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Open Innovation and Research Cooperations in the EU

Prof. Dr. Arno Basedow
Senior Strategy Advisor

Innovative Transfer Systems
Fraunhofer Center for Central and Eastern Europe MOEZ

Leipzig, Germany

This Presentation Concerns

- **The increasing interest in effective knowledge sharing through open innovation**
- **The logics, prerequisites, and principles concerning open innovation**
- **Creation of a friendly ecosystem for cooperations**
- **Responsible partnering between research and business organisations**
- **Guidelines for joining forces in a world of open innovation**
- **The opportunities and benefits that result from handling these tasks properly**

Open Innovation and Research Cooperations in the EU

Outline

1. Knowledge sharing in the European Research Area (ERA)
2. Building successful partnerships
3. Open innovation – a new paradigm
4. Reviewing the concept
5. Historical outline of open innovation
6. Logics of open innovation
7. Characteristics of open innovation

8. Open innovation readiness
9. Prerequisites for efficient open innovation
10. Principles underpinning open innovation
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1. Knowledge Sharing in the European Research Area

- The Foundations of (Open) Innovation in the EU -

Background / Green paper (COM(2007)161; 04.04.2007)

- Concept of the ERA
- Embracing open innovation

IP-Charter for the management of intellectual property (April 2007)

- Basic principles
- Implementation of the basic principles; framework programmes

Report of the ERA expert group EG 4 (EUR 23323 EN; 2008)

- Policy options; legislation; EU-Patent; funding instruments; priorities
- European code of practice on knowledge sharing; specific R&D related issues

University business dialogue (COM(2009)158; 02.04.2009)

- University-business cooperation; suggested changes
- The policy environment

Europe 2020 flagship initiative / innovation union (Com(2010)546; 06.10.2010)

- European innovation partnerships
- Comparable conditions for R&D programmes across Europe

2. Building Successful Partnerships 1

- Working Together -

1. Industry and research institutions

- Creating the **conditions** for successful knowledge transfer
- Promoting an **entrepreneurial mind-set**
- **Single European ownership model** for publicly funded research
- **Appraisal criteria** for all activities and for the collaboration with industry

2. Member States and the Community

- The European Institute of Innovation and Technology (**EIT**)
- Support Member States and develop **trans-national measures**
- **Benchmarking** of innovation related activities
- Financial **support**, State aid
- **EU cohesion policy**
- **Framework programmes** for R&D and competitiveness & innovation

To be successful, collaboration must be treated strategically

Scientific discovery and commercialisation must be complementary

2. Building Successful Partnerships 2

- Effective Utilisation of the Research Potential -

3. Basic principles

- **Joining forces** in a world of open innovation
- Research collaboration and knowledge transfer as a **source of innovation**
- Changing patterns and changing **obligations**
- Improved management of **research collaboration** between academia and industry
- Role of **Governments**; State aid; legal aspects of collaboration

4. Voluntary guidelines for

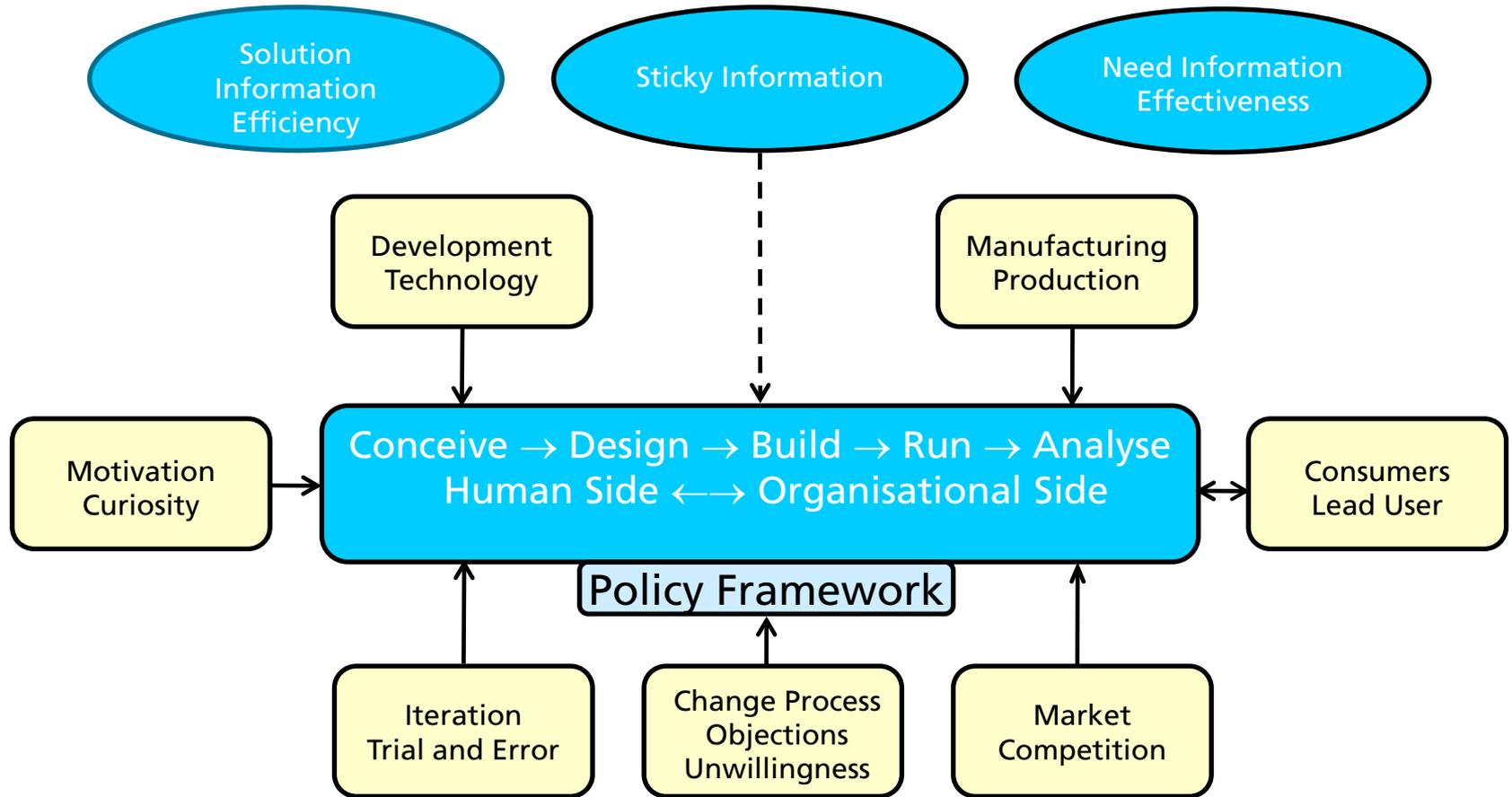
- Finding adequate **partners**
- Treating collaboration **strategically**; contracts for research collaborations
- Implementation **guidelines** for industry universities and public research institutions
- Framework requirements for **added value** through **knowledge transfer** (Government rules)

