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UNIVERSITY STRATEGIES FOR KNOWLEDGE TRANSFER AND COMMERCIALISATION

An overview based on peer reviews at 24 Swedish universities 2006

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About VINNOVA

VINNOVA, Swedish Governmental Agency for Innovation Systems.

VINNOVA´s mission is to *promote sustainable growth*
by funding *needs-driven research*
and developing *effective innovation systems*.

Through its activities in this field, VINNOVA aims to make a significant contribution to Sweden´s development into a leading centre of economic growth.

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Research and Innovation for Sustainable Growth.

University strategies for knowledge transfer and commercialization

An overview based on peer reviews at 24 Swedish universities 2006

by

Christina Johannesson

Foreword

VINNOVA (The Swedish Governmental Agency for Innovation Systems) launched the Key Actors Programme in 2006. The programme aims to strengthen the role of the universities as engines for renewal and development of business, enterprise and society in Sweden. The long-term goal of the programme is to contribute to the development of skills, methods and structures to make universities in Sweden more professional, with regards to cooperation with enterprises and other actors in the surrounding society, as well as in valorisation of knowledge and commercialisation of research outcome; i.e. all aspects of what is usually referred to as "Knowledge Transfer".

The programme started with an invitation from VINNOVA to the universities to perform a self-assessment and a peer-review of each university's knowledge transfer and commercialisation activities, according to guidelines provided by VINNOVA. The results of the self-assessments and peer reviews were not required to be reported back to VINNOVA, but were considered to be used by each university for its own strategic development and as the basis for applying to the programme´s first call.

In total 24 universities and university colleges responded positively to the offer. The consultancy firm FBA Holding AB was given the commission to be process leaders in all peer review dialogue. When the peer reviews had been completed VINNOVA also asked FBA to summarise general findings and conclusions from these dialogues.

This report is thus based on the universities own self-assessment reports and the peer review dialogues and reports.

Results or findings originating from any specific university are not included in this report. The summary and the conclusions are made by the author, and do not necessarily reflect the position of VINNOVA.

It is the hope of VINNOVA that the content in this report will serve as inspiration for further discussions and actions in this area.

VINNOVA in September 2008

Susanne Andersson & Anne Lidgard
Programme Management of The Key Actors Programme

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1 Introduction

1.1 The Key Actors Programme

As part of VINNOVA's Key Actors Programme, the majority of Swedish universities and university colleges (henceforth referred to as universities) were offered support to perform a self-assessment of their knowledge transfer and commercialisation activities. This assessment included a peer-review of each university's knowledge transfer and commercialisation strategies as well as of the systems supporting innovation and entrepreneurship. In total 24 universities responded positively to the offer, and underwent such assessments in 2006.

As process leaders in all the peer-review dialogues, the consultancy firm, FBA Holding AB, was commissioned to summarise the status of collaboration and commercialisation at Swedish universities. This was to be based on the universities' self-assessment reports and the peer-review process, which included presentations, interviews, and reports.

1.2 The collaboration task

The universities' collaboration task, formerly known as the "Third Mission" in addition to research and education, is quite broad. In this report, as well as in the Key Actors Programme, the scope of the third mission will be limited to the universities' activities with relevance to innovation and growth. This means primarily knowledge exchange and collaboration between the academic sector and the business sector and/or the public sector, in which the aim is to develop and use research and research-based education to increase the competitiveness of Swedish trade and industry. The wider objective of collaboration where democratic and adult education issues are addressed is not included.

This report may serve as a baseline for monitoring and evaluating further development of Swedish university strategies concerning collaboration, knowledge transfer and commercialisation. It especially analyses the current challenges the universities face and need to overcome as well as the areas they need support to become successful.

1.3 General critical factors

When the peer dialogues were completed in September 2006, it turned out that the critical factors high-lighted by the peer group was very much the same among the participating universities, independent of a university's

size, history and profile. This summary is an attempt to illustrate what struck the peer group[1] the most, and to point out the general areas where development is necessary, especially for universities aiming at international recognition and competitiveness.

In this summary, the language is forthright and may seem provocative and biased. It is problem-oriented and focuses mainly on issues where the universities in general fall short. There is no doubt that individual universities and individual departments are more accomplished than the general university profile described in the summary. However, the purpose is to emphasise critical issues. In the full report, hopefully the reader will find a more detailed picture, where divergences and successful efforts have been illustrated as well.

1.4 Layout of report

The summary follows the same structure as the report, illustrating the universities' situation regarding four questions.

