

CHAPTER

Obstacles to University- Industry Relations

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THE MISSION OF UNIVERSITIES

The future of our universities — the traditional higher education institutions — is often subject of discussion and careful analysis, as can be seen at the fourth Glion Colloquium 2003, “Reinventing the Research University” (Weber & Duderstadt, 2004).

It seems to be widely agreed that there are three main activities that universities on all continents — with varying emphasis between them — are engaged in. These three fields are:

- I education;
- II research;
- III service to society.

These three goals — in this particular order — certainly reflect the expectation that industry has of modern universities.

Back in medieval times, the first universities were established to distribute knowledge and to educate students, and even today this continues to be the main task of a university from an industry perspective — to prepare students for a career as professionals in the various areas of economy and society.

Only in the following centuries was an additional function, which we know as research, established. It is seen as the basis for the development of science and technology, which have progressed impressively since then and are influencing our lives and our society today more than ever.

The universities' task of research continues to grow in importance today as more and more enterprises — even the large multinational high-tech

companies — cannot afford to rely on their own research activities alone anymore in order to create innovative products and services — as many of them used to do in the past (e.g. SIEMENS, DAIMLER, IBM etc.). Today the creation of a successful network of cooperating research partners from industry and academia is considered a prerequisite for a future-oriented, innovative company.

The third role of the “university of the future” — service to society — is the most recent one.

It may be of a purely economic nature and aid the development of a region, as seen in Silicon Valley. It may include supporting governments in the role of “neutral advisors”, providing the subject-matter knowledge needed to make informed political decisions. It will almost certainly involve educating the public and the media about the benefits of modern technology and the impact of scientific results on society.

In all three core activities the relationship between university and industry is an important element. Now, what are the current obstacles to those relations between universities and industry? How can the interactions between players as different as a university and an industrial enterprise be improved?

Obviously, there is no single simple recipe that will solve all problems in a community as heterogeneous as modern universities. Besides, there are outside factors to consider, like the significant influence that regional and state governments still have on the majority of universities.

Some recommendations applicable to some institutes don't work for others. However, some of the following issues — ranked by priority — are seen as relevant to a wider range of universities.

INTELLECTUAL PROPERTY RIGHTS

If asked to name the most pressing obstacle in the relationship with universities, industry representatives will mention most frequently the area of intellectual property rights (IPR). This applies to both sides of the Atlantic Ocean and for small and large companies alike.

Especially in recent years of reduced university budgets, government or university officials realized that some universities manage to gain significant income through the licensing of technology to companies. As a consequence, more and more universities are being urged to strengthen their efforts to produce licensing fees when transferring research results to companies.

But this analysis overlooks the fact that patents play a completely different role in industry than they do in the world of the university. They serve as a protection of industrial investment in R & D, in one case, and as a potential new revenue stream, in the other case, developed by newly gained knowledge from the universities.

Patent applications — first they cost a lot of money and it takes a long time to get a break even if patents are considered to be an additional financial source for universities.

Looking at some known examples of where significant income could be made through licensing, it is hard to imagine that those very few can be generalized and applied to other universities. In most cases these licences were generated in a very specific small sector — like life science — and are based on a unique time window constellation or a specific situation hardly duplicable.

As a consequence of a new IPR policy, many technology transfer centres are now established at universities, or at least the IPR activities of a university are centrally run by a professional patent unit. Their first objective is often seen to be earning money and to finance themselves, rather than to encourage university-industry cooperation per se.

Therefore, negotiations between industry and their cooperation partners at university institutes are now often delayed and complicated through the involvement of those services resulting in less productive research collaborations with industry.

It is an interesting fact that in the U.S. the Bayh-Dole Act has the unintended consequence that U.S. industry now is often approaching non-U.S. universities for collaborations due to faster and simpler IPR negotiations with them compared to their U.S. counterparts.

In this decade of globalisation and modern communication technology, industry is free to collaborate with any university worldwide, rather than being limited to just the regional contenders.

Industry's IPR principle is clear: if a company has paid for 100% of a specific piece of knowledge generation, they want all the results and IPR for their own use. It is their view that they have paid for the infrastructure already with their taxes. Also any pre-existing background knowledge of the institute is seen merely as a selection criterion when choosing one university over another.

If both partners, university and industry, jointly participate in publicly funded research programmes, or if the industry partner pays only part of the research activity, then the IPR of any knowledge generated may be owned by both depending on the individual shares.