5. Management of IP in knowledge transfer activities

- The human aspects of **effective collaboration**
- Principles for an internal **intellectual property** policy (development of IP-policy)
- Principles for a **knowledge transfer** policy
- Principles **regarding** collaborative and contract **research**

3. Open Innovation

- A New Paradigm -



4. Reviewing the Concept 1

1. Innovation is a new way of doing something

„Innovation is the ability to take new ideas and translate them into commercial outcomes by using new processes, products or services in a way that is better and faster than the competition“

2. The closed innovation system („tight boundaries“)

- Innovation requires control
- Companies act as self-sufficient „castles“

Typical pathway:



3. Joy's law (Sun Microsystems)

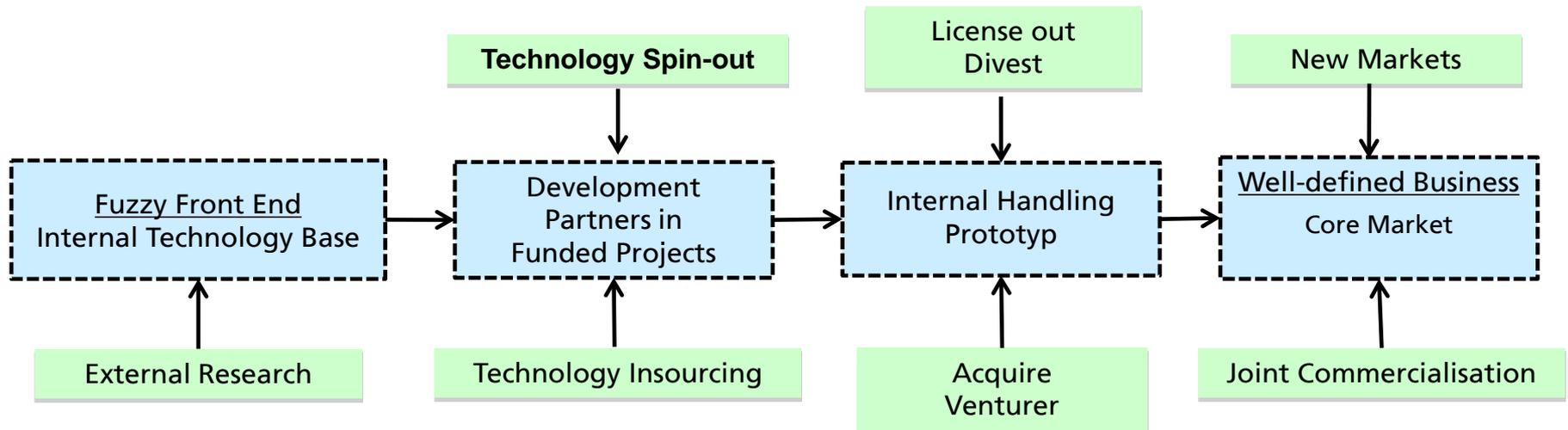
„No matter who you are, most of the smartest people work for someone else“

