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Creating markets from research results

Conference report

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Attendees from about 40 countries filled the large conference room at the EPO headquarters. Plenary sessions with panel discussions were framed by a number of breakout sessions.

This report is issued as a follow-up to the conference “Creating markets from research results”, co-organised by the European Patent Office (EPO), the Organisation for Economic Co-operation and Development (OECD) and the Technische Universität München (TUM), and held in Munich on 6 / 7 May 2013.

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Introduction

Over two days in Munich in May 2013, a conference was held to explore one of the most consequential questions for Europe's economic future. Given the strength of its public research and the depth of knowledge among its academics, what more could be done to generate higher levels of innovation and inspire the creation of more high-growth ventures in Europe?

300 participants were drawn from many of those actively involved in creating markets from research results.

Under the auspices of the European Patent Office (EPO), the Organisation for Economic Co-operation and Development (OECD) and the Technische Universität München (TUM), 300 participants were drawn from many of those actively involved in creating markets from research results: major players like BMW, L'Oréal, Siemens and Philips; policy-makers and officials; as well as strong representation from those within academia who are building the bridges to take ideas and insights through the early commercial stages to the point when they can be adopted by the market.

For all of them, the standard model of spinning out intellectual property (IP) is changing fast. Innovation is becoming more collaborative. Science is being released on new open terms. Major players are pursuing research through partnerships and competitions. Universities are becoming more entrepreneurial. IP is still the foundation on which these new forms of knowledge and technology transfer and exchange are happening. As a starting point for innovation and collaboration, it is being pulled in many new directions itself, moving well beyond its legal core into more commercial and creative roles.

This report is designed to highlight the main points and findings raised during the presentations and discussions at the conference in Munich. It starts by reviewing the context in which universities are now operating. It then covers:

- trends in collaborations with industry;
- the emergence of a new entrepreneurial culture within universities;
- the scope for improved IP policies;
- techniques for gaining buy-in to IP within universities;
- and the changes that technology transfer offices (TTOs) are facing.

Finally, it highlights some of the strategic questions about IP that universities are likely to be asking themselves on their path to becoming the generators of Europe's next wave of growth.

A new mission for public research

High hopes are being invested in universities by Europe's policy-makers. In searching for new routes to growth, a premium is being placed on the creation of knowledge capital through public research and the commercialisation of IP. But how can universities realise this potential? What are the changes they will be expected to make? And how can they best develop partnerships with business and government?

For Europe, these are matters of some urgency. No-one doubts the quality of its scientific output. It has consistently led the world. It is just much slower, as the European Commission has noted, than other leading economic powers in turning the results into widely deployed innovations.

In the opening plenary session, senior officials from the EPO, the OECD, the German federal government and TUM shared their insights into the process by which universities can play a fuller and more dynamic role within each country's innovation system.

Essentially, they recommended that universities pursue four goals:

- manage their IP better;
- explore new channels to market through open science and through entrepreneurship;
- create open models for collaboration;
- and consider changes in how they organise themselves.

There is no one-fits-all approach, though each is likely to have a number of common features.

For Raimund Lutz, vice-president at the EPO, the priority is helping to install confidence at universities in bringing their research to market. 'They are at the centre of national and international efforts to solve global challenges.'

In taking a strategic view of their intellectual assets and demonstrating how they create value for the public, IP policies can vary significantly. 'There is no one-fits-all approach, though each is likely to have a number of common features.'

“Universities are at the centre of national and international efforts to solve global challenges.”

RAIMUND LUTZ, VICE-PRESIDENT EPO





“It is still too early to appreciate the full implications of open science in transferring knowledge.”

YVES LETERME, DEPUTY SECRETARY-GENERAL OF THE OECD



Better IP

In realising the potential within universities, the conference was told, everyone involved has to understand the value of research in creating new growth and identify how it can be managed as an intellectual asset. By adopting an IP policy, it becomes possible to set up clear incentives for researchers and industry, and engage them more actively in commercial activity.

For universities, it can represent a significant change in scientific culture.

Academics can no longer just invent and publish. They have to be aware of the potential for creating IP in general and patents in particular, as they are the principal currency for capturing the commercial value in research.

By adopting an IP policy, it becomes possible to set up clear incentives for researchers and industry, and engage them more actively in commercial activity.

During the course of the 2000s, universities grasped this lesson, doubling the number of their patent applications. However, the follow-up was less impressive. The number of licences and spin-outs rose much less quickly.

Up to now, TTOs have often been content to process IP. In future, they will have to take a more active role in managing and marketing it. Questions are already being asked about whether those who are under-performing have the capacity to catch up. Through the European Patent Academy and the European Commission, they can access a wide range of training and tools to improve their management of IP.

However, a consolidation into regional centres, which have the resources to manage all steps in the transfer of knowledge, is starting to happen in several European countries, either through official interventions or through market mechanisms.

