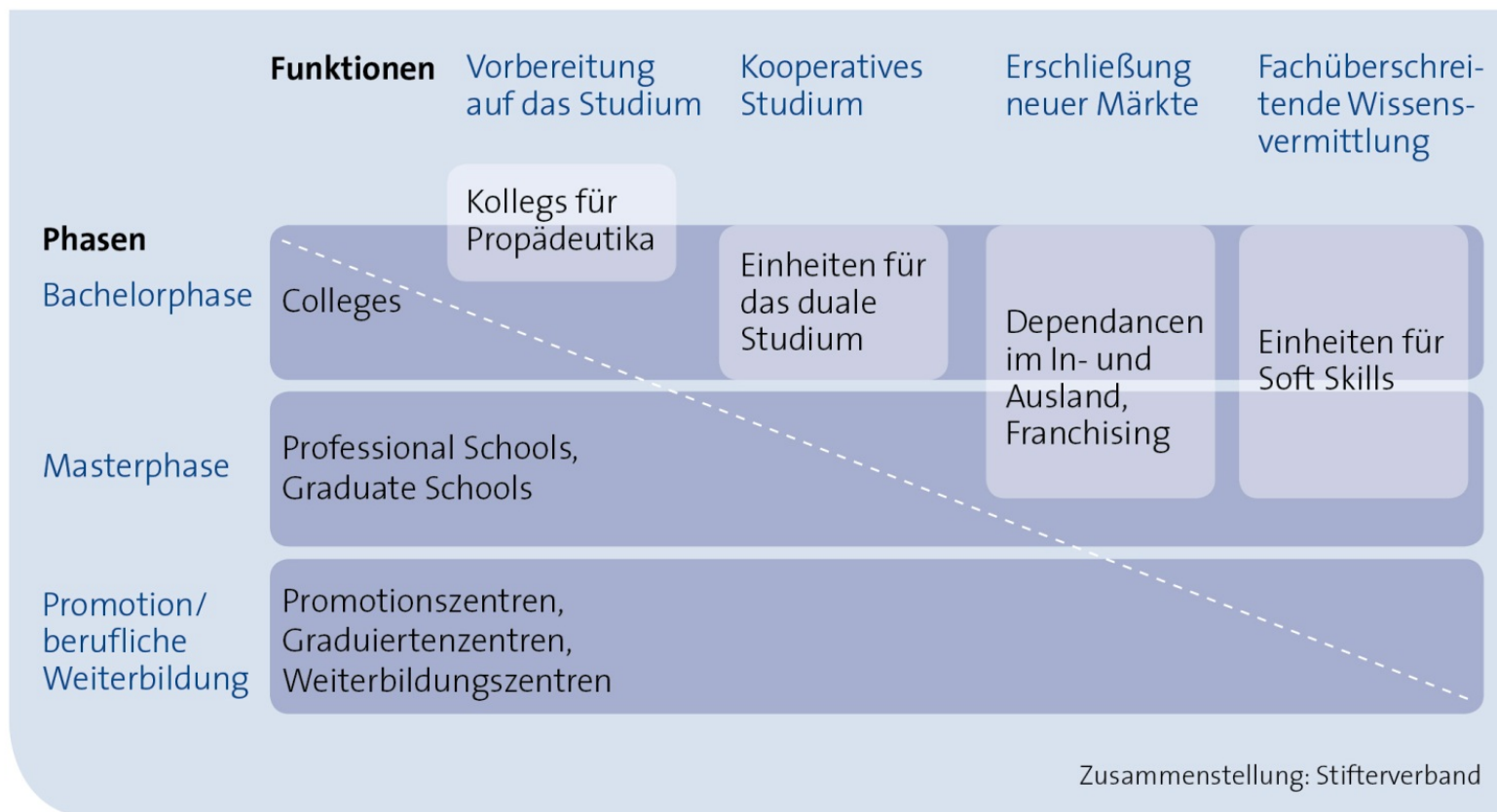
→ Increased institutional steering / positioning in international competition

Advantages of new research strategic clusters / units

- Identification and strengthening of (institutional homes and lobbying for) new research themes
- Structural support for interdisciplinary cooperation, pooling of resources, critical mass, high performance
- Concentration of resources around thematic clusters → “profiling” & institutional visibility
- New and more flexible resources
- Recruitment of star scientists and best qualified PhD candidates, flexibility, research infrastructure – internal stratification
- Strengthening relevance of research through cooperation with external regional partners (research institutes, companies)

New Organisational Types for Teaching and Learning

Abbildung 2: Neue Einheiten in der Lehre – Phasen und Funktionen



Advantages of new transversal teaching units

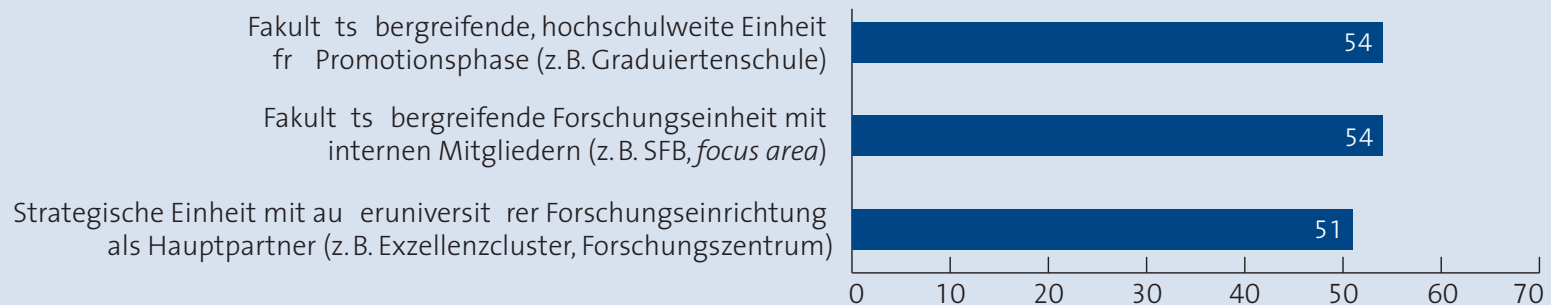
- Attention and recognition of teaching quality and innovation
- Development and organisation of inter- or transdisciplinary teaching offer, for special target groups or phases
- Establishment of a new teaching philosophy, development of integrated teaching approaches, student-centered teaching
- Professionalised management of teaching and learning
- Definition and development of common teaching quality standards
- Development of new counselling, tutoring and support services for students
- Coordination of teaching cooperation