4. Reviewing the Concept 2

4. The open innovation approach („porous innovation tunnel“)

- Boundaries between a company and its environment are permeable
- Companies act as visitors on „bazaars“
- Partners are linked: outside-in process, inside-out process, coupled process

Typical pathway:



4. Reviewing the Concept 3

5. Chesbrough's definition (2003)

„Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively“

„Open innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology“

6. Kept simple

„Open Innovation is the new imperative for creating and profiting from technology“

4. Reviewing the Concept 4

- Contrasting Principles of Closed and Open Innovation -

Closed Innovation

- The smart people in our field work **for us**
- If **we discover**, we will be on the market first
- For maximum profit from R&D, **we ourselves** must discover, develop and market
- If **we create** many and very good ideas, we will win
- If we get an **innovation** to market first, we will win
- We should **keep our IP** in-house

Open Innovation

- We need to work with smart people **inside and outside** our company
- We **do not need to create** research results to profit from them
- **External R&D** can create significant additional value
- If we **make the best use** of own and external ideas, we will win
- Developing better **business models** is better than getting to market first
- We should **share IP** with others whenever it promotes our own business model

5. Historical Outline of Open Innovation

- **Nelson (1959):** - *Spillovers of basic research*
- **Chandler (1962):** - *Four phases in the evolution of large industrial enterprises: (single product --> vertical/horizontal expansion --> strategy of diversification --> multidivisional structure)*
- **Kuhn (1962):** - *Anomalies in industrial innovations*
- **Nelson/Winter (1982):** - *Firms search new technologies outside their own organisation*
- **Allen (1983):** - *Collective inventions, e. g. blast furnaces (1850), flat screens (1969-1989), Homebrew Computer Club (1975-1986)*
- **Hippel (1988):** - *Four external sources of useful knowledge: (suppliers/customers, universities/government, competitors, other nations)*
- **Cohen/Levinthal (1990):** - *Two faces of R&D (inside and outside the firm)*
- **Embedded Linux (1995):** - *Open source software for embedded systems*
- **Rozenbloom/Spencer (1996):** - *Troubles in leading industrial labs*
- **Wales (2000-2003):** - *Wikipedia*
- **Chesbrough (2001-2006):** - *Comprehensive open innovation concept*

6. Logics of Open Innovation

- Companies are seeking to **obtain knowledge** more quickly
- Building a **better business model** is more important than getting to market first
- It is **not necessary to generate** and own research result in order to profit from them
- Research and technology organisations are becoming more **market-oriented**
- The pathways of research results to market should **not be restricted by internal** processes of the organisation
- We all must **collaborate and compete** for the advancement of technology
- **Researchers** must act as knowledge **generators** and as knowledge **brokers**
- Not all of the smart people work for us, however, we must have **enough smart people** to identify and recognize excellent R&D

7. Characteristics of Open Innovation

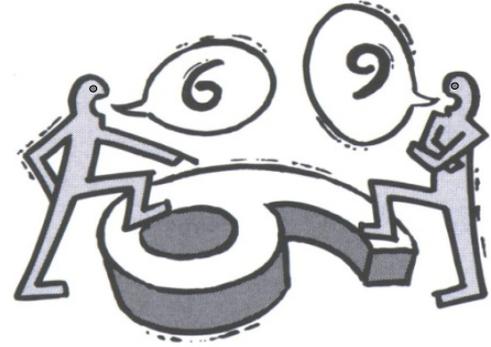
- Value is created by **correlating** „need information“ with „solution information“
- Open innovation **strives for obtaining** more effective „need information“ and more efficient „solution information“ for the development process-chain
- **„Need information“** is provided by: lead user, market surveys, trend analysis, user/expert/consumer communities
- **„Solution information“** is provided by: lead expert, technical database search, iterative processes, toolkits, communities of development, expert groups, launching consumers, integration of experts
- **Interactive relationships** within wide (possibly all) horizontal and vertical networks are essential
- **Fuzzy input and output** within the development process-chain (from the idea to the market) is necessary
- Evaluation and exploitation of **„sticky information“** is done extensively

8. Open Innovation Readiness 1

- Explorative and Exploitive Approach -

8.1. The human side („Creativity“)

- Motivation and incentives
- Leadership and culture
- Teamwork and tools
- Communication and responsibility
- Managing the interfaces (e.g. R&D; internal/external contacts)
- IP-Management (e.g. patenting; selective revealing)



8.2. The organisational side („Complexity“)

- Structures (functional, divisional, standardised processes)
- Capabilities and capacities
- Extent of cooperation
- Collaborative programmes (e.g. doctoral)
- Industrial dynamics and manufacturing
- Change management (CEO-commitment: I know, I can, I will)

8. Open Innovation Readiness 2

- Some Lessons -

8.3. The university perspective

- Academic people **tend to abandon** the work if the application process is delayed
- For academic staff it is **difficult to focus** on a purely pragmatic outcome
- Academic people **underestimate** decisions made during negotiations
- For academic staff the **cooperation** with SMEs is often **cumbersome**
- Academic people **do not have skills** to recognise the first indications of clients' **dissatisfaction**