New channels

The remit of TTOs is also expanding into new areas of activity. Two in particular stand out: open science and entrepreneurship.

Enormous amounts of data are becoming available through the web at the click of a button. For researchers, it is opening up new avenues for scientific discovery and for finding solutions to challenges in public policy. Likewise, universities themselves are sitting on significant reserves of data across all disciplines. According to Yves Leterme, deputy secretary-general of the OECD, it is still too early to appreciate the full implications of open science in transferring knowledge. The whole area is a developing area of policy that he is looking to explore with all those involved in the marketplace for knowledge.

A more immediate impact is being made on the transfer of knowledge by entrepreneurship: both from the inside and the outside of universities. Many researchers have already created spin-outs, but these often remain small in size. Fast-growing enterprises that create thousands of jobs, particularly in light of experience in the US, tend to be those founded by students who set up on their own when they leave – or when they drop out. A similar pattern emerged from an analysis of finalists at the Academic Enterprise Europe Awards:

the largest group of founders were doctoral students (38 % of the 28 founders who were interviewed), while professors were less numerous.

The winning formula, according to the OECD, appears to be: ‘an entrepreneurial culture based on academic knowledge’. For universities, it suggests that it is worth focusing as much on student entrepreneurs as on academic researchers.

Open models

In finding scientific solutions to everyday problems, you can no longer rely on a single source for inspiration. You have to build bridge across disciplines and between organisations, motivating experts from a number of different fields.

‘The core message is to pool the strengths of different actors within innovation who have previously been separated,’ said Georg Schütte, state secretary at the German ministry of education and research. ‘You have to build bridges between research in universities and elsewhere.’

In Germany this policy has led to the creation of national platforms and centres to bring industry, research and policy together to find solutions to five major public challenges in health / medicine, mobility, security, communications and energy / climate.

New structures

For universities, new forms of innovation have a number of consequences in how they organise themselves. A simple division into academic disciplines is no longer enough at somewhere like TUM. It has set up cross-disciplinary research centres to reflect the grand challenges in public policy, incorporating them into a matrix structure.

In creating an entrepreneurial culture, ‘you have to approach your students and foster a development of IP,’ says Wolfgang A. Herrmann, president at TUM. Of course, close attention still has to be paid to how your science is rated in the rankings, even though no measure is being made of your social and economic impact. ‘So we also take care of well-ordered, intimate interactions with industry, which makes our IP of extreme importance.’

IP is fundamental to commercialising research, although its use has tended to be relatively weak, because of ‘an early, narrow view of patent filing’, said Dominique Guellec, head of country studies and outlook division at the OECD. ‘The mandate of technology transfer offices is now widening to include IP management, as well as contract research and incubation,’ he said. ‘Another important feature is new mechanisms for technology transfer, such as open science. Advances in ICT are giving access to all areas of knowledge. Some barriers remain, but it is becoming a major bridge between universities and industry.’

A report by Adam Jolly, business writer and editor

Further reading: “Commercialising public research: new trends and strategies”, a report by the OECD, 2013.



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GEORG SCHÜTTE, STATE SECRETARY AT THE GERMAN MINISTRY OF EDUCATION AND RESEARCH



New forms of university-industry collaboration

A constant evolution is taking place in the terms on which universities and companies are engaging. Leading innovators, such as Bayer and L’Oreal, are building wider, more open forms of partnerships. Government agencies, such as Turkey’s funding programme for research and innovation, are reviewing the process of technology transfer with a view to eliminating any ‘bumps in the road’. Universities are exploring how they can package knowledge more effectively for the market and how they can offer the expertise that business expects.

Erkki Ormala, Aalto University



Ann M. Hammersla, National Institutes of Health



For many corporates, the priority is now on finding ‘a genuine commitment for knowledge sharing and trust’, so they can sit within an ‘ecosystem of innovation’ based on a free flow of ideas and talent. Often the result is a series of strategic partnerships with up to a dozen universities round the world, in which the goal is to forge trusted relationships, where fair rules for ownership and use of IP apply.

At L’Oreal, which currently works with over 200 universities, a different approach is being taken in opening itself up to new ideas from unexpected sources and from disciplines not normally associated with the core business. For the last five years, it has used a tool to review the whole world of IP and research, allowing the company to ‘visualise inventions’ and speed up the whole process of innovation.

At Bayer, an innovative competition is running to encourage a flow of suggestions from clinical researchers about novel targets for developing drugs. Grants of between €5,000 and €125,000 are awarded. Now in its ninth round, Bayer has picked up over 100 ideas so far.

In French universities, efficiencies are being made by combining TTOs into 14 regional groups, which can offer the breadth and depth of services that companies require. The state is putting a total of €900m into funding these accelerators in return for a 33% stake. After ten years, they are expected to become self-funding. Both universities and researchers are shareholders, so everyone has a financial model to follow.