- *Why* collaborate?
- *Who* should or is collaborating?
- *What* to collaborate on and *when*?
- *How* to collaborate?

The authors of this report have proposed a *strategic development theme* after each section in the summary. This relates to the scenario described in each section.

[1] All of the universities were visited by a group of international and national experts, i.e. the peer group. On site, they met during two days with university management, professors, students and external stakeholders, in order to make an assessment of the collaborative task of the university. FBA Consulting served as the process leader during all of these sessions.

2 Why collaborate?

2.1 Collaboration is considered to be a strategic path for a university to attain its vision

There is no doubt that the universities are aiming high; to be "nationally leading and internationally recognised" is the most common phrase for their ambitions. Collaboration is looked upon as a strategic tool in this context. It is based upon the following assumption:

Collaboration can increase the quality of research and education with respect to its relevance for society, which hence contributes to an increased economic growth. This can in turn increase the understanding of the importance of the university's role and as a result attract additional economic resources to the university. A wide range of strategic management documents subscribe to this logic.

However, the peer group was given the impression that the universities are suffering from insufficient and decreasing economic resources. Some of the underlying causes are a reduced share of *government subsidies*; a decreasing number of *students* (mainly in natural sciences and engineering); a very small or a decreasing amount of *co-financing and commissions* from the business sector; and finally, a weak financial situation for the universities' holding companies with very few successful *exits* so far.

On one hand, universities consider collaboration strategic to reach their vision and claim that the numerous strategies and policies have made collaboration mainstream and a well-integrated tool in the performance management at all levels of universities. On the other hand, it would seem that this logic of attracting more funds has not yet lived up to its promise.

The peer group draws attention to the fact that university managements run the risk of experiencing a long-term mismatch between ambition and resources. The group rarely found any measurable goals, management systems, staff incentives, or other signs of attempts to efficiently operationalise the collaboration strategy.

Currently, collaboration in general and commercialisation in particular is regarded first and foremost of interest to the researcher, rather than an opportunity for the university. Hence, the innovation support system is organised in special units or projects oriented towards the researchers and with non-transparent connections to the university's vision and economy. The "Professor's Privilege" gives a researcher the full right over his/her research and prohibits Swedish universities to commercialise research

results unless an agreement is made with the researcher. This is a common excuse for the lack of strategies and involvement by university management.

The wide range of documents governing knowledge transfer seem to be more a result of the Government's demand for strategies than a real awareness about the concrete links between a university's vision to keep and develop an international front position and the different aspects of collaboration. Furthermore, as a result of the lack of measurable milestones and indicators, there are very few examples of routines for follow-up and self-assessment of collaboration outcome. The whole logic of "competitiveness through collaboration" seems very much in its early phases.

Regarding the university's role in the (global) knowledge economy and the clear international ambitions stated in almost every university's vision, there are obvious reasons for updating and revising the strategies for collaboration and managing the innovation support system.

Proposed strategic development theme

To clarify and manage collaboration and commercialisation as strategic issues contributing to the university's vision and long-term economy.

3 Who is collaborating?

3.1 In the current situation, it is difficult to understand the extent and nature of collaboration

The university managements claim to have a strong commitment to the field of knowledge transfer and commercialisation. They portray that there are many (potential) collaborating partners to be found both internally and externally. However, deeper investigation of these potential partners seems to lead to a different conclusion, that perhaps these partnerships are not as solid as claimed. Regardless of what kind of inquiries, dialogues and "evaluations" that are used, the information does not seem to be documented, structured, validated or circulated, to serve as a tool for a university's interaction and selection of strategic stakeholders. As a result, the knowledge about collaboration and who is accountable for what is rather ad hoc.

3.2 The individuals right rather than the universities' opportunity?

Collaboration and commercialisation are in practice primarily managed as an individual researcher's right and opportunity rather than a strategic tool for the university as a whole. As a consequence, the universities in general do not track and evaluate collaboration and commercialisation, but leave that to whichever unit that has assisted the researcher in the commercialisation process, e.g. the knowledge transfer unit, the incubator, the holding company, or science park.

The different departments at the same university cultivate their own interests, which leads to different cultures, different requirements, and also to varying degrees of professionalism concerning consulting, mobility and other aspects of collaboration.