8.4. The company perspective

- Companies are **not used** to following **pedantic requirements**
- Companies often **do not know** what they need in the **future**
- SMEs want to **use money** available, not thinking about their future innovation needs
- SMEs **need time** for market research and for preparing reports and scorecards
- The myth of EU **bureaucracy is stronger** than the announcements on the quick and easy processes (e. g. the application for vouchers)

8. Open Innovation Readiness 3

- Systems for Communication and Incentives -

	Communication	Incentives
Methods	<ul style="list-style-type: none">• Fixation of competences• Definition of the processes for external search• Definition of the processes for internal knowledge transfer	<ul style="list-style-type: none">• Specification of the individual goals• Integration of the external knowledge search within the system of the objectives / incentives• Delegation of decisions
Culture	<ul style="list-style-type: none">• Agreement on transparency of company activities• Fixation of positive understanding for discussions and cooperation• Assessment of common cross-divisional conceptions about values and goals	<ul style="list-style-type: none">• Implementation of a clear collaborative culture• Agreement on acceptance of failure• Generation of a positive attitude towards external factors and developments

8. Open Innovation Readiness 4

- Ways of Knowledge Sharing -

Action Media	Broad- casting	Net- working	Moni- toring	Evalua- tion	Partner matching	Collabo- ration	Men- toring	Nego- tiation
Publication	X							
Conferences		X			X	X		X
Face to face				X		X	X	X
Mailing Email	X			X		X	X	
Websites	X		X			X		
Network tools		X			X	X	X	
Search tools				X	X	X	X	
Memberships		X			X	X		
Portals	X	X	X	X	X			
Community	X	X			X			

9. Prerequisites for Efficient Open Innovation

- Knowledge acquisition
 - Knowledge management
 - Knowledge integration
- Ability to **understand** entrepreneurial processes and innovation problems
 - Ability to **clusters** ideas by correlated content
 - Ability to **translate** these processes and problems into a clearly-structured project
 - Capabilities for **interactive** communication and networking
 - Ability to **benchmark** and to identify those who can best provide these requirement
 - Ability to **define** the capabilities, skills, knowledge and resources necessary for solving the problem
 - Capabilities to **establish** the necessary relationships and organisational measures

10. Principles Underpinning Open Innovation

- The Cornerstones -

- Open innovation requires a **balance of interest** between partners
- Each partner must **understand and respect** what is important to others as well as to themselves
- Partners must be willing to take steps to provide for **equitable compensation** and to eliminate problems of IP-Management and ownership of results
- IP (proprietary and external) must be **appropriately managed** in order to enable the management of research
- Open innovation requires global interaction throughout the **overall value chain** (universities, research institutes, financing, large enterprises, SMEs, suppliers, customers, competitors)

The compliance with these principles establishes the basis for successful open innovation

11. Policies for Open Innovation 1

- Framework for Policy Guidelines - (VISION ERA-NET, 2008)

1. Research and technology development policy

- Financial incentives
- High-quality IP systems
- Compatibility standards

2. Interaction policy

- Development of skills
- Stimulation of interaction
- Enhancement of technology markets
- Use of go-betweens („intermediaries“)
- Back up clusters

3. Entrepreneurship policy

- Support of corporate entrepreneurship
- Access to finance
- Back up challengers

11. Policies for Open Innovation 2

- Framework for Policy Guidelines - (VISION ERA-NET, 2008)

4. Science policy

- **Appropriate funding**
- **Balanced incentives**
- **Focus on excellence**
- **Organised diffusion**

5. Education policy

- **General stimulation**
- **Entrepreneurship education**

6. Labour market policy

- **Aim for flexibility**
- **Enable knowledge migration**

7. Competition policy

- **Stimulation of competition**
- **Cartel legislation**

12. Propagating Open Innovation in the EU

- A broad-based innovation strategy for the EU: COM (2006)502; 13.09.2006
- Improving knowledge transfer between research institutions and industry across Europe: Embracing open innovation: COM (2007)182; 04.04.2007
- Voluntary guidelines for universities and other research institutions to improve their links with industry across Europe: SEC (2007)449
- Knowledge sharing in the European research area: Report of the ERA expert group EG4 (2008)
- Opening to the world: International cooperation in science and technology: Report of the ERA expert group EG6 (2008)
- Responsible partnering: Joining forces in a world of open innovations: Guidelines (2009, first issued 2005)
- University-industry partnerships for enhancing knowledge exchange: Collaborative doctoral education (EUA 2009)
- A new partnership for the modernisation of universities: University-business dialogue: SEC(2009)425; 02.04.2009

13. University Business Dialogue 1

- Bridge Innovative Solutions -

University-business cooperation

- The **main stakeholders** (national/regional government, business associations, trade unions, university associations)
- The **changing role of universities** in the economy (contribute to the economic welfare, respond to academic competition and to globalisation of education)
- More innovation, higher level of **skills in business** at universities
- **New entrepreneurs**, new business start-ups (correlation between entrepreneurship and economic growth promoting self-employment)
- Enhancing the **overall employability** of students (more transversal skills)