The good of strategic partnerships is to forge trusted relationships, where fair rules for ownership and use of IP apply.

Heidrun Dorsch, Bayer



Frederic Caillaud, L’Oreal



In Sweden at the Karolinska Institute, 25 companies have been wrapped into a portfolio and floated on the stock exchange, as a means of giving them access to all the right professional and financial support. Trading as the Karolinska Development Fund, they currently have a market cap of €300m. To strengthen such commercial ties, Karolinska has also set up a series of long-term internships for its students, which can lead to them winning jobs and, ultimately, to a flow of research contracts for the institute.

In Turkey, a ten-year programme is running among TTOs to let them meet the challenge of operating on the right scale and with the right skills. For small and medium-sized enterprises (SMEs), in particular, the goal is to create a one-stop shop, so they can approach universities with confidence.

In Turkey, a ten-year programme is running among TTOs.

Representing a non-European view, the US National Institutes of Health, which traditionally holds strong ties with universities, commented on a review it conducted among its stakeholders in policy, business and research: why over 14 years was only one in 10,000 compounds making it all the way to the market and why was it costing \$1bn to complete the process each time? The response was to create fast-track collaborative partnerships between universities and business for 10–12 promising drugs that would otherwise have remained on the shelf.

A report by Adam Jolly, business writer and editor

Carl J. Sundberg, Karolinska Institutet



Patrick Terroir, Caisse des Dépôts



In setting the terms for all these different types of relationships, a series of points were made to the conference:

- Where possible companies prefer a single point of contact for conducting negotiations. Ideally, they would like a mechanism for bundling together all the different patents they might need for an innovation.
- At the early pre-competitive stage, many companies are becoming more relaxed about owning any IP and are waiting until they start developing an application before filing a patent.
- In the US, specialist licensing models are being developed for start-ups, giving them a one-year option without any IP or royalties.
- In pursuing initiatives to encourage collaborative research, the main players often come together to agree a standard set of terms, as well as setting a limit on the time for negotiations, as a way of speeding up innovation.
- It takes time to work out how new technologies might reach the market. Ten years ago, no-one in the US knew how to commercialise stem cells. Now, they are in repositories for everyone's use.
- TTOs are evolving from a role in which they patrol how any knowledge leaves a university to one in which they take a wider, more strategic role within the university's ecosystem.
- Some universities are encouraging their professors to join the boards of SMEs to gain an insight into commercial innovation, as well as to inspire more confidence in SMEs to approach universities.
- TTOs might once have recruited former academics and then lawyers, but are now looking more widely for those with commercial experience, who can speak for both sides.
- In building bridges between universities and business, training could be more widely used to develop professional expertise in the same way as in the US. Companies such as L'Oréal would favour the adoption of a specialised European qualification.

Fatih Yulek, TUBITAK



University-industry collaboration: highlights from the break-out

Strategic partnerships

Siemens and BMW prefer to work on several levels of intensity in managing the work of their companies with universities. Each company is engaged in several thousand active collaborations. Both operate with around ten universities at a strategic level. The selection of partners depends on the competencies and focus of research. Relationships are then developed by putting in place a liaison officer in each university and by drawing up framework contracts. To stimulate further collaboration, a strategic focus on managing the partnership is expected.

More collaborative TTOs

The US National Academy of Sciences commented on the trend away from the 'classical' TTO model towards a more collaborative working model. As well as transferring technology through patents and licences to industry, TTOs are also managing partnerships, creating collaborations and support technology commercialisation. Their focus is switching from one-time patent sales to strategic collaboration with industry.

Less paperwork, more trust

Industry and universities tend to rely on thick contracts, covering every potential liability. Even though patent lawsuits are rare, all panel members agreed that trust should play a larger role both in ownership of the research and disclosure of the results. The move towards more strategic partnerships and/or framework contracts is lessening the repeated negotiation of contracts. Instead, the partners can use agreements they have already made.

Academic motives

For all the value that research creates for industry, it can sometimes be easy to forget the academics who are creating the results. A study in the UK revealed that the incentives for those in research are different from their colleagues in industry. Personal benefits or financial remuneration hold relatively little appeal. Instead, if industry wants to encourage more interaction, it is often better to consider funding for research or learning experiences for students.

In the curriculum

As well as the transfer of IP, industry has the option of engaging directly with students through the curriculum. By supporting their projects, theses and dissertations, it can also test their competencies and skills as potential employees.

A report by Arno Meerman, University-Industry Innovation Network



Entrepreneurship in universities

Entrepreneurship is a key driver of economic growth and job creation. Universities are therefore important incubators to create the next class of entrepreneurs. However, many inputs are required for successful entrepreneurship in universities.