3.3 Strategic business alliances are not identified

Regarding the business sector, the same picture stands out. The lack of strategic recording of private or public sector partners (names, size of contracts,) etc. is alarming. Analysis of benefits, problems, favoured market segments and so forth, i.e. a strategic analysis is in most case non-existent. Furthermore, the only assessment of external partners' satisfaction is tied to evaluations of specific research projects or commissioned education.

Corporate funding accounts for less than 15% of the total funding of the university research and postgraduate education divided into collaborative research (6.5%) and commissioned research (8%). Direct Government funding and public funding from Swedish research councils, foundations and agencies still account for the major part of the total funding, even though everything but direct Government funding is called “external funding”.

The lack of strategy to attract business alliances is surprising since the external (business) financial contribution is low and for some universities even decreasing, while at the same time, it is regarded as crucial for the university’s long-term survival.

3.4 Student collaboration – a duty more than a strategic benefit

It is a fact that student enrolment is low in many programmes, especially in natural sciences and engineering. At the same time, the students request more and more opportunities for interaction with the outside world during their studies. However, students’ needs, opinions and external activities are evidently not a common item on the vice chancellors agenda. If at all, they are handled by the student unions, student career centres and alike.

Moreover, the non-existent use of alumni is striking. Although many alumni are likely to hold strategic positions in the industry and the public sector, they are not identified as potentially, interesting partners. Students seem to be of interest to the university only during studies, when they are adding a certain economic benefit to the university[2].

Of course there are exceptions, but student collaboration often seems to be a result of tradition in certain departments and programmes. In others, it has become an imperative following the Bologna process, rather than an implementation of the university’s strategy to increase its attractiveness, based on student needs and preferences, and thereby strengthening the university’s financial base.

3.5 A lack of international profile and interface

The partnership approach at the university level is rather extensive. All universities organise or take part in one or more partnerships where the members develop ways to collaborate with society at large. However, the contacts and the relationships are mostly regional, very few are

[2] In the Swedish system, part of the university funding is based on the number of students actively enrolled.

international. Note that academic collaboration, which may have a higher international profile, has been excluded here in the underlying statistics.

Regarding the business sector the picture is the same, with a minimum of foreign businesses and EU projects involved, if any. Only 1.5% of the total research and research education funding comes from foreign companies and 3.5% from the EU. When foreign students are concerned, although they are not allowed to stay in the country after finishing their studies, they are not even identified as strategic alumni, having the potential to establish crucial cross-border contacts.

Consistently, in all the peer reviews, the peer group pointed to the weak international interface, finding it contradictory to the universities' high ambitions about international recognition.

Proposed strategic development theme

To identify strategic stakeholders, internally and externally, and to develop and evaluate incentives, outlooks, relationships and interactivity in light of the university's vision

4 What to collaborate on?

Collaboration is about mutual benefits, where a university contributes to society at large and vice versa, illustrating the idea of a two-way relationship. The university develops relevant research inside the university and effective application of the research takes place outside.

4.1 A lack of clear profiles and "customer focus"

In general, the lack of clear profiles and marketing to facilitate contacts and make collaboration more advantageous is evident. Furthermore, less than 40% of the universities claim that they have made needs-inspired prioritisations of research in collaboration with public or commercial partners. It seems that most universities use the profiling more as headings and a way to sort what has been done, rather than to actively select or decline research areas.

In addition, the decentralised, or even individual, responsibility for collaborating activities and commercialisation might lead to non-transparent conditions for potential partners. In turn, this could affect the actors' interest and the university's image negatively.

One can readily conclude that there is a general lack of "customer focus". It should also be mentioned that some even claim that this is the right way to run a university, based on the ideas of universities traditionally offering all disciplines and the researcher's inviolable integrity.

4.2 The various methods for knowledge transfer and collaboration are not easy to identify or to follow up

In this report the universities' ways to operate knowledge transfer and collaboration have been divided into six categories:

- *collaborative research,*
- *commissioned research,*
- *commissioned education,*
- *undergraduate education*
- *postgraduate education, and*
- commercialisation support

This is however a theoretical description. In practice, it is only possible to make a very rough assessment of which category that is the most

widespread or which is the most profitable, in order to compare the universities with one another. The ways to delimit, to budget and to follow-up the different categories vary tremendously. Even when there are available statistics, there are obvious discrepancies, for instance, between the national statistics and the self-assessment reports. There are also inconsistencies between how highly prioritised a category is (according to the strategy) and the real outcome.

