INTERNATIONAL EXAMPLES FOR TECHNOLOGY TRANSFER

RELEVANT BEST PRACTICES

Frank Graage, Ralf Lauterwasser
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Different countries: different approaches

Buttom-up

- Initiatives from the ground level
- decentralized decision-making
- driven by on-the-ground challenges
- highly adaptable to local conditions
- high stakeholder engagement suitable for grassroots innovation and community-driven projects
- risk of fragmentation

Top-down

- Initiatives directed from higher authorities
- centralized decision-making
- relies on expert-designed strategies
- less adaptable to local conditions
- faster implementation
- limited stakeholder involvement
- risk of disconnection from local realities.

BEST PRACTICE 1

Stanford University

STANFORD UNIVERSITY

INSTITUTIONALIZATION & CAPITAL – BUTTOM-UP APPROACH

The Office of Technology Licensing (OTL) at Stanford University is a vital component of the university's **innovation ecosystem**.

By managing

- **intellectual property**,
- **facilitating licensing agreements** and
- **supporting startup formation**,

the OTL helps translate groundbreaking research into practical applications that benefit society.

STANFORD UNIVERSITY

HISTORY OF 50 YEARS – THE CRADLE OF ´SILICON VALLEY´

(1) Frederick Terman - The Father of Silicon Valley

- Dean of Engineering and later Provost at Stanford (1930s-1950s)
- Encouraged students to start companies based on their research
- Notable mentees: Bill Hewlett and David Packard

(2) Stanford Research Park (1951)

- Established to foster collaboration between academia and industry
- Located across the street from main campus
- Encouraged high-tech companies to set up near Stanford
- Facilitated application of research to real-world problems

(3) The Birth of an Ecosystem1970s:

- Investors recognized potential and moved to Sand Hill Road
- Organic growth of entrepreneurial ecosystem
- Stanford at the center of this thriving environment

(4) Impact on Tech Industry

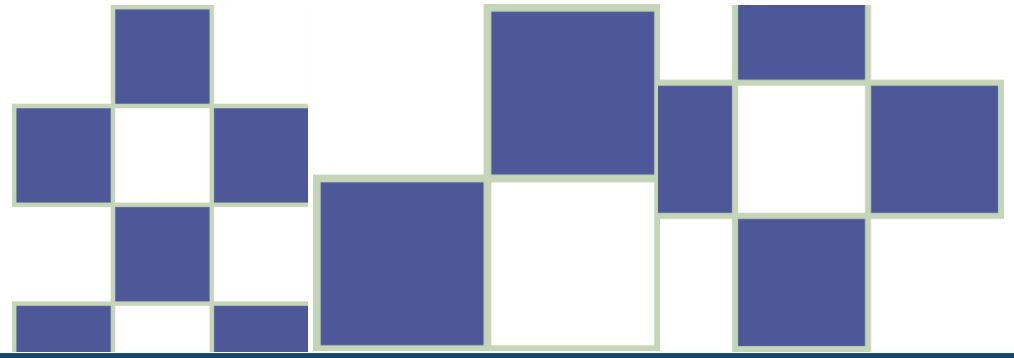
- Nurtured many successful tech companies, including Apple
- Strong alumni network contributing to ongoing innovation
- Continues to play a crucial role in Silicon Valley's success

STANFORD UNIVERSITY

ACHIEVMENTS IN 50 YEARS

- 13,699 inventions
- 4,832 issued patents
- 550 - 600 invention disclosures per year
- licensed founding technologies to over 415 Stanford startups
- $2.1bn in total licensing revenue
- 50 full-time employees