One of the most important is to create awareness of and skills for entrepreneurship. Motivated faculty and students need the right skills to identify entrepreneurial opportunities and to turn their projects into successful ventures, skills such as business planning, risk assessment, team and confidence building and negotiation. While there has been an increase in the number of IP-based start-ups created, faculty and students usually lack the relevant managerial skills and experience.

Even though individual characteristics are related with the likelihood of establishing or joining a start-up, entrepreneurship education can complement basic management skills and technical skills needed for business operation that are specific to the start-up process. Nevertheless the importance of skills to successful entrepreneurship is generally under-recognised and responded to in current training and university entrepreneurship policies.

A number of universities are investing in new educational programmes that engage a much wider cross-section of the university population to create awareness of and skills for entrepreneurship, such as:

- work study programmes;
- internships;
- mentoring relationships;
- workshops, seminars;
- all-campus initiatives;
- business-plan competitions;
- and, more recently, free online entrepreneurship courses.

There are numerous initiatives and approaches to create a favorable eco-system for start-ups at individual institutions in Europe. For example, the Aalto University and TUM provide a systems approach to nurture university start-ups, which consists not only of offering funding, but also entrepreneurship education, IP management, and various innovation services and platforms.

Many universities in Europe are taking steps to alleviate the financing gap ('valley of death') by setting up their own proof-of-concept funds and seed funds due to the lack of venture capital and government funding after the dot-com implosion and the financial and economic crisis. These funds, which are in most instances administered by TTOs, also provide advisory/technical services as well as technology scouting. Closely tied to financing is the provision of facilities and equipment through bridging organisations such as technology/business incubators and science parks in which new ventures can flourish.

A number of learning points can be drawn from the presentations and the discussion with the audience:

Clear vision and strategy

A university should have a clear vision and mission statement that sets out objectives with regards to their entrepreneurial strategy. This typically includes defining what entrepreneurship means to the university and outlining how and why it is supported. The strategy should also define the target groups and their needs and identify how the university will deliver this support to meet their needs. As university policies and rules have pronounced effects on the rate of start-up formation, the strategy and mission should be supported by policies that are consistently applied to: support and encourage start-up formation by senior scientists and students; involve TTOs actively; and provide opportunities for inter- and multi-disciplinary exchange/projects. However, universities should design and implement support systems that meet their own needs, resources, and objectives in a realistic manner.

A university should have a clear vision and mission statement that sets out objectives with regards to their entrepreneurial strategy.

Creating a sub-culture and networks of entrepreneurship

Recent evidence points to the central role of students and alumni in commercialisation: they tend to be more prone than faculty scientists overall to create and grow new companies, developing university innovation. Many of the spectacular successes can be assigned to this model. As such, activities, clubs and associations led by students and alumni should be encouraged and strengthened. These bottom-up approaches should be complemented with top-down approaches: providing platforms to connect aspiring university entrepreneurs with investors (venture capital firms, business angels and other informal investors) and successful entrepreneurs can be an effective mechanism to provide the necessary financial funds and management expertise.

Students and alumni tend to be more prone than faculty scientists overall to create and grow new companies.

Better measurement

In light of the limitations of a commercialisation strategy based mainly on a limited set of quantitative indicators, there has been growing concern about relying solely on these metrics, which underscore or underestimate the impact of entrepreneurship in universities. The impact of students and alumni start-ups is a case in point. Data, both qualitative and quantitative, can provide valuable information, when considering changes in university and government policies for fostering entrepreneurship in universities.

A report by Daniel Kupka, Directorate for Science, Technology and Industry, OECD



Better intellectual property policies for universities

In a context of increasing accountability, funding constraints, harmonisation requirements and a move from science-push to demand-pull policies, IP management adds up to a significant challenge for universities. The institutional role of universities and their TTOs as regards IP should be to become ‘enablers’ of research collaborations with industry and facilitate the exploitation and commercialisation of products derived from research results.

In that sense, the role of TTOs is much broader than simply managing IP filings, it requires managing multiple and increasing complex relationships, but not all universities are equally prepared. IP policies for universities at the institutional, regional, national and international levels should facilitate the accomplishment of the third mission of universities, while at the same time preserving their traditional teaching and research missions. Universities should not become producers of IP at all costs to comply with their third mission of knowledge transfer to society. They are first and foremost educational and research institutions and TTOs can help advertise their research to industry and society in general.



A number of messages came out from the presentations of participants and the open discussion with experts from the audience:

- Universities are very heterogeneous; only a few are performing well in IP.
- IP policies are about motivating people and creating incentives, not just about designing formal structures and processes.
- IP is not just about technology, there is a great potential in the transfer of other forms of knowledge produced at universities, such as teaching materials protected by copyright.
- TTOs have to manage increasingly complex contractual relationships.
- Making revenues from IP should not be the priority for universities and their TTOs. The price of IP has to be balanced with the need of further investments by industry to reach the market.
- There have been some attempts to harmonise IP policies at the EU level, but there are still stark differences across countries.