Strategic Significance of New Units

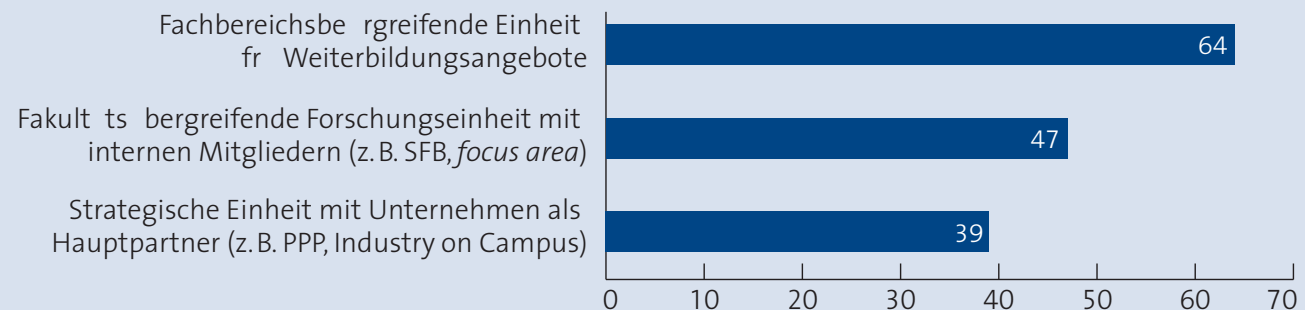
Abbildung 4: Strategisch bedeutsame Organisationseinheiten

Anteil der Hochschulen, die angeben, dass die genannte Organisationseinheit für die Weiterentwicklung ihrer Hochschule die größte Bedeutung hat, Angabe der drei am häufigsten genannten Einheiten, in Prozent

Universitäten



Fachhochschulen

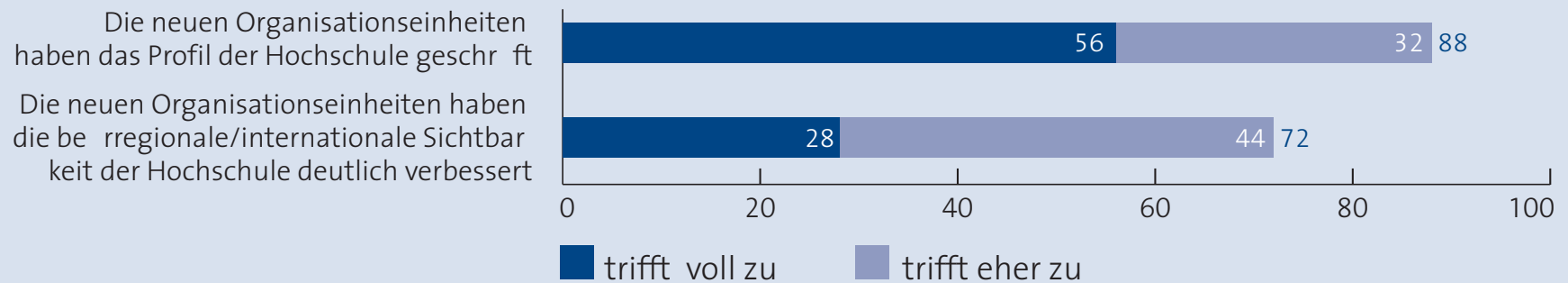


Quelle: Stifterverband

Contribution to Institutional Profile

Abbildung 11: Neue Organisationseinheiten wirken sich auf das Hochschulprofil aus

Anteil aller Hochschulen, die angeben, dass die bei ihnen vorhandenen Organisationseinheiten insgesamt folgende Auswirkungen im Hinblick auf die Hochschule haben, in Prozent



Quelle: Stifterverband

Focus of the EUA Study on the Role of Universities in Regional Innovation Systems (publ. March 2019)

The EUA study on the role of universities in regional innovation ecosystems shows

- how universities and their partners in regional innovation systems build bridges across institutional, sectoral and disciplinary boundaries,
- how they look for new collaborative formats and spaces, increasingly aiming at co-creation, in order to address shared challenges,
- how their own roles change in the process.

Changing Role of Actors

- Governments: facilitator role increasingly important (funding intermediary structures, e.g. clusters, brokers, collaboration units, VC), regulator role imp. (univ. autonomy, setting industrial standards, giving funds and political autonomy to the region/ city)
- Companies: open innovation more advanced: big companies' (and univ.) interest in start-ups, (non spin-off) SMEs' interface and access to universities still a challenge; strategic partnership for long-term developments
- Universities more oriented tow. impact in technological, economic, social innovation, post-crisis emphasis on knowledge economy and innovation
- Important role of start-ups in eco-systems – univ. as important breeding ground for start-up ideas and actors
- VC as new actor on the block: business angel, important role of assessing businesses and strategies, markets, technologies,
- Important role of intermediaries: univ. services (emphasis on start-up support and business facilitation), applied research centres with integrated tech transfer, clusters, network orchestrators, incubators, science parks
- Infrastructures as collaboration spaces / intermediary agents