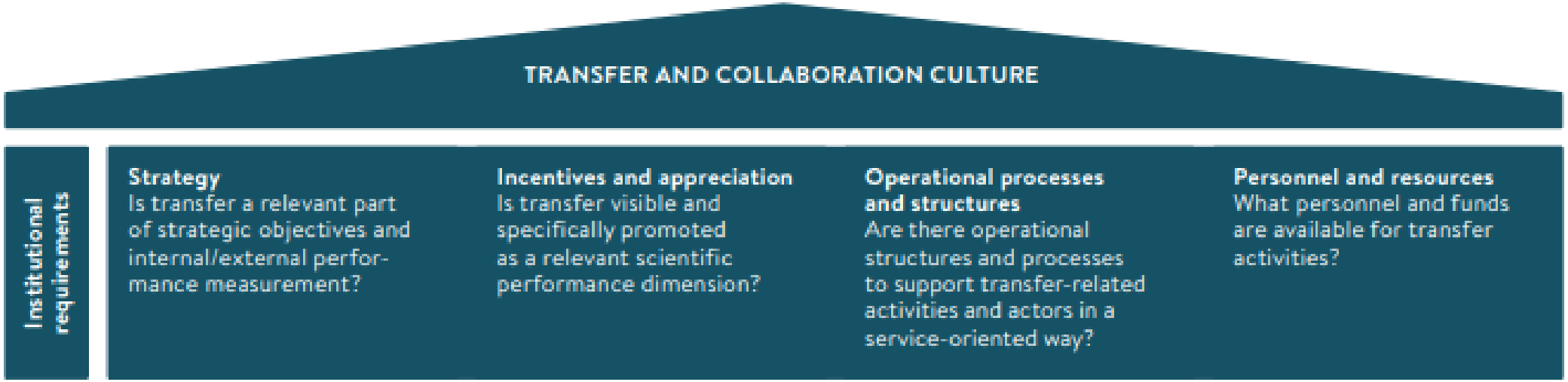
- Google
- Sun Microsystems
- Yahoo!
- Cisco Systems



STANFORD UNIVERSITY

STRATEGY: STRONG QUANTITATIVE, BUTTOM-UP APPROACH

OTL focuses on "planting as many seeds as possible" rather than trying to predict which technologies will be successful



BUT...

IT IS NOT ABOUT MONEY GENERATION

..only 575 of them generated at least $100,000 in any single year

..only 103 of them generated more than $1m in revenue in any one year

..only 3 inventions in the 50 years have hit the $100 million cumulative revenue mark

Technology transfer should NOT be an income generator to support the university financially

IMPACT FOR SOCIETY

COVID-19 CASE: BALANCING IP PROTECTION AND BROAD ACCESS TO COVID-19

(1) Prioritization of COVID-19 Research:
- Created in partnership with colleagues at Harvard and MIT.
- Tech transfer offices focused on expediting research and licensing agreements related to COVID-19.

(2) Minimization of Administrative Burdens:
- Streamlined processes to ensure quick deal execution.

(3) Rapidly Executable License:
- Non-exclusive, royalty-free license for IP rights.
- Specified period and purpose: preventing, diagnosing, and treating COVID-19.

(4) Commitment to Broad Access:
- Licensees agree to distribute resulting products to ensure broad access across all sectors of society.

(5) Impact:
- Ensures that IP does not create barriers to access while protecting commercial investments.
- Facilitates quick and efficient technology transfer to combat COVID-19.
- Requires licensees to commit to distributing resulting products as widely as possible at a low cost for broad accessibility

BEST PRACTICE 2

Denmark & Technical
University of Denmark (DTU)

DENMARK

BUTTOM-UP APPROCH WITH STRONG GOVERNMENTAL SUPPORT

Uddannelses- og Forskningsministeriet

MINISTRY IS COLLECTING YEARLY DATA FROM EACH UNIVERSITY ON TRANSFER INDICATORS AND MAKING IT PUBLICLY AVAILABLE

MINISTRY´S CONCERNS: HOW DENMARK MIGHT FOSTER A MORE **ENTREPRENEURIAL CULTURE** IN ITS KNOWLEDGE INSTITUTION?

THE QUESTION OF INCENTIVE STRUCTURES FOR RESEARCH AND TECHNOLOGY TRANSFER IS CLOSELY RELATED TO THE DEBATE OF HOW KNOWLEDGE TRANSFER ACTIVITIES CAN AND SHOULD BE ACKNOWLEDGED IN THE ACADEMIC CAREER PATH!