A number of proposals for better IP policies were made.

New metrics

There is a need to rethink indicators to measure IP performance at universities and build indicators of the overall impact of the IP generated at universities. Current rankings may not rely on the right measures. The number of patents filed by the university gives the wrong image when a large number of patents protecting inventions generated at universities are held by firms. There is a need to build new indicators about the IP performance of universities and measure their overall impact, but it is not an easy task.

Increasing the scale

A few top TTOs are doing well, as evidenced by results from several national and supranational surveys. TTOs need to join forces, bundle activities and offerings, within and across countries. This can be done by public initiatives or through competitive forces. Bundling offerings across institutions, within countries and cross-border, will increase the attractiveness of university offerings for industry, reduce transaction costs and facilitate collaboration, especially in technological domains where patent portfolios and families are much more relevant than individual patents. But there is a limit to the concentration of TTOs: personal contact and proximity to researchers is important. There is a plan in Austria, for example, to exploit synergies across TTOs as regards training, while keeping them as independent entities.



The key is to have clear and transparent rules at all levels from project funding to conflict of interest and royalty sharing.

Support for increasingly complex contractual processes

There is a need for soft guidelines, model contracts, support for the development of proofs of concept and professionalization of TTOs. The key is to have clear and transparent rules at all levels from project funding to conflict of interest and royalty sharing, as well as establishing well-defined boundaries between open science and proprietary IP. As regards the professionalization of knowledge transfer, a European certification for knowledge professionals would be welcome. A higher degree of mobility between industry and university will also be helpful to form better professionals. Knowledge transfer networks already provide professional training, but some TTOs would only attract the best professionals if they increase their scale.

Consolidation of harmonisation efforts

IP policies and practices at universities are still very heterogeneous across Europe, but there have been some harmonisation attempts at the EU level in the past few years. The IP Charter initiative launched under the German EU Council presidency in 2007 is a good example. It aimed to raise IP awareness, but there are still stark differences in levels of implementation across countries. Knowledge transfer is gaining importance in policy making and IP is expected to play a significant role in the new EU Framework Programme for research and innovation, Horizon 2020, where addressing societal challenges is the priority.

A report by Catalina Martínez, Institute of Public Goods and Policies, Spanish National Research Council



Awareness of intellectual property in universities

Rightly or wrongly, universities are often perceived as too bureaucratic or too independent by business. To encourage a greater flow of deals, what more can be done to build an environment in universities that is supportive of IP? This break-out session reviewed programmes and techniques on offer through leading agencies such as the EPO and the World Intellectual Property Organisation (WIPO), as well as national IP offices. It then considered where future priorities might lie.

Universities can only be either users of IP or victims of IP.

Participants thought the EPO had an essential role in building an IP culture within universities. Every day, researchers and students make thousands of queries about millions of patent documents through its Espacenet database. An understanding of IP is promoted through a comprehensive set of training materials and courses that can be absorbed into the curriculum, as well as into commercial activities.

These programmes are run in collaboration with IP offices based on a clear rationale according to Richard Flammer, principal director, Patent Information – European Patent Academy at the EPO, who commented that ‘universities can only be either users of IP or victims of IP’.

The WIPO is working in the same direction, but at a worldwide level: it realises needs assessment and recommendation activities, which subsequently permit the development of capacity building programmes, including train-the-trainers programmes. WIPO also develops yearly innovation indexes. In carrying out its objectives, it is working closely with national IP offices, and is making growing use of ‘extra budgetary funds in trust’, granted by governments.

SMEs often neglect IP and the potential for collaborations with universities. Compared to major players, many have little awareness of where and how to find cooperation. To encourage growth in the European economy, more activities in awareness and training could be undertaken to boost collaboration between SMEs and universities, taking into account the needs of both sides.

Another key target is the next generation. Programmes could follow the examples of developing the entrepreneurial skills of engineering students at Delft University or of business students at the Higher School of Economics in Moscow. As well as the direct outcome of creating innovative ventures, more indirect benefits are felt. Within the university, a culture of IP gains strength, as well as the structures for managing it. Momentum starts to build from the bottom, as well as the top.

Within the university, a culture of IP gains strength, as well as the structures for managing it.

Two further mechanisms for stimulating IP were considered and recommended: promotion and coercion.

- In Turkey, prizes and extra funding are granted based on four key metrics, including an ‘entrepreneurship innovation index’, to universities that dynamically use IP. In addition, academics can qualify for IP training and patent applications play a role in the development of their career.
- In Russia, funding reductions occur at universities that are not active in the commercial exploitation of their ideas.