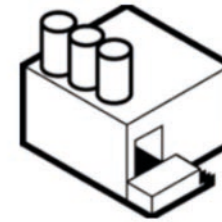
Changing Role of the University: understanding the importance of multi-actor networking

- **Education:** talent creator/ provider
 - educational reform efforts wide-spread (most systematic: TU/e, Aalto) emphasise project-based learning, need for coaching and mentoring independent problem solving of real-life problems in interdisciplinary collaboration in teams, challenge projects
 - foster entrepreneurial culture (rather than teach entrepreneurial skills or business basics)
- **Research:** future lab, systemic solutions for complex challenges
 - increased importance of collaborative research with business, but often on new footing (strategic partnerships, less contract research more long-term development of new technologies);
 - increased emphasis on interdisciplinary research, bridging technologies
 - Win-win or tension or balance between curiosity-driven research and problem-solving / user-driven applied research
 - research excellence supportive of collaboration with big industry
- **Knowledge Transfer:** networking facilitator
 - New emphasis on start-up support and entrepreneurial culture
 - TTOs expanded but not as central to strategic agenda
 - networking in thematic clusters emphasised

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.
Education Provide human capital	Quality: What competences should be fostered and how? <ul style="list-style-type: none"> Promote digital skills Foster entrepreneurial mind-set and skills Prepare for disruptive innovation Promote systemic understanding and competences Extend research base and skills of students Create game-changers 	Teaching reforms: <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 	Regulatory: <ul style="list-style-type: none"> Grant autonomy to create curricula across faculties/ departments Grant autonomy to select students according to programme qualification profile Financial: <ul style="list-style-type: none"> Low student/ staff-ratios to allow for project-based learning, orientation in diverse learning paths, and mentoring
	Quantity: How to extend the skills base / to provide enough human capital for the region /nation, <ul style="list-style-type: none"> especially in STEM area, with digital know-how also as continuing professional development for employers, helping their adaptability re-skill, upskill in response to innovation needs 	<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 and develop teaching skills Extend CPD offer, tailor-made to business needs, incl. contact points for easy access of businesses to universities 	Regulatory: <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) Financial: <ul style="list-style-type: none"> Provide enough resources for staff time to invest in support for schools Provide incentives for CPD in areas of high innovation

Education

Example: Aalto Design Factory



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

Example: Eindhoven Challenge Projects

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

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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.

f y i

TU/e innovation Space

- Students
- Projects
- Industry
- Blog Tom Selten and Bas Verkaik
- Events
- Our people
- Contact us

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

iNNOVATION SPACE

Example: University of Manchester Stellify

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NICOLAS MARIN



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Msc Global Urban Development and
Materials Science and Engineering

French and Spanish

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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.

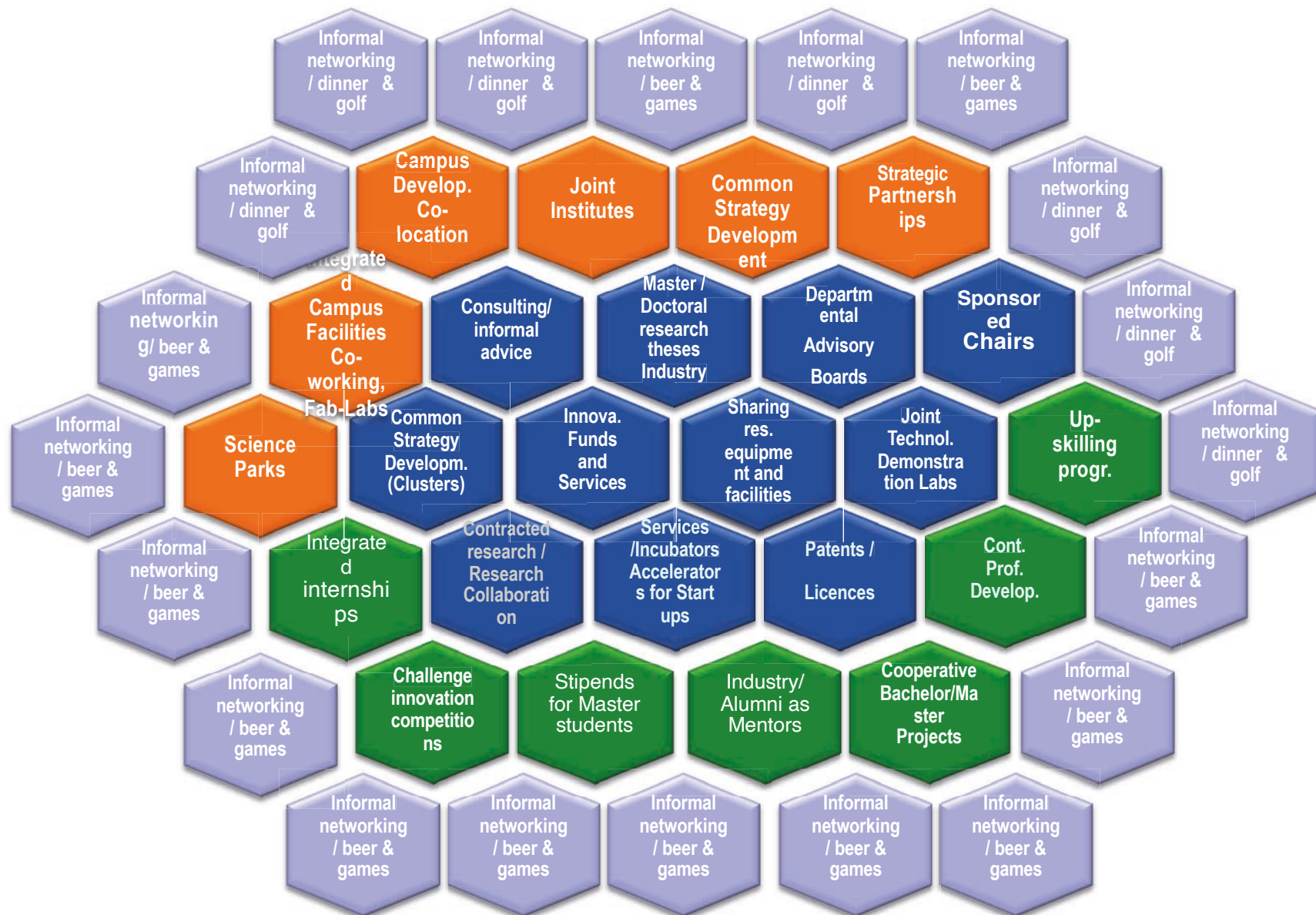
Start your Stellify journey.