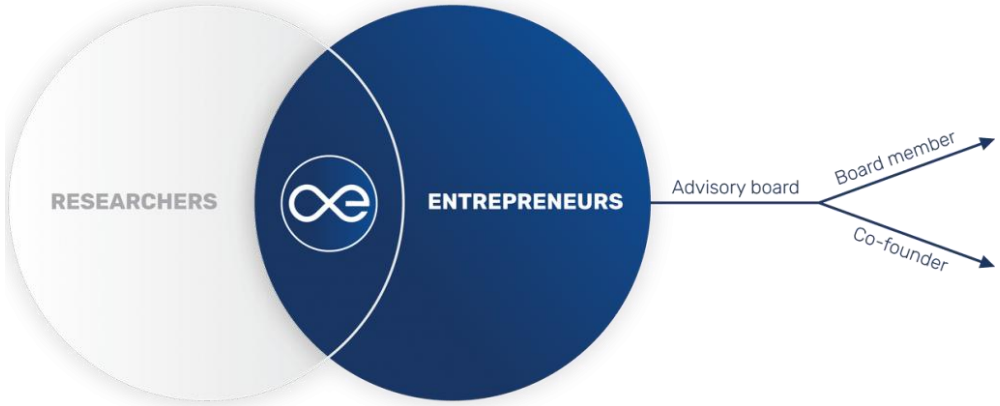
DENMARK

QUANTITATIVE INDICATORS AT GOVERNMENTAL LEVEL

224 | 76106,38263

A	B		AE	AF	AG	AH	AI	AJ	AK	AL
År	Hovedinstitution	der	10. Salgsaftaler (§ 4-selskab)	11. Optionsaftaler	12. Optionsaftaler (§ 4-selskab)	13. Spinouts	13A. Stiftet virksomheder (§ 14, stk. 1.)	13B. Stiftet virksomheder (§ 12, stk. 2)	14. Erhvervet ejerandele	15. Bruttoindtægter fra kommercialisering (1000 kr.)
2021	Københavns Universitet	0	0	7	0	5	5	0	0	28774,0
2021	Roskilde Universitet	0	0	0	0	1	0	0	0	0,0
2021	Syddansk Universitet	0	0	1	0	3	3	0	0	1367,2
2021	Aalborg Universitet	0	0	4	0	2	2	0	0	5055,9
2021	Aarhus Universitet	0	0	5	0	2	2	0	0	4178,7
2021	Region Hovedstaden	0	0	2	0	1	1	0	0	3428,8
2021	Region Midtjylland	0	0	1	0	0	0	0	0	120,1
2021	Region Nordjylland	0	0	0	0	0	0	0	0	587,5
2021	Region Sjælland	0	0	0	0	0	0	0	0	0,0
2021	Region Syddanmark	0	0	0	0	0	0	0	0	0,0
2022	Copenhagen Business School	0	0	0	0	0	0	0	0	0,0
2022	Danmarks Tekniske Universitet	2	0	5	0	8	8	0	2	34546,0
2022	IT-Universitetet	0	0	0	0	1	0	1	1	0,0
2022	Københavns Universitet	0	0	10	0	7	7	0	0	13878,4
2022	Roskilde Universitet	0	0	0	0	1	0	0	0	0,0
2022	Syddansk Universitet	0	0	2	0	2	2	0	0	1679,8
2022	Aalborg Universitet	0	0	4	0	2	2	0	0	3939,7
2022	Aarhus Universitet	0	0	4	0	3	3	0	0	6421,1
2022	Region Hovedstaden	0	0	0	0	3	3	0	0	16555,8
2022	Region Midtjylland	0	0	1	0	0	0	0	0	60,9
2022	Region Nordjylland	0	0	0	0	0	0	0	1	2206,3
2022	Region Sjælland	0	0	0	0	0	0	0	0	0,0
2022	Region Syddanmark	0	0	1	0	1	1	0	0	241,9
2023	Copenhagen Business School	0	0	0	0	0	0	0	0	0,0
2023	Danmarks Tekniske Universitet	1	0	5	0	7	7	0	0	76106,4
2023	IT-Universitetet	0	1	0	0	0	0	0	0	0,0
2023	Københavns Universitet	0	0	4	0	2	2	0	0	15961,6
2023	Roskilde Universitet	0	0	0	0	0	0	0	0	0,0
2023	Syddansk Universitet	0	0	3	0	1	1	0	0	2252,1
2023	Aalborg Universitet	0	0	5	0	7	7	0	0	5444,0
2023	Aarhus Universitet	0	0	1	0	3	3	0	1	5844,3
2023	Region Hovedstaden	0	0	0	0	2	1	1	0	2143,8
2023	Region Midtjylland	0	0	0	0	1	1	0	0	2,2
2023	Region Nordjylland	0	0	0	0	0	0	0	0	41,7
2023	Region Sjælland	0	0	1		1	0	1	0	3691,9
2023	Region Syddanmark	0	0	0	0	0	0	0	0	375,2

BUTTOM-UP INITIATIVES THAT THE MINISTRY SUPPORTS AND FINANCES



Open Entrepreneurship

facilitate the meeting between researchers from Danish universities and external experienced entrepreneurs and intrapreneurs and the journey from idea to start-up.