The ‘national IP roadmaps’, which the EPO is already promoting in a few countries, could be a useful tool for universities in developing their IP. Equally, the practice among a number of national IP offices of sending advisors into universities to give guidance to researchers on patenting could be further encouraged, perhaps in combination with giving discounts on patent applications made by universities.

A report by Professor Laurent Manderieux, Bocconi University

Incentives for disclosing inventions and data

Incentives for researchers to disclose their inventions and data clearly have a positive effect on the process of transferring technology. The challenge is to find ones that are appropriate.

Some lessons can be drawn from the experience in business. As well as being formally required to make disclosures, researchers in companies compared to their counterparts in universities:

- are better trained and educated in IP;
- are more involved in the patenting process and the marketing licensing plan;
- are compensated not by a one-time fee but with long-term incentives;
- depend directly on the success of their company;
- and are more enterprising in how they pursue projects.

Their managers have a stronger interest in IP and follow a more structured process in its development. Decisions are made transparently. Clear budgets are set for filing and product development.

For universities, seven main lessons can be drawn in improving their rates of disclosure:

Transparency before disclosing

Put the following framework in place and make sure researchers understand it:

- The IP strategy of the university.
- The criteria for selecting which disclosures will be filed as patents (it is frustrating to write an invention disclosure that is not filed without a clear explanation).
- The filing process and what input is required (inventors don't want to be bothered with too much paperwork).

Transparency after filing

Keep researchers actively informed on:

- The status of the IP filing (what has happened so far? in what countries has it been filed?).
- The use of the IP (have there been requests by companies? has it been licensed, has it been sold?).

Incentives for the researcher

- Financial (special bonus, success fee).
- Non-financial (these are often more important than the financials, eg, announcements at official events, dinner with the president, IP Wall of Fame etc).



Culture

- The goal must be to create a spirit of entrepreneurship.
- Culture must be set, communicated and lived by top management.
- The inventor must feel that his invention is handled with care, quality and speed.
- Conviction that patents are not unethical (unfortunately, in some departments this thinking still exists).
- Students develop a clear understanding and positive attitude towards IP.
- Overcome problem that PhD student would like to disclose invention, but principal investigator would not.

Help with publication of invention

- Support to overcome the conflict between publishing and patenting (most often seen as a choice between the two).
- Publication matters most to researchers, so work with them to find a way to patent as well.

Personal interaction

- Build a rapport with the researcher and decide together what is suitable for disclosing.
- Dedicate someone, such as a technology scout, to working with researchers.

Clear communication of the advantages of IP

- Helps to generate research funding (companies scan patent databases for potential collaborators).
- Helps to get funding (in case of start-ups, venture capital will put a strong focus on patents).
- Keep in mind other types of IP, like copyright, or alternative ways (in some industries other factors are more important, like first to market).

Overall, the goal is to build up trust and transparency, giving researchers the confidence to communicate their ideas without seeing a conflict between patenting and publishing. It is also worth staying open to new forms of working. For instance, assemble a cross-disciplinary team of students to evaluate a researcher's idea, then form a company and put the inventor on the board. For corporates, one model for incentivising disclosure is the one adopted by Qualcomm. It is investing in the research undertaken by start-ups or spin-outs in return for retaining the right to buy up to half of the patents generated for a price agreed in advance.

A report by Christian Hackl, TUM



Overall, the goal is to build up trust and transparency, giving researchers the confidence to communicate their ideas without seeing a conflict between patenting and publishing.

Technology transfer offices: direction and governance

The role of TTOs is evolving rapidly, raising numerous questions how best to set them on the right course and how to govern their performance.

In the US, TTOs are increasingly business orientated and experimenting with new organisational structures, for example, alliances with large pharmaceutical companies. Other hypothetical alternatives are being considered. One is the so-called Kauffman model, which vests rights with inventors while maintaining university ownership.

The TTO at the Norwegian University of Science and Technology highlighted the tension that can occur between the dissemination of knowledge (impact on society) and the orientation towards business. For TTOs, it creates several dilemmas:

- Should you be organised as a service or a business?
- Should researchers be seen as masters, suppliers, clients or costumers?
- Is money a means to an end or the end to itself?
- What is the right operational model (do the best you can with the money available or manage by objectives)?
- Should a spin-off exit maximise profit or benefit society?
- Should the TTO be loyal to venture capitalists or to entrepreneurs?



It was concluded that corporate governance must be independent from the university, although aligned with its strategy (and politics), as well as being operationally compatible with industry.

In France, the goal was to reduce the fragmentation of the technology transfer system.

In France, SATT (Société d'Accélération du Transfert de Technologie Ouest Valorisation) represents a new form of governance for TTOs. The goal was to reduce the fragmentation of the technology transfer system, to improve operational efficiency, to invest in IP and proof of concept, and to create competitiveness, as well as wealth, from public research.