Policy Environment

- **Lifelong learning** programme (2007-2013); EU seventh **framework programme**
- **Competitiveness and innovation**, economic and social **cohesion programmes**
- **Laws supporting** university-business cooperation (reforms, more autonomy)
- Curriculum development (role of enterprises, **joint courses** universities/facilities, accreditation)
- **Entrepreneurship** (embedding in the curricula, industrial professors)
- **Knowledge transfer** (incentives for researches, coherent support structure, mobility)

13. University Business Dialogue 2

- Suggested Changes -

- Break down the **barriers** around universities
- Ensure real **autonomy and accountability** for universities
- Provide incentives for **structured partnerships** with business
- Provide the **right mix of skills** and competences for the labour market
- Enhance **inter-disciplinarity** and trans-disciplinarity
- Activate knowledge **through interaction** with society
- Make **funding more effective** in education and research
- Make the **ERA more visible** and attractive in the world
- Reward **excellence** at the highest level
- Engage in a regular and **sustainable dialogue** of mutual learning

14. Responsible Partnering in University Technology Transfer and Technology Transfer Offices 1

- Interaction of Science and Economy -

1. Functions

- Foster PROs' **discoveries** to be turned into **useful** products/services for public benefit
- **Balance** closed innovation with open innovation
- Reconcile **publication** with innovation via **patenting**
- **Exploit** improved **inventions** via commercialisation/licensing
- Develop **durable partnerships**

2. Requirements

- **Competence** (e. g. science, IP management, law, business development, etc.)
- **Skills/talents** (e. g. psychology, trust, credibility, negotiation, etc.)
- **Experience** (e. g. academic, organisational, legal, business, etc.)
- **IP rights** adequately provided to the research grantee (regardless of the source of funding)

14. Responsible Partnering in University Technology Transfer and Technology Transfer Offices 2

- Responsible Management of IP in Knowledge Transfer 1 -

*Recommendations of the Commission of the European Communities:
C(2008)1329; 10.04.2008*

- *Management of intellectual property in knowledge transfer activities*
- *Code of practice for universities and public research organisations*

3. Management of IP in knowledge transfer activities

11 Recommendations for Member States inter alia:

- **Ensure that PROs define knowledge management as a **strategic mission****
- **Establish and publish policies and procedures for **IP management****
- **Ensure **IP protection****
- **Develop knowledge **transfer capacity** and skills in PROs**
- **Promote broad **dissemination** of knowledge created with public funds**
- **Improve the **coherence** of IP ownership to facilitate cross-border collaboration**
- **Ensure the widest possible implementation of the **code of practice****

14. Responsible Partnering in University Technology Transfer and Technology Transfer Offices 2

- Responsible Management of IP in Knowledge Transfer 2 -

4. Code of practice for universities and PROs

- Principles for an internal intellectual property policy (development of IP-policy)
- Principles for a knowledge transfer policy
- Principles regarding collaborative and contract research

Principles for an internal intellectual policy

7 Principles inter alia:

- Develop and publicise an **IP policy** as part of the **long-term strategy** and mission of the PRO
- Provide **clear rules** for staff and students
- Promote the identification, protection and **exploitation of IP** in line with the **strategy** and **mission** of the PRO

14. Responsible Partnering in University Technology Transfer and Technology Transfer Offices 2

- Responsible Management of IP in Knowledge Transfer 3 -

Principles for a knowledge transfer policy

7 Principles *inter alia*:

- Consider **all possible** exploitation mechanisms and all possible exploitation partners; select the most appropriate ones
- Develop **proactive IP** and knowledge **transfer policies**, but they should not be considered the prime objectives for the PRO's research
- Develop and publicise a clear **licensing policy** in order to harmonise practices within the PRO

Principles regarding collaborative and contract research

4 Principles *inter alia*:

- Make the **rules** governing collaborative and contractual research **compatible** with the mission of each party; take into account the type of funding
- Establish the position on all **ownership rights** as early as possible in the research project (ideally before it starts)

15. Contractual Aspects regarding Open Innovation 1

General Guidelines

- There are **no special model agreements** for open innovation projects.
- Special model agreements would be **not recommendable** because of the diversity of projects
- **Recommended rules and standards** for handling intellectual property are **applicable** for open innovation projects: e.g. **IP-Charta** 8434/07; **Handbooks**: Responsible Partnering Okt.-2009; Improving Knowledge Transfer/Voluntary Guidelines ISBN 978-92-79-05521-8, Commission Recommendation on the Management of IP ISBN 978-92-7909850-5)
- Generally the additional regulations **NKBF 98** are valid for public funding in Germany (<http://www.kp.dir.de/profi/easy/bmbf/pdf/0348a.pdf>)
- The creation of an **invention** is regarded **differently** (academia's point of view „not owed“; economy's point of view „owed“)
- Attention must be paid to not circulating information (no **profile-determining** or **proprietary know-how**, no „side-ground“ IP)
- Open Innovation is successful, if it is founded upon the principles of **reciprocity**

Open Innovation has nothing in common with „open source“, „royalty free“ or „public domain“

15. Contractual Aspects regarding Open Innovation 2

Type of Contract / Contract Denotation

- **Agreement on contract research**
- **Agreement on third-parties funding**
- **Agreement on cooperation**
- **Consortium agreement**
- **Agreement on scientific collaboration**
- **Aid agreement**
- **Know-how agreement**
- **etc.**

Important for public funding (e.g. in Germany): NKBF-98, EU-Framework Program, de-minimis-delimitation, principle of subsidiarity, etc.