Network and clusters

As a participant in one of DTU's networks, your company gets access to the latest research-based knowledge in an easy and non-binding way

SPARK Denmark

Mentoring program that supports academic inventions in life science (from Ph.D. students to experienced professor) with tailored mentorship from industry experts, education within innovation, and financial support.

THE TECHNICAL UNIVERSITY OF DENMARK (DTU)

STRONG INVOLVEMENT OF LOCAL INDUSTRY

- DTU has one of the most well-developed **ecosystems for innovation and entrepreneurship** among technical universities in Europe.
- DTU has established a comprehensive framework for technology transfer, supporting **innovation**, **entrepreneurship**, and **industry collaboration**.
- **Support infrastructure**: Technology Transfer Office, innovation hubs, innovation scouts, entrepreneurial education for engineers, startup incubators and support programs, national programs for university-industry interaction.

DTU IN NUMBERS

PROJECTS

1.173

projects in collaboration with companies in 2021.

START-UPS

74

new start-ups in 2021.

INVENTIONS

81

inventions commercialized in 2021.

DTU STARTUP INCUBATOR - SKYLAB

STRUCTURED SUPPORT FOR STARTUPS & INVOLVEMENT OF INDUSTRY = LOCAL ECOSYSTEM

- Lab work
- Prototyping
- Coaching
- Courses
- Meetings
- Counseling
- Advice
- Workshops
- Hackathons
- Lectures….

2023 in numbers

COMMUNITY ENGAGEMENT

8.655 night owls from 10pm-6am

184.214 visitors

97 delegations

114 events

we reached 25k followers

STARTUP SUPPORT

33% female researchers/ students in startup programs

81 brand-new startups

360 startup teams supported

160 unique teams in startup programmes

ACADEMIA

2.123 students
1.871 lecture hours
23 courses from
7 departments

COMPANY COLLABORATION

47 companies/ organizations in larger collaborations

LABS & WORKSHOPS

314 prototypes

9.877 registered
1.210 unique users *from*
70 study lines

DTU: INNOVATION IS OUR DNA

INNOVATION AT DTU COMPRISES 4 PILLARS

Students Innovation	Business Collaboration	Start-up Incubation	Commercialization
Student innovation at DTU is much more than start-ups: Through projects, events, internships, and student jobs, students gain experience and contacts within the business community. Innovation is standard in the curriculum of all our engineering programmes.	A wide range of collaborations with companies regarding strategic research collaborations, continuing education, student projects, conferences, etc.	The growth of startu-ups is supported by DTU's establishment of prototype workshops, scientific advice, funding opportunities, and research environments—together providing a unique environment centred on entrepreneurship.	Intellectual property rights (IPR) are a central part of the University's business and underlines the relevance of the research community. In this context, DTU enters into sales, license and option agreements with established companies and start-ups that can develop products based on technology from DTU.

BEST PRACTICE 3

Germany & Steinbeis

TECHNOLOGY TRANSFER IN GERMANY

MAINLY TOP-DOWN APPROACH

Bundesministerium für Bildung und Forschung

1) Overview

- Highly differentiated system with multiple stakeholders
- Universities and non-university research institutions play key roles
- Strong focus on translating expertise into economic and social innovations

2) Key Players

- Universities (approx. 400)
- Non-university research clusters: Helmholtz Association, Max Planck Society, Leibniz Association..
- Fraunhofer-Association (70 institutes)
- Steinbeis

NEW APPROACH TO TECHNOLOGY TRANSFER

DATI – GERMAN AGENCY FOR TRANSFER AND INNOVATION

- New **federal agency at Ministry level** launching in early 2025
- Decentralized approach
- Annual budget of €50 million (expected)
- Broad target group: universities, universities of applied sciences, non-university research institutions
- New, flexible funding formats
- Autonomy in program design
- Focus on digital innovation transfer

PARTICIPATION PROCESS FOR THE FOUNDING OF DATI

2022 July

Stakeholder dialogues
50 representatives from universities, companies and foundations, non-university and industrial research institutions and regional development. The dialogues built on the results of a preparatory online consultation.