During its discussions, the panel identified four principal challenges in adopting the right model for setting a TTO's direction and governing its course:

- There is no single standard or template: any structure evolves over time.
- The evaluation of the efficiency and effectiveness of the various TTO models is hampered by the lack of good and standardised performance indicators.
- TTOs continuously have to find a balance between the different demands of the three main stakeholders (researchers, taxpayers and industry).
- More attention has to be paid to knowledge transfer in the fields of social science and humanities.

Four major points emerged as essential in the discussion of governance models for TTOs.

Core mission

The governance has to be aligned to the relative priority given to the missions of: (a) revenue generation; (b) economic development; (c) faculty/public service; and (d) reputation.

Specialisation

The type of specialisation (discipline and task specialisation) influences the governance of TTOs.

Who

The priority given by universities' management to knowledge and technology transfer, the organisational location of the TTO, as well as the TTO personnel, have an impact on TTO's governance.

Evolution of TTO

On the one hand, the natural evolution over time and on the other hand, the evolution of the technology transfer system, influences TTOs' governance.

A report by Anja Schoen, TUM

Future questions for how universities manage intellectual property

As universities develop their IP strategies, they face a series of dilemmas on the nature of the impact they are making on society and in business. In setting up external engagements, particularly in a commercial context, speed and clarity matter. If too many people vet deals and too many rules are followed, deals soon fold and projects are shelved.

Few within universities would pass up the chance of launching a venture that could eventually sell for €100m and make a return of €10m for the university. Such an outcome is clearly a best case alongside all the many other smaller everyday transfers. For Professor Dietmar Harhoff, director at Max Planck Institute for Intellectual Property and Competition Law, the objective of IP management is: ‘to allow the potential for commercialisation while retaining the fundamental integrity of the research apparatus’. Joined by five other leading figures in the transfer of European knowledge, he was a part of a panel that debated many of the challenges that universities encounter in managing their IP.

The top performers are learning how to operate as significant commercial forces in their own right without undermining the integrity of their core commitments to research and education.

Complexity

Universities are inherently complex, serving a wider range of goals than a company, which can direct its focus at making profits from its products. In commercialising research, clashes typically occur between the commercial and the scientific; and between the private and the public. There is no standard solution. Depending on its research culture, each university will reach its own conclusions. The top performers, however, are learning how to operate as significant commercial forces in their own right without undermining the integrity of their core commitments to research and education.

Mechanics

In companies, strategies often depend on IP. For universities, it usually remains non-core. As a result, they tend to lack a professional structure for IP management in which a clear lead is given in meeting a set of targets. It was observed that TTOs tend to work best either when they have a direct connection to the university’s senior leaders or when they have the freedom to make their own decisions. One option that many universities are now exploring is how in partnership with each other they might bundle together some of the activities that each of their TTOs is now pursuing separately.



Richard Hudson,
conference moderator;
Giancarlo Caratti,
European Commission;
Alexander von
Frankenberg,
High-Tech Gründerfonds;
Ove Granstrand,
Chalmers University;
Dietmar Harhoff,
Max Planck Institute for
IP and Competition Law;
Laurent Miéville,
University of Geneva;
David Sweeney,
Higher Education Funding
Council for England
(from left to right)

Pricing

The model of extracting as much value as possible from IP is widely seen as counter-productive within universities, because it undermines other forms of commercial and social interaction. A more subtle form of pricing guidelines might be used to take account of a university's broader social and economic goals. Or a local company might be chosen to develop a technology in preference to a major player from elsewhere in the world.

Exclusivity

A tension exists in how licences are granted. In principle, a university would prefer non-exclusivity, so the results of any research are distributed as widely as possible for public use. In particular, it will generally avoid tying up the rights in an early-stage breakthrough. In practice, however, an early-stage commercial venture may well depend on an exclusive grant of IP for its survival. One condition that universities are starting to consider, particularly in the US, is placing restrictions on the future use of a technology to safeguard the integrity of the initial research.

Basic / applied

Some universities draw a distinction between basic and applied research. Commercial work is typically undertaken to fund the pursuit of pure science. Others believe research is a seamless whole in which all researchers co-operate on the basis that it is hard to be too systematic about how knowledge will cross into the market.

Forms of IP transfer

In universities, patents are widely seen as the principal link between science and the market. Even if they are not making a commercial return, they act as a proof of invention that will trigger follow-up inquiries from business. Universities differ on the emphasis they put on the softer forms of knowledge, such as know-how. In the UK, for instance, all forms of knowledge transfer and business interaction are encouraged, before jumping to any conclusions about how to wrap up the IP.

In universities, patents are widely seen as the principal link between science and the market.