In general, a university does not have access to income from patents and other intellectual property rights (IPR) or spin-offs due to the aforementioned “Professor’s Privilege”. As a consequence there has been no legal basis for registering contracts or corresponding information in the accounting system, which, in turn, complicates or hinders monitoring and tracking commercialisation pursuits. The data given in the self-assessment reports fully illustrate the problem. Different time periods and subjective approximations prevent a satisfactory portrayal of the commercial activities.

It should be mentioned that there is yet another broad category of collaboration, which can be termed “consultancy services”, whereby individual researchers are engaged as experts, investigators, lecturers etc. These services may be performed as consulting services, as part of a project or for free, and are even more difficult to trace as part of the university strategy or in the accounting system, which is why they are not addressed in this study.

4.3 Indirect commercialisation may be less exploited than direct

In the budget proposals for 2007, the Government established that there is extensive collaboration between the academic world and surrounding society, but that there is still a lack of transforming highly qualitative research and patents into new and growing companies. This may seem contradictory to the fact that the innovation support system is strongly oriented towards commercialisation through new ventures, more than other kinds of collaboration.

The reasons may be that the researchers are more willing to give away research results to the collaborating company in exchange for more project funding, while the universities’ innovation support systems often focus on “making entrepreneurs out of researchers”, although not finding many who are willing to play that role. Less emphasis has been on licensing and other commercialisation support in research collaboration projects as compared to the start-up track. Furthermore, other options using incubators and other arenas to attract existing companies, entrepreneurs and venture capitalists to exploit innovative research, are seldom used.

4.4 Fostering collaboration through students

In general, student enrolments are high and rising in areas and programmes where the industry's co-financing is low (humanities and social sciences), and vice versa. Most universities attempt to solve this dilemma by offering undergraduates and postgraduates links to working life experience and real life problems. The universities also offer entrepreneurship education and training. The purpose is two-fold. One is to make all education relevant to young people and their demands. The other is to foster the industry's interest in recruiting well-educated people and in co-financing academic work in all areas.

However, not all universities offer these opportunities to all students, and less often to PhD students than to undergraduate students. Moreover, different departments have their own principles and ways of finding internships and thesis/research subjects. This may be troublesome for the individual student if he or she has to make many contacts without support from the university to find a relevant subject or company.

Proposed strategic development theme

To establish clear profiles and portfolios, and find ways of developing professional support for collaboration initiatives, as well as evaluation processes, bearing in mind the complexity of collaboration and commercialisation, including potential conflicts of interest.

5 How to collaborate?

In earlier sections, we have illustrated collaboration in a broad context. Here we focus on the commercialisation process and the innovation support system, which can be described as both an organisation and a process.

5.1 The organisation: non-transparent, complex and with few people

Organisationally the system can be divided into three types of units.

- *In-house expertise units* – are typically knowledge transfer offices, dealing with contacts with surrounding society for funding, collaborative research, commissioned education etc.
- *Commercial units* – are incubators and holding companies, and
- *Cross-border units* – are science parks, public private partnerships etc.

Most of the universities have made efforts to gather and centralise different kinds of support, for instance, external relations, commissioned education and research marketing, career services, IPR issues. Still, the assortment of units and their overlapping functions are numerous. The situation seems to be complex and hard to see through, both for internal and external parties.

Despite the great number of units, rather few people are employed in the innovation support system and many of them only part-time. The wish list of people is both extensive and expensive. Therefore, the number of staff is quite limited compared to the expected work-load and outcome, which means a need for multi-talented people, who are not easy to find. The innovation support system is accordingly not only non-transparent but also under-staffed in relation to the extensive work-load.

To compensate for the deficit, some innovation support systems rely on other universities' resources, especially when business law and IPR matters are concerned. But, even if almost half of the universities consider the infrastructure as a whole to be insufficient and express the need for a stronger innovation support system, they do not turn to their own faculty colleagues representing both legal expertise and entrepreneurial/business oriented competence and skills.

5.2 The process focuses on the early stages, however the reason is not fully justified

The overall aim for the process is to provide a path for the transfer of research to market. The support is about preparing the participant to be able to introduce his/her service or product to the market, and/or to obtain financing for projects that require more time for commercial take off. A general description of the process is: *scouting*, *screening*, *IP management*, *proof-of-concept* and *commercial development*, i.e. a process from action plan to pre-seed to preparation of external financing and exit. Besides the supporting process, the universities also offer courses and competitions and also aim to strengthen the interest in commercialisation and entrepreneurship among university staff and students.

