Protection and commercialization of research results – the view of a technical university

Conference
Intellectual property and beyond

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TUM. Dimensions

13 Faculties
156 Degree Courses
~32,500 Students, 33% Female Students, 18% Internat’l Students
~10,000 First-year Students
~5,140 Graduates
911 Doctorates completed
~5,000 Publications in peer-reviewed journals
478 Professors (incl. hospital)
~5,800 Scientific Staff Members (incl. hospital)
~3,200 Non-Scientific Staff Members (not incl. hospital)

€1,095 Mio Total Budget

<1,000 Research Agreements per year
Ø170 Invention disclosures per year
38 Patents filed in 2014
220 Patent families

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TUM ForTe Office for Research and Innovation
Munich Metropolitan Region

Research Network

Industry Network

Dr. Alexandros Papaderos

TUM ForTe Office for Research and Innovation
University Mission
(Bavarian Higher Education Law)

“… act together with economic and professional practice and promote knowledge and technology transfer."

Mission statement of the TUM

“… TUM is committed to progress and innovation in the fields of science that promise sustainable improvement in how people and society live.”

TUM IP Policy

“…the commercialization of research results is part of the mission of TUM."

“…TUM supports the formation of business entities (spin-offs and start-ups) on the basis of research results in order to pursue the implementation of such results in the form of marketable products, and thereby create new employment opportunities…”
Knowledge and Technology Transfer at TUM is done...

…by people
- conference attendance and/or presentations
- bachelor, master and doctoral theses in industry
- consultancy services
- latest trends
- contacts
- exchange of experiences

…by collaboration
- contract research
- co-operations
- strategic alliances
- access to external expertise and equipment
- creation of centres of scientific excellence
- establishment of long-termed relationships

…by IPR
- commercialization
- start-up or spin-of companies
- financial income
- reputation
- proof of competence
Life cycle of an invention in academia

Relevant sharing:
Inventor
Institute
University

Raising of awareness for patenting
Promoting and intensifying a patent culture
Providing an infrastructure

Commercialisation
Patent Application
Claiming of the invention
Generating reports of inventions
Evaluation

External Expertise
Release to inventors

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Patent strategy in academia

- reasons for patenting a university invention: commercialization (95 %), strategic considerations (5 %)
- when you want to patent an invention, it is all about its economic potential: will the user of the patent have a benefit from using it?
  - it doesn’t count if your invention is excellent science or how much time and money you have already invested
- to figure out the economic value is the most difficult part in the valuation of inventions
- the most common reason for a university Technology Transfer Office to not patent an invention is that the expected revenues might not cover the patent protection costs
- university inventions: prognosis is very difficult because they are often immature
Patent strategy in business

Patents as tools for

- **Protection**: ownership of ideas/products/processes against others
- **Licensing-out, cross-licensing**: generating revenues, market penetration, access to other technologies
- **M&A, patent portfolio transfer**: negotiating chips & deal makers, assets on the company accounts, means to impress investors & share-holders
- **Future developments**: pointing the way for others in business
- **Blocking/litigating**: building barriers to rivals
- **Reputation/proof of competence**: improving sales numbers, promoting company image
Patent strategy: questions to be asked

- What kind of IP do you already have?
- What kind of IP do you need?
- Do you need a patent?
- How to obtain this patent?
- How does the new patent fit in your business?
- How are you going to use the new patent?
- Can you defend or enforce your new patent? How?
- What alternatives do you have?
Patent strategy: costs and essential markets

- Patents need a certain **market penetration** in order to bring financial benefits.
- Their commercialization should at least cover the **invested costs**: research and development, protection, marketing, production etc.
- They should be protected in **key markets for manufacture and sale** but also where copies might be produced.
- If there is already a **licensee**, it is useful and sometimes part of the licensing deal to discuss with him the patenting strategy.
- Patents need to be **continuously valued** – but realistically.
- Patents should be **abandoned** if they cost more money than they bring in.
- Patents are **not to be used as academic publications** – from the cost point of view.

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Patent strategy: the right point in time

From: Osawa & Miyasaki, 2006, *An empirical analysis of the valley of death*
Evaluation of IP

- Evaluation of IP relies on the analysis of data with the purpose of rating the IP, i.e. of determining its importance
- The data cover the aspects that can influence the value of an IP asset
  - Legal aspects (e.g. information about the legal status of a patent)
  - Technology level of the innovation (e.g. comparison to the actual state of the art)
  - Information about the market (e.g. where are the markets for the patent?)
  - Information about the patent owner (e.g. what is the current situation of his company?)
Evaluation of IP

In the evaluation the following criteria are considered:

• The ownership status of the intellectual property
• The options for protection of the intellectual property
• The commitment of the inventors
• The maturity of development of the invention
• The size and features of the potential market
• The economic benefits
• The commercialization feasibility and potential returns
Valuation of IP

• Valuation of IP should be part of the good patent management within an organization.
• It means that you should know the economic value and importance of the IP you have created.
• This information helps taking strategic decisions and can facilitate commercialization and transactions of IP.
• Examples of business situations where valuation is important:
  - M&A, joint venture or bankruptcy
  - Raising funds through venture capital or banks
  - Accounting and taxation
  - Licensing or assignment of IP
  - Support in court proceedings or arbitration
  - Support in internal decision making
Commercial exploitation of IP

- **licensing** of IP to companies (IP remains at the university)
- **sale and assignment** of IP to companies (IP is assigned to the company)
- provision of IP to **university spin-off or start-up** companies in form of:
  - exclusive licensing (IP remains with the university)
  - sale and assignment of IP (IP is assigned to the company)
  - sale or exclusive licensing of IP → university obtains equity in return
Comercialization Strategy
Things to be considered

- Technology and its uniqueness
- Stage of development
- Position in technology life-cycle
- Presence/absence of competition
- Technical, financial and marketing strengths of the parties
- Strength of protection (via patent or other IPR)
- Freedom for the licensee to practice the technology (FTO)
- Compensation expected to be realized over the term of the license (type of payments)
- Inventors and their contribution (current and future)
Factors hindering commercialization

- Technology maturity
- Gap between university supply and industry demand for technologies
- Clueless and reluctant researchers
- Unreasonable expectations about the value of IP
- Underestimation of future R&D-efforts
- Underestimation of market risk
- Bureaucratic and complex transfer mechanisms
- Inexperienced staff at Technology Transfer Offices
Lessons Learned - Challenges

• Integrating the Third Mission into the established structures and processes of a university

• Rules and regulations, e.g. IPR and employment regulations
  ▪ consider IP that is privately owned by students or researchers and that is maybe needed for your research
  ▪ involve always (and as early as possible) the legal and technology transfer staff of your organization
  ▪ don’t start working with third parties without a contract - prioritize contract negotiations
  ▪ define, document and secure background and sideground IP rights

• Aligning different cultures: industry and academia
  • document the research project progress (laboratory notebooks)
  • don’t rely (only) on personal relationships
Thank you for listening!