Consultancy

Differences in approach to IP are particularly clear in the case of consultancy. In Germany, faculty members are generally free to work on their own projects for one day a week, as a way of improving their practical knowledge of their subject. In Switzerland, the test is that if an academic has undertaken a project in a faculty lab then the university owns the IP. Otherwise it stays with the academic. In the UK, by contrast, consultancy is regarded as a major source of business interaction in its own right and engagements are managed by the TTO.

For universities, the best results usually occur when their IP management is connected up internally and externally.

Performance

For universities, the best results usually occur when their IP management is connected up internally and externally, rather than run in isolation. In liaising with academics and supporting their creative freedom, TTOs can offer to work with them in publishing the results of their research, while securing their IP at the same time. Externally, many TTOs endeavour to sit within a broader ecosystem of innovation. A university like Geneva, for instance, can be as busy as Stanford in its commercial activities, because it has played a leading role in creating an active market for technology on its doorstep.

Grace periods

When an academic wants to submit a paper quickly, its publication may well jeopardize any patents that the TTO might file. In markets like the US, Canada and Australia, this conflict is eased by a 'grace period' that allows the disclosure of an invention in a journal or at a conference six months to a year before filing for a patent. For Dietmar Harhoff, the adoption of this practice could open up 'a reasonable avenue' for Europe's universities in their efforts to manage their IP more actively.

Alternative structures

Not all agree that academics have to use their own TTO. Some argue that they could have the freedom to go to other universities or bring in their own advisors. In principle, some also believe that TTOs should be able to work for inventors from other universities or from within their region. In practice, TTOs are generally too busy working for their own academics and are too closely tied into the overall mission of their university.

Not all agree that academics have to use their own TTO.

Benefits

Universities now accept that the transfer of knowledge is essentially not for profit with any surplus going back into research. In making an impact, what other benefits might a university see? Suggestions included:

- Companies following up the university's inventions by asking for more data and by commissioning more research.
- Spin-outs creating an ecosystem of local innovation that support the future development of the university's research.
- Students choosing to attend more commercially aware universities.
- Donations from the founders of start-ups, which often become a major source of finance.

Laurent Miéville, director of Unitec, the TTO at the University of Geneva, admits that it has been making a loss for the last ten years. 'But we have had 15-20 start-ups that have received \$500m which they are mainly spending locally. If we do then find a blockbuster, then we really will start making money.'

A report by Adam Jolly, business writer and editor



Summary

For universities, the fundamental commitment to the creation of new knowledge and developing the next generation of talent remains the same. However, as the conference heard, the mechanisms and terms on which they are engaging with business and society are changing fast.

Innovation is becoming more open and collaborative. Knowledge circulates more quickly and freely than ever. Entrepreneurship, both on and off the campus, is accelerating the transfer of academic insights into everyday use. Many of these projects and ventures are happening within an 'ecosystem of innovation' located around the university in which knowledge, talent and funding closely interact, creating a cycle of spin-outs and start-ups. Some universities are well advanced in managing these new possibilities and expectations. Others are still exploring which path to take. All are still learning lessons in how to fashion the right strategy and how to make it happen.

One certainty is that IP plays a central role. Whatever forms the transfer of knowledge and technology take, it still acts as the grammar on which everyone depends to express themselves. Without it, credibility is hard to establish and trust soon erodes. At an early, collaborative stage, you might decide to share the IP between all the partners. Closer to the market, you will be looking for tighter control of patents and other types of IP to secure the basis for engagements with all those involved in the chain of innovation and growth.

The aim of the conference and its follow-up activities was to give confidence to universities and public research organisations in bringing the results of their research to the market. Depending on the role and mission of each institution, IP policies will differ. No one size will fit all. The challenge for leaders in universities is to take a strategic view of their intellectual assets and demonstrate how they are creating value for the public. It is becoming an increasingly complex task. Originally, the process of technology transfer might have been limited to keeping track of the creation of IP without necessarily having the skill or capability to commercialise it. Expectations are now being set higher. No-one can now wait on the value to emerge from patents. IP is being much more actively managed alongside other activities such as contract research and incubation. To realise all the potential in these complex interactions, the conference was designed to map out the directions that universities and public research organisations can take in the years ahead to inspire academics, engage business and benefit society.

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A report by Adam Jolly, business writer and editor

Conference steering committee

Noël Campling, European Patent Office

Giovanna Oddo, European Patent Office (co-ordinator)

Mario Cervantes, Organisation for Economic Co-operation and Development

Daniel Kupka, Organisation for Economic Co-operation and Development

Evelyn Ehrenberger, Technische Universität München

Alexandros Papaderos, Technische Universität München

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Adam Jolly

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Bob-van-Bentham-Platz 1

80469 München

Germany

Tel. + 49 89 2399-5454

academy@epo.org

www.epo.org/learning