Complexity: legal classification of the contract, particularly the differentiation between contract of services and employment regulations

15. Contractual Aspects regarding Open Innovation 3

Essential Elements of Contracts

- **Pre-contractual agreements:** memorandum of understanding, letter of intent, confidentiality, protection of know-how, term sheet for future cooperation, implications with termination of pre-contract, etc.
- **Preamble:** What are the interests and the aims of the partners? For what purpose is a regulation prepared? What is regulated? etc.
- **Subject of the contract / assignment of tasks:** detailed description / definition, binding project plan (generally as an appendix), rules for implementation, milestones, working papers, mutual provision of information, orientation on results / obligation on results, subcontract activities, etc.
- **Comprehensive definitions:** work results / projects results ("foreground IP"), input know-how ("background IP"), industrial secrets, associated partners / enterprises, protectable findings / know-how, protectable / patentable inventions, fields of application, business area, contractual territory, etc.
- **Exchange of personnel:** Exchange of researchers (employees, Ph.D. students, etc.)

15. Contractual Aspects regarding Open Innovation 4

Essential Elements of Contracts

- **Right of use / exploitation:** “Foreground IP” (i.e. results owed, better to have separate agreement), “Background IP” (regulated by contract), exclusive / non-exclusive rights, limits for use (field of application, regional, temporary), patent- or know-how-license, licensing alliances, joint inventions (better separate regulation), adequate conditions, contract renegotiation / modification (bestseller clause), etc.
- **Guarantees / liabilities:** general law of obligations, contractual obligations, neglect of duties, compensations, changes of conditions or services, etc.
- **Payments:** should be fixed in detail in the project plan, costs regarding milestones, inventor’s bonus (different for science and economy), prototype construction, etc.
- **Legal prohibitions:** anti trust law, competition law, etc.
- **Conflicts:** applicable law, court of jurisdiction, mediation / arbitration (highly recommended), defense of property rights, etc.
- **Other standard elements:** positive / negative rights of publication, trust relations, uses for tests, uses in research or teaching, marketing, legal succession, etc.
- **Etc., etc.**

15. Contractual Aspects regarding Open Innovation 5

Model Agreements serving as basis (exemplary)

- **Model agreements for cooperation in research and development (German Federal Ministry of Economics and Technology)**
<http://www.bmwi.de/BMWi/Navigation/Service/publikationen,did=3429>
- **Model agreements Lambert Tool Kit**
<http://www.ipo.gov.uk/whyuse/research/lambert.htm>
- **Equitable Licensing (licensing apolicy and contract elements)**
 - **Focus: at first medicine, pharmaceuticals and health**
 - **Transferable to other technology areas**
<http://www.med4all.org>
- **DESCA model (development of a simple consortium agreement)**
<http://www.desca-fp7.eu>
- **Others: (e.g. CBI-Auril, EUCAR, unicANR, etc.)**

16. Subtle Drivers of Open Innovation

- **Restructuration** of companies
- **Changing product and technology life cycles**
- **Erosion** of oligopoly positions (e. g. markets, supply chains)
- **Changing relevance** and focus of R&D activities
- **Globalisation** of R&D activities
- **Role of government and society** (e. g. regulatory restrictions, approval, environmental policy)
- **Changing regulations**; institutional and political deregulation
- **Technological and institutional environment**
- **Public and private funding** of education and research; **IP-Policy**

17. Open Innovation Platforms 1

- Their Function -

- Stimulate the **exchange of knowledge** between experienced professionals
- Source, create and **promote new ideas**, concepts opportunities and solutions
- Envision how these would **change the world**
- Function as **an interface** between academic (via „offers“) and users (via „needs“)
- Contribute to the **awareness** of open innovation and the **dissemination** of best practices
- Identify and explore **new fields** of application
- Develop training tools for in-house and public **continuing education**
- Develop and provide **benchmarking** criteria

Successful innovation under conditions of financial constraints, uncertainties, change, and increasing complexity can only be achieved through collaborative approaches that integrate knowledge inside and outside the organisation

17. Open Innovation Platforms 2

- Some Examples -

- **www.brainfloor.com**
- **www.fellowforce.com**
- **www.hyve.de**
- **www2.innocentive.com**
- **www.jovoto.com**
- **www.openinnovators.net**
- **www.atizo.com**
- **sciclips.com**
- **socialearth.org**
- **tsmc.com**
- **.**
- **.**
- **.**
- **and many others**