Dimension of University	New needs and concerns related to U's role in innovation	Institutional responses of universities	Necessary pre-conditions, framework (Regulatory, financial)
Research Produce new knowledge Research	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 & 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 thematic 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 • technical facilities and 	<ul style="list-style-type: none"> • Investment in large research infrastructures in areas of strategic priority, thematic focus areas, s.t. as PPP • Provide long-term technical staff for infrastructures • Establish co-creation spaces, 	Financial: <ul style="list-style-type: none"> • Provide sufficient institutional base funding for smaller infrastructural investment, maintenance, technical staff • Provide special

Knowledge exchange

Transfer and exchange knowledge	<ul style="list-style-type: none"> Facilitate joint innovation between universities and companies, public organisations 	<ul style="list-style-type: none"> Create incentives to reward academic staff to engage in cooperation for external societal/ economic impact Create joint labs with external partners Establish and use advisory boards at cluster/faculty/ subject-area level to develop common win-win agendas Develop framework contracts for high density partners Expand research contract support and business facilitation service 	<p>Regulatory:</p> <ul style="list-style-type: none"> Facilitate PPP by helping to minimise regulatory hurdles and transaction costs <p>Financial:</p> <ul style="list-style-type: none"> Provide competitive support schemes for common research and research structures Provide sufficient base funding to allow universities to be equal partners in joint structures
	<ul style="list-style-type: none"> Create and protect value from IP Create new businesses with high innovation growth potential 	<ul style="list-style-type: none"> Expand technology transfer/IP service Create/ expand start-up support service and spaces for students and researchers Connect with external start-up services, science parks, VCs 	<p>Regulatory and Financial:</p> <ul style="list-style-type: none"> Provide financial support for business creation and growth Establish or support establishment of Venture Capital in areas with high potential (high/deep tech)
	<ul style="list-style-type: none"> Help social innovation to prevent ecological disaster, reduce inequality, promote participation and solidarity 	<ul style="list-style-type: none"> Reward engagement for social innovation symbolically and in career advancement 	<ul style="list-style-type: none"> Create financial incentives to reward research and teaching engagement for social innovation

Portfolio of University Knowledge Exchange Formats for Joint Regional Development



Overview of Co-Creation Structures

Connective Structures & Infrastructures	University role / contribution	Business role/ contribution	Government contribution
Strategy Boards	Foresight of emerging research fields and technology developments	Foresight of emerging markets and technology developments	Regional or municipal development perspectives and investment planning
Research Thematic Clusters	<p>Different disciplinary and interdisciplinary research expertise on latest and future developments of thematic area</p> <p>Access to international research partners (global pipeline)</p> <p>Ideas for new research directions /projects</p> <p>PhD students and other researchers as experts of the sector Graduates</p>	<p>Expertise on market developments and potential</p> <p>Applied research and development expertise</p> <p>Global partners</p> <p>Knowledge of global economic developments</p>	<p>In some cases funding for cluster staff</p> <p>Funding for research conducted by regional cluster partners priority areas</p> <p>Targeted start-up funds for priority thematic areas</p>
Start-up, tech transfer or innovation services	<p>Students and researchers with business ideas</p> <p>Community building among students/ researchers</p> <p>Marketing and communication of events</p> <p>Financing and training staff</p> <p>Allowing commercialisation as acceptable pursuit</p>	<p>Mentors</p> <p>Jury members</p> <p>Venture Capital</p> <p>Partners for start-ups (e.g. as first clients or demonstration cases)</p> <p>Mentorship and financial support for IP</p> <p>IP service</p>	<p>Funding for service staff, space and buildings</p> <p>Funding and framework for venture competitions</p> <p>Start-up grants</p> <p>S.t. service co-funded or wholly provided by government agency</p>
Joint Core Technical Facilities or Large Research Infrastructure	<p>Technical know-how and staff to ensure maintenance</p> <p>Research and technical expertise to ensure state-of-the-art and develop methodology, access to research infrastructure funding, staff</p>	Funding for infrastructures technological expertise	Funding for infrastructures