2022 Nov

Online survey

The online survey sharpened and deepened a large number of specific questions about the agency's concrete concept.

2023 Feb

Thematically orientated workshops

Based on the results of the online survey, 4 thematically orientated workshops were held with a further total of around 50 stakeholders to discuss possible solutions to opposing viewpoints on the topics of tasks and structures, players and roles.

2024 July

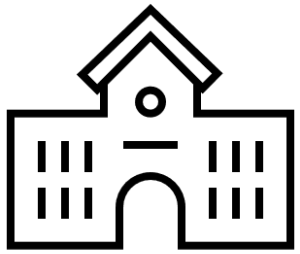
Results of the multi-stage stakeholder involvement
&
Submition of recommendation paper 'Transfer Excellence as a Mission' to the Ministry for the establishment and expansion of DATI.

2025

STEINBEIS‘ APPROACH

SMALL STEPS TO SUPPORT INNOVATORS

University

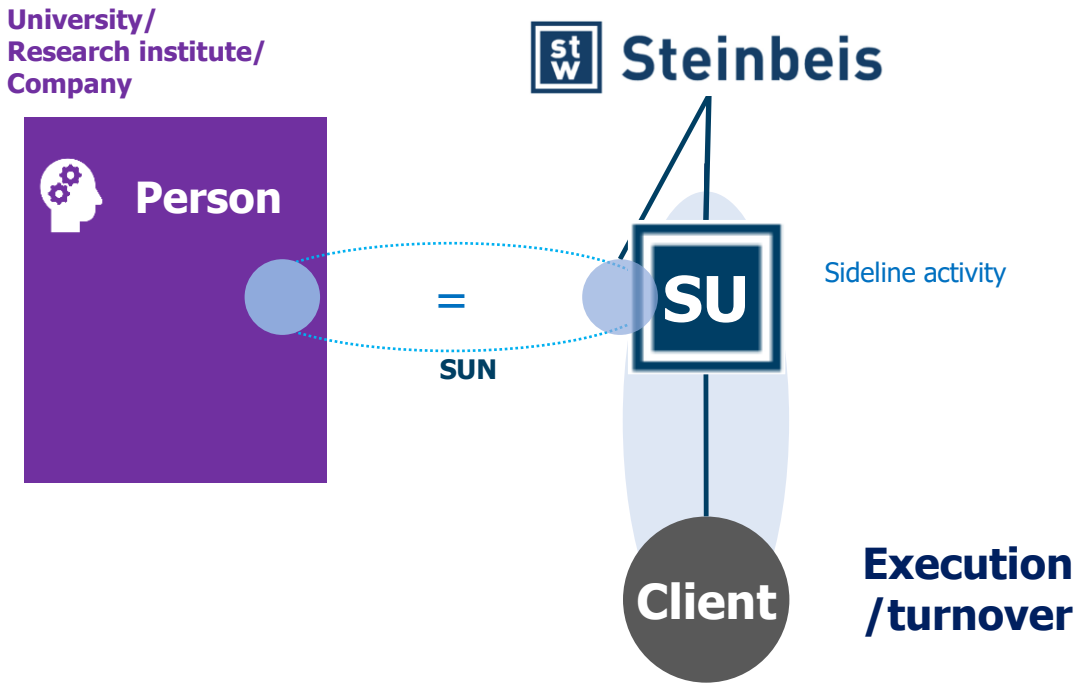


Individual researcher/
Innovator

Steinbeis
Transfer
Support

Video: technology transfer with steinbeis

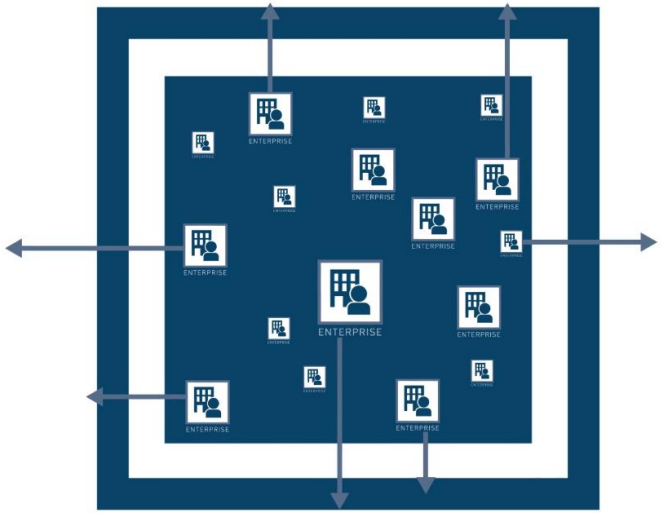
ORGANISATION STEINBEIS-ENTERPRISES



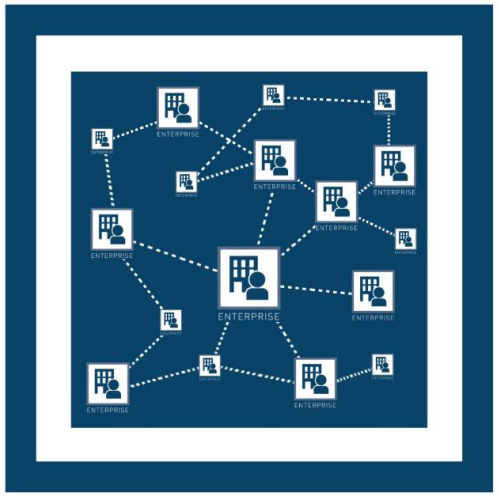
SU: Steinbeis-Enterprise
SUN: Steinbeis-Entrepreneur (responsibile for SU based on SUN-contract)

- SUN as „(Academic) Entrepreneur"
- Third-party funding in main-activity!
- Synergy Third-party funding/turnover!