The universities' IPR activities described above are often considered to be based on some misunderstandings in the IPR area and are seen as main obstacles in the cooperation. But they should always be seen in the broader perspective of the overall goal of cooperation rather than trying to maximize IPR at the expense of further cooperation.

If both parties — universities and companies — try to understand each other better and mutually agree on the overall goal to strengthen research collaboration as a whole, a major obstacle to relations between the two will be reduced.

COOPERATION CULTURE

On the whole, the **cooperation culture** as a basis of university-industry relations has improved significantly over the last years.

Nevertheless in certain sectors and in certain countries, close cooperation of a university scientist with industry — perhaps based on a strategic cooperation agreement — is sometimes suspected to undermine their scientific reputation and as a consequence they might avoid such cooperation altogether.

The goal instead is an open situation, as exists in some of the top-ranking U.S. universities. There signing a strategic agreement with industry and researching for the Nobel prize run in parallel, and both are based on scientific activity. **Both activities are fully accepted** and seen as complementary activities undertaken in the same institute.

Some private universities in Europe have already successfully reorganized their research activity by aligning it with the research strategies and the needs of their industrial partners.

This is not in contradiction to conducting cutting-edge research and excelling in basic science if the university institute treats the industrial strategy merely as additional input only in order to broaden their research portfolio, and if they keep full freedom and responsibility in directing and orienting their own independent university research.

In addition there may be **special incentives** needed to strengthen the research collaboration, depending on the specific level of a particular nation's innovation system.

For instance the Federation of German Industries (BDI) proposed that the German government should provide an **additional financial bonus to those university institutes** which successfully closed an industry contract — the research activity selected by both partners would be doubled and the results (IPR) would be owned by both partners. This way universities would have an incentive to initiate industrial collaboration and the public money spent by the university would be allocated in areas of interest for Germany's industry — the expectation being to boost both employment and economy.

Even if such incentives are applicable to a limited number of research sectors only (e.g. engineering and life sciences) and even if they don't cover the whole wide spectrum of academia, it may well serve to improve the relations between industry and universities as such.

EDUCATION

As mentioned before, the most important task of a university is **education**, and here the relation with industry is very successful — potential for improvement can only be seen in a higher flexibility and responsiveness to industry's

demand and to market requirements — examples include upcoming new disciplines in research (e.g. biotechnology or information and communication technology) or new interdisciplinary education. The new Bologna process and the European Education Area are not yet homogeneously interpreted across Europe, due to a heterogeneous environment and varying degrees of government support.

The ambitious objective to reach mutual acceptance of equivalent university degrees (bachelor/master vs. diplomas) across European nations has yet to be implemented in order to meet the requirements of today's global industry.

SERVICE TO SOCIETY

In universities' "service to society", special attention should be paid to the regional development — especially the development of small and medium businesses in the region, which incidentally in many cases are high-tech spin-offs started on university campuses.

It is quite obvious that the region — its economy as well as its cultural environment — may benefit greatly from successful university activities and vice versa. Well known examples include MIT, Cambridge or Munich. But often such successful symbioses are not based on regional strategies, but were created from a personal network or even happened by chance.

The regional component of supporting the local economy and industry may even be part of a top-down strategy from universities in general — at least for those parts or institutes in which the research fields indicate such relevance.

Universities as a breeding ground for new start-ups have a significant multiplier effect as well, at least for specific technology disciplines in which the universities are able to support growth and employment — electronics or biotechnology.

In some nations, like Finland, such a third dimension for universities' objectives is already being discussed and is close to being introduced as an explicit responsibility of university management and it should be seen as equally important as the other two objectives — education and research.

UNIVERSITY MANAGEMENT

All of the four obstacles mentioned above may be discussed by all stakeholders of the universities, but even if they were to be agreed on by university management, it is a long way to go until they will be successfully implemented. There are various hurdles to overcome, not least of which is the traditional freedom and independence of university employees.

Therefore, if any of the obstacles discussed above is supposed to be overcome, special attention must be paid to how the envisaged solutions are to be

implemented. Unlike in industrial enterprises, there is no hierarchy at a university that could guarantee to pass a strategy from top management down to the working level. There seems to be a need to develop professional leadership, based on academic traditions that could be inspired by structures and culture in the private sector.

Even in the attempt to gradually improve some of the issues discussed, several specific measures combined with communication activities have to be undertaken in order to achieve the expected results — this may also include a further development of the university's governance structure.

REFERENCES

- Weber, L. E. & Duderstadt, J. J. (eds). (2004). *Reinventing the Research University*. Economica, Paris.