Overview of Co-Creation Structures

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

Example Interface Unit

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DYNAMIC
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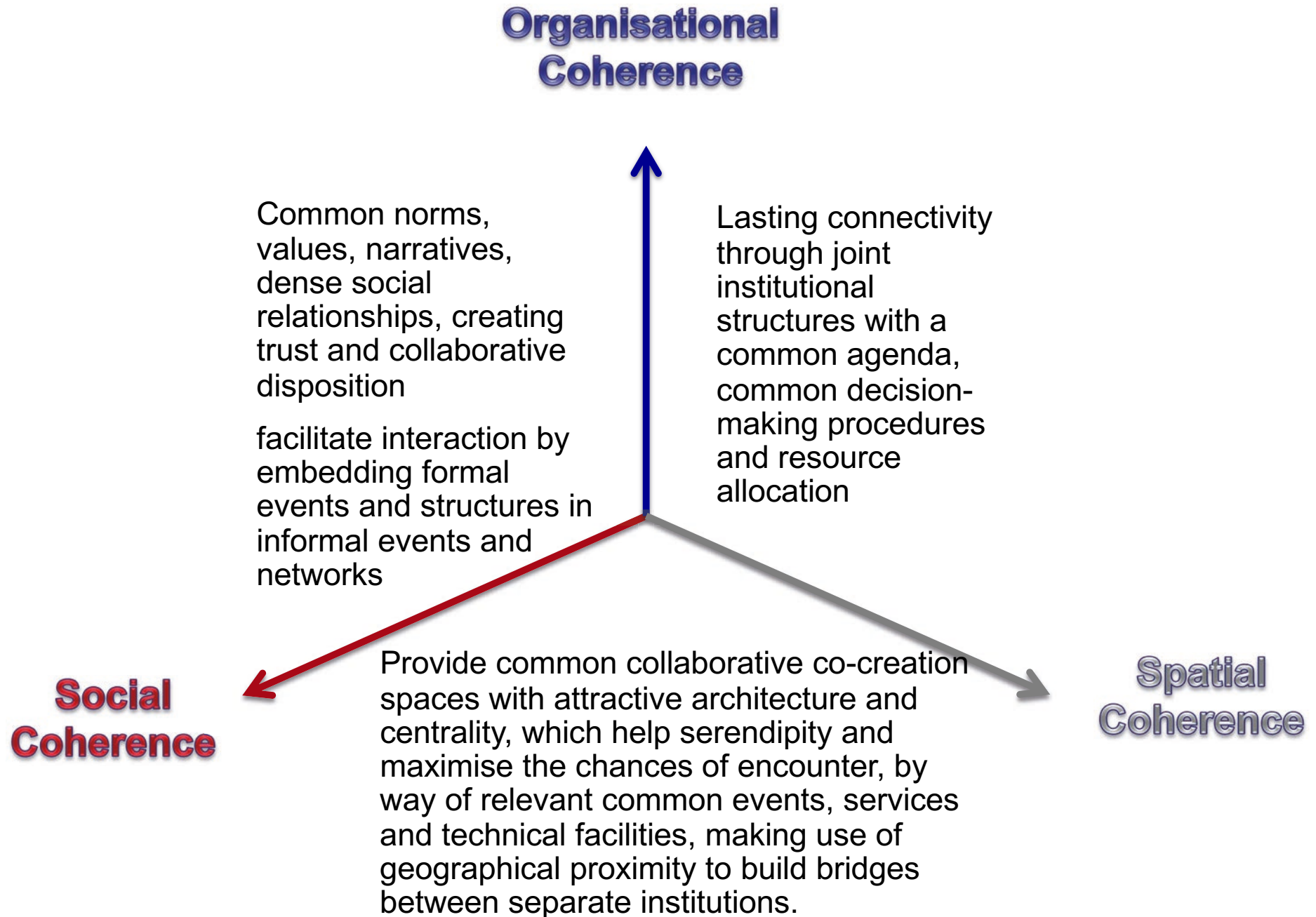


The **Cooperative Automotive Research Network**, initiated by SEAT, Volkswagen Group Research and the Universitat Politècnica de Catalunya (UPC), is an open hub for industrial and academic partners from the areas of automotive and mobility research & innovation. CARNET is located in Barcelona, and works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



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



The Challenges

The Challenge:

New Demands and Dissolving Institutional Borders

Dissolving borders

- Between disciplines
- Between institutions (different types)
- Between regions and nations
- Between different types of knowledge institutions
- Between internal and external sources of knowledge, between classical education, curiosity-driven research and responsiveness to “external” demands

Diversifying funding streams: new projects > basic maintenance of research and education

Success Factors - Challenges

- New units have to offer clear academic (& financial) added value
- Strongly dependent on the entrepreneurial spirit of the director / coordinator
- Remoteness from academic committees is opportunity and risk
- Far-reaching autonomy, operational flexibility decisive for engagement (especially of external partners)
- Financial resources, time resources, professional support services
- Reconnection to traditional organisational structures important for sustainability (recruitment, resource allocation, endangered position through change of university leadership)