CHARACTERISTICS OF THE PLATFORM

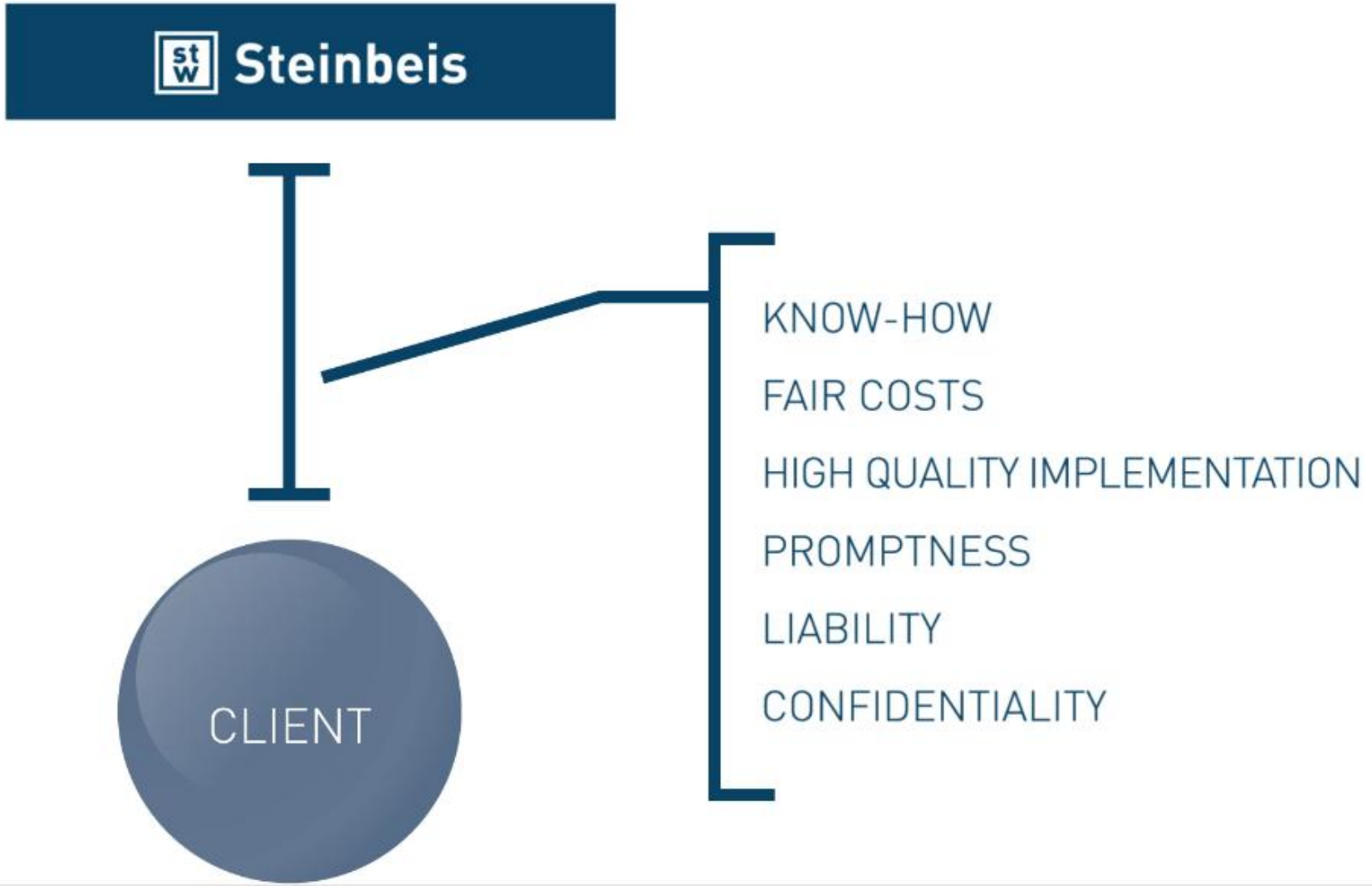


- Professional legal and operational setting under an umbrella company
- Space of trust – freedom to operate
- Act independently on the market



- Back-office services
  - Legal
  - Bookkeeping
  - HR
  - Insurance
  - Branding/Marketing

CHARACTERISTICS FOR THE CLIENT



EXAMPLE STEINBEIS ENTERPRISE RUN BY YOUNG RESEARCHERS

Steinbeis Transfer Center Polymer and metal-based lightweight design

Services

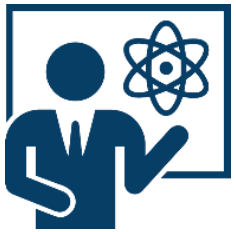
- Consulting and training on processing and manufacturing processes
- Engineering, simulation, and production concepts for lightweight construction systems
- Layout strategies for manufacturing processes and joining technology
- Prototype solutions for lightweight construction concepts
- Coordination of market research projects

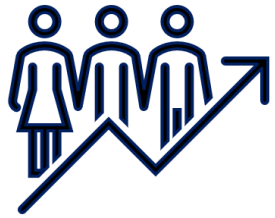
Key Areas

- Lightweight construction methods with integrated functions
- Feasibility studies on the optimization of load and structures
- Manufacturing processes for plastics and metals
- Material properties of plastics and metals