17. Open Innovation Platforms 2

- Some Examples of Networks -

- **BASF Future Business GmbH (development of new markets)**
- **IBM Innovation Jam (tool for business collaboration)**
- **Philips Open Innovation Campus (Shanghai, Eindhoven)**
- **Nokia Research Centre (collaboration with more than 12 universities)**
- **Procter & Gamble (Connect + Develop)**
- **Saint-Gobain (university network)**
- **Omron (more than 50 collaborative projects worldwide)**
- **Campus-Project in North-Rhine-Westphalia / Germany (e.g. RWTH Aachen, Campus Melaten 11 research clusters, Campus West 9 research clusters)**
- **Industry-on-Campus in Baden-Württemberg / Germany (e. g. BASF/University of Heidelberg, IBM/University of Stuttgart, SAP/University of Karlsruhe, Bosch/University of Karlsruhe)**
 -
 -
- **and many others**

18. Price-Tagging of Inventions and Innovation

- The **new** must be competitive with respect to **the best** existing on the market (and it must be able to endure as **even better**)
- Achieving the desired licensing royalties or terms of use is a mere matter of **negotiation** (and not a legal or ethical conception)
- All endeavours and developments should be focused towards the **future** (e. g. new markets, cost reduction, supersession)
- Relevant is a **long-term** success strategy in the lights of the new invention or innovation (e.g. drawbacks if the invention or innovation were not available)
- All expenditures or resources consumed to achieve a certain step of the innovation are **irrelevant** to the future user
- As a benchmark of value of **similar** technologies and innovations can be used

The terms of use of inventions and innovations from scientific fields are subjected to very large variations

19. Benefits from Open Innovation 1

- General Aspects -

Open innovation promotes and develops

- Mutual **knowledge**, trust, and **respect**
- **Sharing of resources**, specific data, and facilities
- **Sharing** of technology transfer and **commercialisation** of research **results**
- **Joint development** of new technologies
- **Explorative** research
- Strategies for **pro-active use of IP**
- Opportunities and **creation of value** for organisations inside or outside their core business

Next steps

- Challenges of **balancing** closed and open innovation
- **Global** open innovation process
- **Connected** innovation
- Open innovation strategies and **new business models**
- Open **entrepreneurship**
- **Embedded** innovation

19. Benefits from Open Innovation 2

- Response of Companies -

(Survey of Technology Management Group / University of Karlsruhe, 2008)

Major Factors

- Dissemination of **knowledge**
- Strengthening of **competitiveness**
- Early identification of **needs** and **trends**
- Exploitation of **new business** fields
- Reduction of **time-cycles** of innovation processes
- Increase in **success rates** of innovation processes
- **Opportunities** for conjointly solving problems

Minor Factors

- Reduction of R&D **costs**
- **Recruitment** of know-how
- **Loss** of know-how
- Loss of control and loss of **independence**
- **Financial return** from knowledge sharing
- Exploitation of **unutilised** in-house **knowledge**

20. Embedded Innovation

- Building Business and Societal Intimacy -

Major Interactions

- Influence of technological **innovation** on societal **demands** and vice-versa
- Multiple **understanding** of social **engagement** and innovation **processes**
- Greater **connectivity** between the **public** and all actors of the **innovation chain**
- Better **understanding** of large scale innovation to face global **challenges**
- New opportunities for **increasing** the popularity of **creativity**
- Establishment of a **durable base** of competitive advantages

Major Effects

- **Driving** research and innovation **investments** by public procurement
- Developing **societal engagement** of industrial enterprises
- Extending **innovation-friendly** ecology to neighbouring countries
- Moving from **one all-purpose** solution towards **solutions tailored** to particular contexts (e. g. global, national, regional, local or by sections)
- Creating new **products** increasingly embedded in **services**
- Creating new **opportunities** for more radical **changes**

21. Impact of Open Innovation and Patenting on Academic Research 1

1. Positive aspects

- **Enhance the status** of public research with respect to industry and the society
- **Lift the level of awareness for own IP and the reputation** of the university
- **Motivate** researchers and increase their productivity
- **Emphasise the performance** and potential of research
- **Provide financial resources** for the university from contractual research
- **Exploit inventions faster; acquire** additional R&D projects
- **Create spin-offs and start-ups**

2. Negative aspects

- **Reduces** commitment for teaching and basic research
- **Limits** the design and content of **publications**; delay in publication
- **Rearranges long-term basic research in favour of short-term projects**
- **Can decrease the independence of research**; reliance on industrial funding
- **Neglects duties** concerning public and **structural funding** of the university
- **Can involve university in long-term and costly litigation**

21. Impact of Open Innovation and Patenting on Academic Research 2

3. General remarks

- **Policy** literature and recommendations mostly refer to the **advantages** of university patenting and collaboration with industry **without balancing** them against the costs or risks involved
- University researchers tend to **underestimate** the inventive potential of industry
- Increased focus on university IP rights **does not tilt the balance** between applied and basic research