Funding Sources: Dependence on external grants

Abbildung 6: Finanzierung der Organisationseinheiten in der Forschung

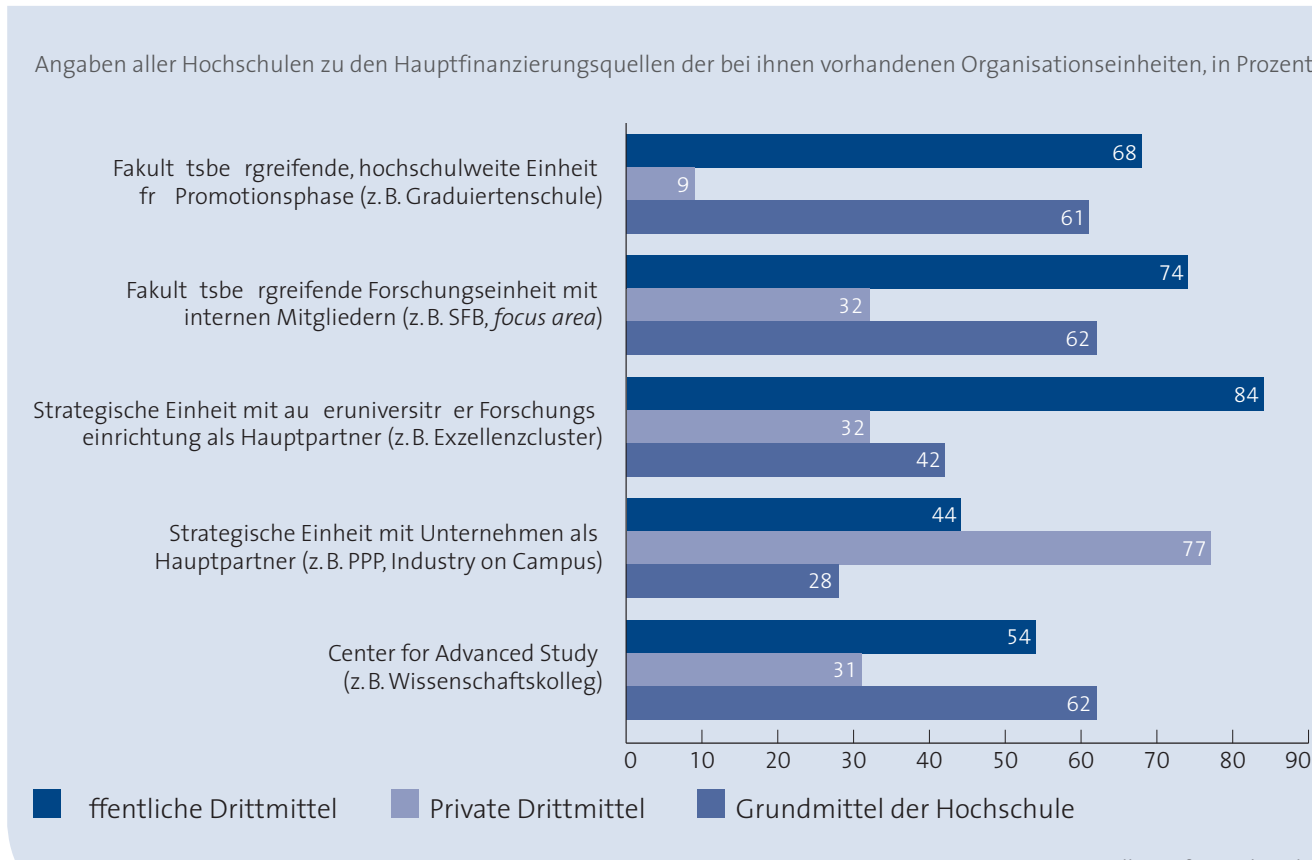
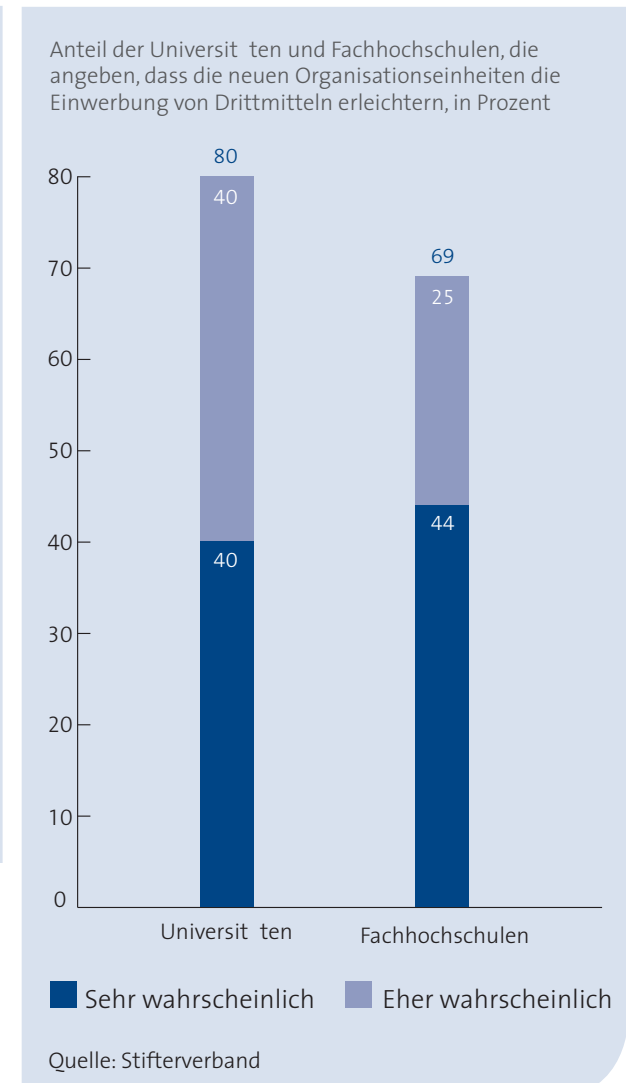
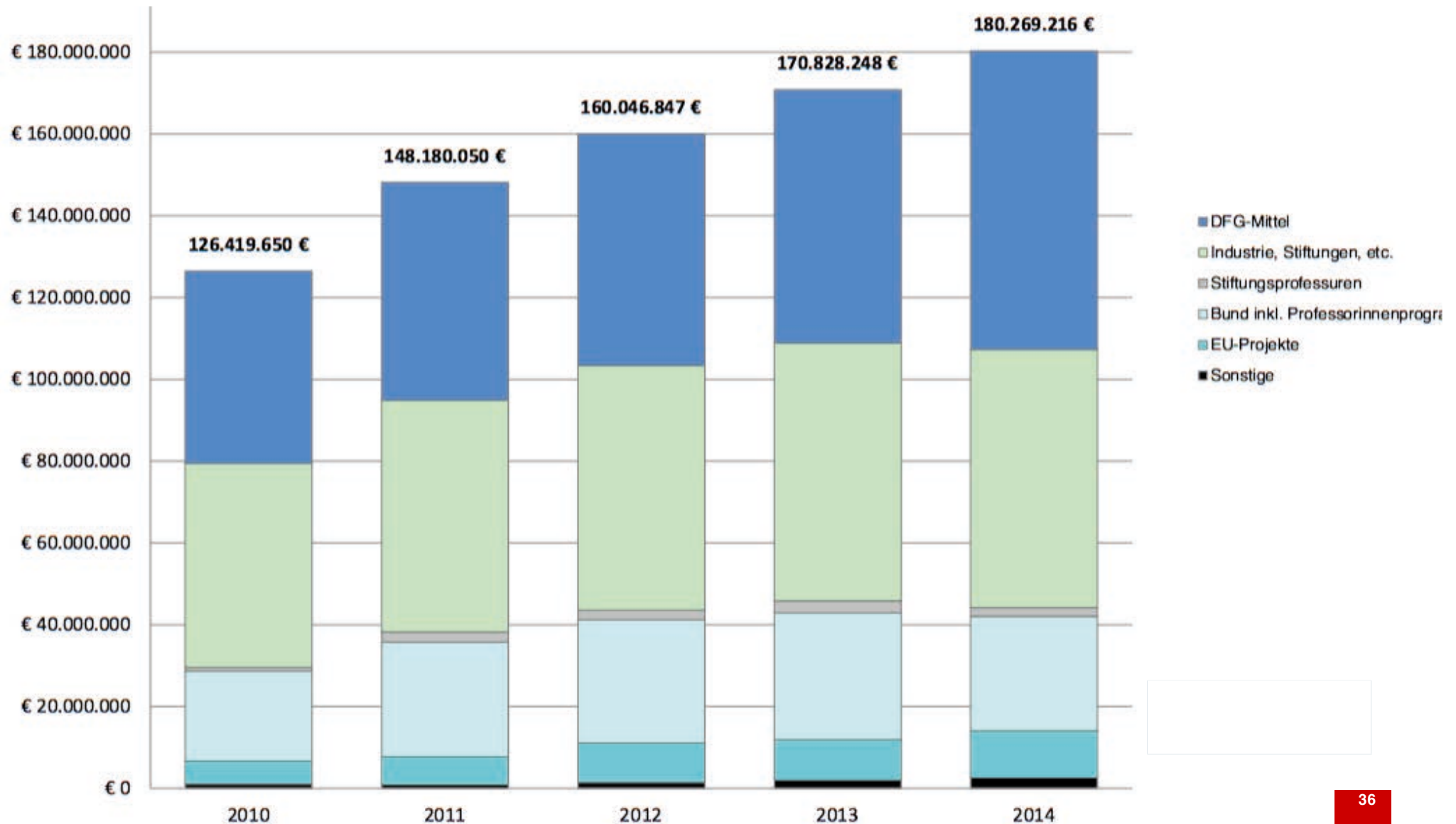