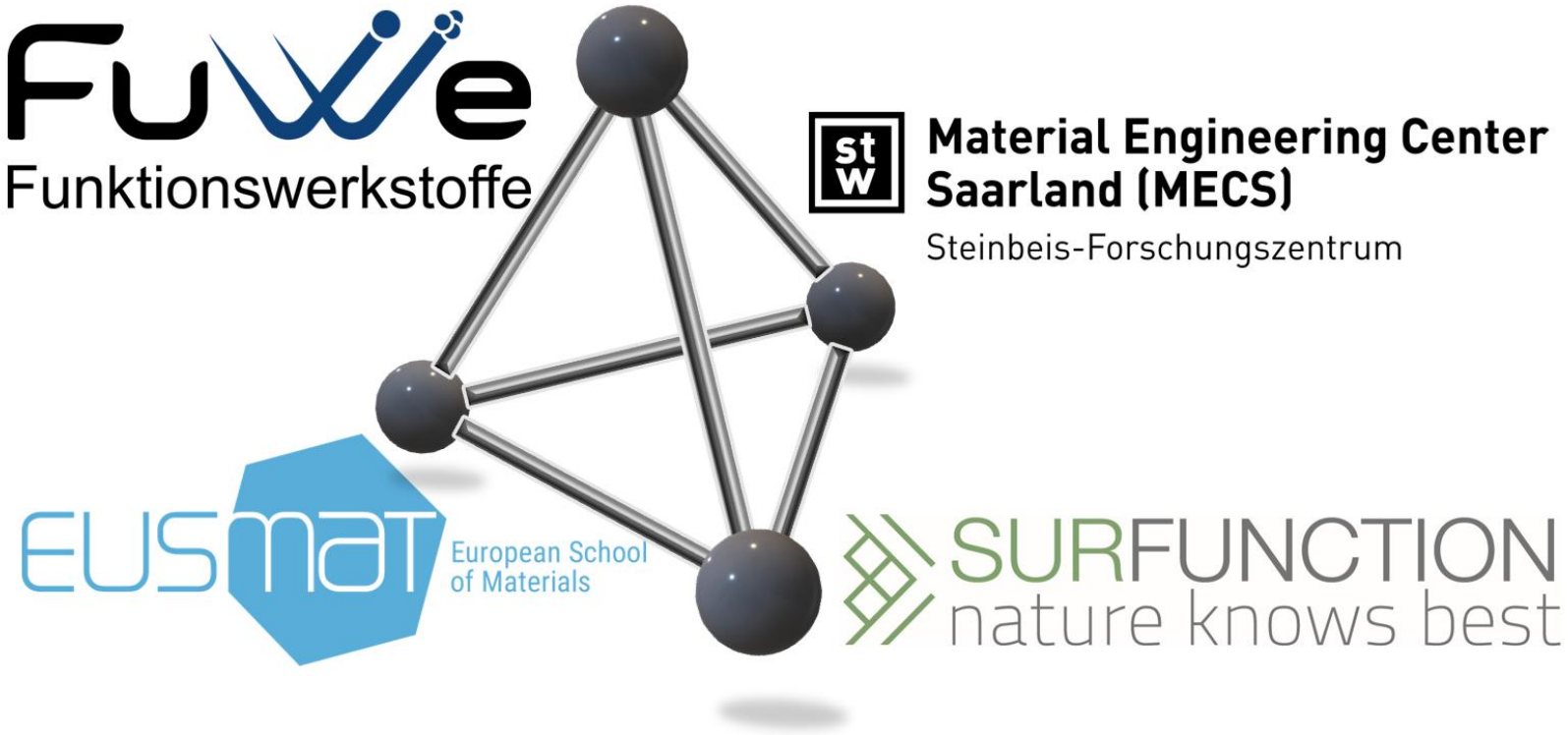
COOPERATION WITH UNIVERSITIES

- Common interest in supporting transfer activities
- Access to the right instruments especially for small-scale projects and specific industry demand
- Broaden the use of existing reserach infrastructures such as labs or machinery
- Increasing the innovation and impact footprint of those facilities
- Close a cooperation agreement or start a joint transfer organsiation





EXAMPLES OF A FRUITFUL COOPERATION



© FuWe

- Chair of Functional Materials at Saarland University
- Steinbeis Research Center MECS (Material Engineering Center Saarland)
- Student laboratory (SAM)
- Spin off SURFUNCTION
- European School for Materials Research (EUSMAT)

KEY FACTORS FOR SUCCESS IN TECHNOLOGY TRANSFER:

Industry Collaboration: Building strong relationships with industry can facilitate the commercialization of research.

Entrepreneurial Ecosystem: Supporting startups and providing resources for entrepreneurs can help translate research into marketable products.

Government and Policy Support: Favorable policies and funding can accelerate the transfer of technology from labs to the market.

Strong Intellectual Property (IP) Management: Protecting and managing IP is crucial for attracting industry partners and investors.

Interdisciplinary Research: Combining expertise from different fields can lead to innovative solutions.

CHALLENGES AND CONSIDERATIONS

STRATEGIC DECISIONS

1. **Balancing Academic and Commercial Interests**:

   The OTL must navigate the delicate balance between academic freedom and the commercial potential of research. Ensuring that research remains open and accessible while also protecting IP can be challenging.

2. **Resource Allocation**:

   Deciding which inventions to pursue for commercialization requires careful evaluation of market potential, technical feasibility, and resource availability.

3. **Ethical Considerations**:

   Ensuring that technology transfer activities are conducted ethically and transparently is a priority. This includes managing conflicts of interest and ensuring that the benefits of commercialization are shared equitably.

Merci beaucoup de votre attention

frank.graage@steinbeis.de

ralf.lauterwasser@steinbeis.de

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