4. EURAB-recommendations

- Integrate **societal aspects** into university curricula
- Encourage **interdisciplinary dialogues** as factors influencing researchers' careers
- Develop and disseminate **voluntary guidelines** (e.g. on good practices, good achievements)
- Identify and discuss future **research initiatives** with representatives of the civil society
- Bring together **societal actors** on technology platforms
- Include research and studies of **societal relevance** in the EU framework programmes
- Engage representatives from **civil society** as partners in the **evaluation** of research activities

22. Products from Open Innovation Projects

- The Street Scooter – RWTH Aachen University 1 -

How it started

1. Prof. Kampker's theses on the future of electro-mobility

- Electric vehicles play a leading role in **long-term solutions** to the world-wide challenges of mobility and the environment
- We need a **new efficiency class** which simultaneously satisfies both rationality and emotions
- Only economically priced **electric vehicles** will convince customers
- Germany must **speed up** and collaborate in **coordinated networks** of manufacturers, suppliers, universities, communities, and policy
- We need extensive **education and training** to overcome shortcomings and to be prepared for the future
- The **combination** of production knowledge and product knowledge **is decisive** for success



22. Products from Open Innovation Projects

- The Street Scooter – RWTH Aachen University 2 -

Making it happen

2. The idea and vision

Electro-mobility as a chance for the environment: *Ecological, affordable, individual!*

3. The project

- StreetScooter as a platform for innovations
- StreetScooter as an electric car ready for series production
- StreetScooter as a community

4. The modular approach

The RWTH-Aachen open interface innovation

- Key partners for development
- Integration of suppliers
- Open call for tenders for development tasks



22. Products from Open Innovation Projects

- The Street Scooter – RWTH Aachen University 3 -

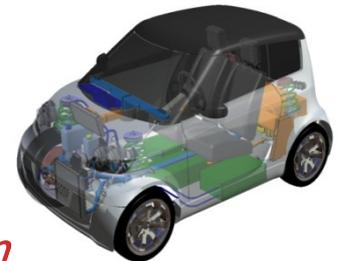
The networking partners of the collaboration

RWTH Aachen University

- 1- Institut für Kraftfahrzeuge (IKA)
- 2- Institut für Stromrichtertechnik und Elektrische Antriebe (ISEA) – 2 Departments/Chairs
- 3- Institut für Elektrische Maschinen (IEM)
- 4- Werkzeugmaschinenlabor (WZL) – 5 Departments/Chairs
- 5- Institut für Regelungstechnik (IRT)
- 6- Institut für Integrierte Systeme der Signalverarbeitung (ISS)
- 7- Institut für Hochspannungstechnik (IFHT)
- 8- Institut für Schweißtechnik und Fügetechnik (ISF)
- 9- Institut für Eisenhüttenkunde (IEHK)
- 10- Institut für Kunststoffverarbeitung (IKV)
- 11- Institut für Textiltechnik (ITA)
- 12- Technologie und Innovationsmanagement (TIM)
- 13- Institut für Bildsamer Formgebung (IBF)
- 14- Forschungsinstitut für Rationalisierung e. V. (FIR)
- 15- Fraunhofer-Institut für Produktionstechnologie (IPT)

Industry / SMEs

- 1- Wittenstein AG
- 2- Dräxlmaier Group
- 3- Aumann GmbH
- 4- AB Elektronik GmbH
- 5- Laser Bearbeitungs- und Beratungszentrum GmbH
- 6- IBG Automation GmbH
- 7- STAC Elektronische Systeme GmbH
- 8- Jakobs Houben Technologie GmbH
- 9- ZenTec automotive GmbH
- 10- Heinrich Eibach GmbH
- 11- konzept GmbH – innovative Ingenieurdienstleistungen
- 12- HEGGEMANN automotive AG
- 13- Mubea
- 14- IndiKar GmbH
- 15- Several others



All things considered together: A masterpiece of trustful collaboration and perfect logistics !

22. Products from Open Innovation Projects

- The Street Scooter – RWTH Aachen University 4 -

The result

The RWTH-Aachen's StreetScooter **meets all the requirements of tomorrow's mobility because it is**

- a straight electric car
- economical
- ecological
- safe and reliable
- flexible
- available in six different designs/models
- individual through modular construction
- suitable for series production



- **Street Scooter GmbH: im Grüntal 78, 52066 Aachen**
- **Prototype and pilot series: in 2011-2012**
- **Small series and large-scale production: in 2013-2018**

Knowledge, Ideas, Innovation...

Quotations valid for:

- **knowledge, ideas, concepts, thoughts, impressions, principles, illumination...**
- **knowledge transfer, partnerships, knowledge/innovation communities...**
- **open or closed innovation, internal or external innovation, innovation societies...**
- **green papers, European Research Area, European world-wide innovation...**
- **economic development, collaboration, competitiveness...**

„Having knowledge but lacking the power to express it clearly, is no better than never having any ideas at all“ (Pericles)

„You can have brilliant ideas, but if you can't get them across, your ideas won't get you anywhere“ (Lee Iacocca)

Examples, case studies, etc. :

For further dazzling reports, glaring pictures and flashy stories ...

just go to the internet ...