Abbildung 12: Drittmittel rücken in den Vordergrund

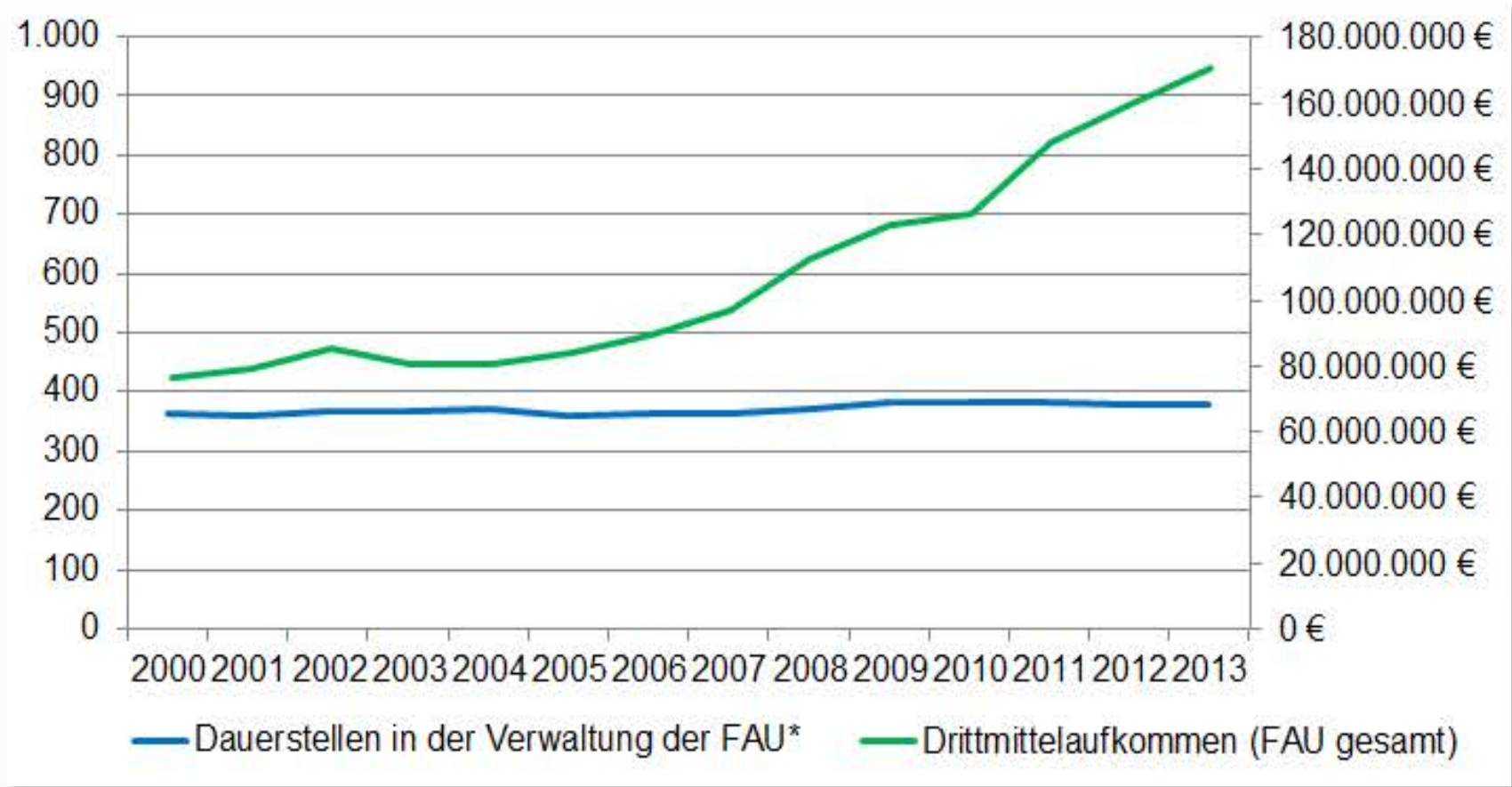


Increase of external grant income at one research university – sustainable ?



Sufficient support structures, services, infrastructures?

Entwicklung des Verwaltungspersonals relativ zum Drittmittelaufkommen



Key Challenges of HE Governance

- Matrix organisation – Clusters vs. faculties, Strategic multipliers vs. deans/ department heads – relation to disciplines (teaching, disc. standards and methods)
- Fluidity vs. cristallisation in research focus areas – differentiated funding instruments, structures
- Institutional coherence of strategic planning and hiring policy vs. external strategic opportunities
- Close cooperation with external organisations, but not as junior partners – basic funding?

Tensions between New Units and Faculties

- On the one hand, we emphasise the need for stronger deans and empowered strategically oriented faculties...
 - Decentral budget autonomy
 - Hiring policy beyond departmental perspectives
 - Hinge between institutional and subject-level decision-making
 - Forced to re-allocate resource unequally on the basis of performance, create incentive systems, performance-based funding
 - Role in quality evaluation
- On the other hand, we place the strongest strategically visible units outside of the faculties so as to benefit from more autonomy and flexibility...

Five Conclusions and Questions for Institutional Development

1. How to Support Transversal Priority Areas

- Identification of emerging thematic areas with institutional development potential: new task of central leadership
- Internal and external funding more easily mobilised for new projects; more difficult to sustain continuing excellence
- Challenge of dependence on third party funding and its emphases (limited project life span, no strategic reserves, no sustainability) incl. thematic fashions
- Resource reallocation to new units (underfunding of basic HE functions)
- Reduction of subject portfolio, more pressure to participate in thematic clusters / focus areas
- Difficult negotiations of subject emphases across faculties

2. How to bring innovative ideas from different groups into design of new innovation „spaces“, units

- Tension between academic and administrative managerial perspectives, constraints, tasks, professional values
- Academic freedom as core value for academics – naïve notion of freedom? Professional arrogance – innovation always emerging from academic environments, not/ less from other professionals
- Recognition of other aims, other success factors than just academic content (quality of services, infrastructures, responsiveness to external demands)
- Recognition of student and external demands and expectations
- Recognition of visual and communicational cultures

3. New Tensions or Synergies between Research and Teaching?

- In D: Strategy development mostly through research profile, few incentives to sharpen profile in teaching, high teaching load in international comparison; NL. Finland: innovation-driven strategies bring new strategic attention to innovative teaching environments
- Conflicts in hiring policy/ denomination of professorships
 - ⇒ Broader more disciplinary needs for teaching vs. more specialised often interdisciplinary orientation in research
 - ⇒ Reduced teaching load vs. meeting increased student numbers
- Teaching through basic funding (= under funded), research third-party funding (competition, quality judgement)
- Departments with high teaching load have fewer chances to gain third party funding
- Innovation demands bring teaching and research environments into common agenda and spaces

4. New Intra-institutional Power Structures

- New organisational units = communities of common interest
- Strengthening of academic performance and entrepreneurship
- New committees (strategy committees) and informal communication (head of OE and univ. leadership)
- Far-reaching rights / autonomy reg. personnel and funding, sometimes like faculties, better quality of service and infrastructure
- Weakening of faculties through cross-reaching focus areas
- Weakening of areas which do not form part of high profile areas (resource reallocation)

5. Increased Influence of External Partners and Strategic Alliances

- Dissolved institutional borders through close cooperation, common professorships, infrastructures, grad. programmes
- Shifting weights because of higher resource growth of research institutes (thematic leadership, hi-jacking), universities as junior partners
- Membership in strategy and hiring committees
- Increasing cooperation between universities and FH (univ. of applied sciences)
- Strong influence on priorities/ instruments of funding organisations
- Different decision-making and strategy processes

Question 1

Are we observing a transitional phase between two models of HE organisation:

- From disciplinary to thematic/ task- or problem-based
- From organisation around subject communities to organ. Around organisational tasks and aims
- From loosely coupled organisational form to “strategic empowerment”
- From expert-steering (loose coordination) to managerial
- From basic funding to aim- and project-oriented HE funding
- From disciplinary organisation to one in which themes and organisational forms which reach across faculties and are strongly influenced by external partners and social needs are gaining in importance

Question 2

Will the universities of the future will be organised and run more as a platform, „holding“ or roof organisation for many heterogeneous and largely autonomous units ?

- Under the umbrella of the whole institutions many largely independent sub-actors will be responsible for
 - steering and managing research and teaching
 - securing public and private resources.
- These sub-units will vary greatly not only in terms of content and thematic orientation but also in terms of funding, governance, partners, personnel, functions and relation to the strategic core leadership.

Question 3

Will power relations and principles of governance favour the new structures, to the detriment of faculties?

- Individual entrepreneurs and successful units gain influence with resp. to strategic development of institution.
- Faculties /departments will lose influence, only be needed for:
 - Subject socialisation
 - Scientific method development
 - Career development
- Will many largely independent sub-actors will be responsible for steering and managing research and teaching, securing public and private resources, or will institutional support gain importance?
- Internal structural diversity: New clusters / units will vary greatly not only in terms of content and thematic orientation but also in terms of funding, governance, partners, personnel, functions.

Question 4

What should innovative learning and research environments look like?

- Relation between research and teaching/ learning
- Balance between curiosity-driven and use-driven research
- Digital vs. physical presence and communication
- Relation between academic and service innovators
- Relation between internal and external partners
- Importance and resources for infrastructure