Most universities target the early stages, until the proof-of-concept step. The main reason is to not intervene with market forces for commercial development. However, it can also be a result from lack of financial resources and competence, and from the fact that the process is rather recent and the kind of support offered has not yet experienced the later phases.

Few researchers and students know whom to turn to and why. Some even criticise the innovation support system for being too weak, lacking in substance and means. No more than a hand-full of universities can be regarded as being “on the top” professionally, i.e. covering the whole value chain from scouting to profitable exits.

5.3 Physical sciences are more clearly addressed than the social sciences

Some researchers may consider the commercialisation process not relevant to their research field. For example, the innovation policies and the measurable goals for innovation often pick up expressions from the physical sciences (patents, products) making it hard for the social sciences to apply a similar policy on its activities.

This in turn, results in difficulties for researchers and students to identify with the strategies and goals. In addition, it leads to researchers alienating themselves from the policies as being without relevance to their daily work. It also results in focusing on creating product-based companies and paying less attention to fostering service-based companies, with possible negative effects for a region’s growth and business competitiveness.

5.4 Males are more involved than females

The group of people interested and involved in commercialisation is both heterogeneous and homogeneous at the same time. The age range is quite

wide and there is an ethnic diversity hardly found in society at large. However, the commercialising researchers are mostly men. Men between 35 and 50 years of age, who are well-recognized scientists, in technical or medical sciences, dominate the commercialisation arena. Just a few universities state that they are working with commercialisation strategies in the light of gender equality, i.e. to especially attract and support women in entrepreneurship and commercialisation issues.

Finally, some draw attention to the fact that actual investments run a risk of being too concentrated on new business start-ups. The view is that the universities must continue the work of maintaining relations with existing companies and value the extent to which companies can incorporate research and results from student projects.

5.5 A wish for a more professional view

There seems to be equal number of people who support as well as oppose the “Professor’s Privilege”. Common though is the demand for a significant strengthening of the university organisation, to be able to handle the complexity in supporting and reporting collaboration and commercialisation.

At all the universities, some raise the issue that the collaborative and commercial needs and demands are allowed to influence the research agenda too much, threatening researchers integrity and outrivaling curiosity-driven research and true innovations. The problems, so far, are considered small and are mostly dealt with on a case-by-case basis. But, a stronger focus on commercialisation as an outspoken expectation from the Government and the university management is expected to increase the risk for more pronounced conflicts, especially regarding the individual researcher’s principles for allocating time between research and commercialisation.

Many also point out that the academic merit system does not offer enough incentives to collaborate. Or, put in another way, industrial merits don’t really weigh as much because guidelines for recruitment, career and salary negotiations are quite different. If the academic meriting system continues to focus on the number of traditional publications, the researchers will carry on focusing on non-collaborative research.

Further development of the innovation support system and the collaboration and commercialisation processes are apparently of great interest to the universities. Many universities have taken the time to explain their views regarding developing issues. The issues have different outlooks, including policy implications and university undertakings.

Proposed strategic development theme

To make the innovation support system transparent and suitably staffed, and the processes professional and relevant to all kinds of ideas and stakeholders.

Appendix

Performance Assessment of Knowledge Transfer and Commercialisation Activities at Universities

Instructions and Questionnaire

Summary:
Modular self-assessment methodology

VINNOVA provides the following methodology for the assessment of the performance of knowledge transfer and commercialisation activities at universities. In this context **knowledge transfer is defined as bidirectional**, meaning that the flow of information/activities could go either from university to industry or vice versa:

The assessment takes place in three modules. The first module is a self-assessment questionnaire that the university fills out. The information compiled from this is qualitative and mainly forward-looking. To complement it, there is a shorter facts and figures module. Together, these modules constitute a background for a peer-review.

In the peer-review, national and international peers visit a university to delve deeper into issues that the university, as well as the peers, judge meaningful for its knowledge transfer and commercialisation activities. The peers meet with the university management, staff working with knowledge transfer and commercialisation and other people internal or external that contribute to a greater understanding.

The main objective of this approach is to promote discussion and teamwork around the issue of knowledge transfer and commercialisation at the university. Data will not be used for ranking purposes.

This document begins with instructions for how to fill in the self-assessment and the facts and figures parts. After that, it is divided into three parts, in accordance with the modular approach. The first part consists of the self-assessment and the second details which facts and figures that should be gathered. The third part, the peer-review, does not contain any set questions, as the university together with the peers decide on what to specifically discuss on basis of the self-assessment questionnaire and other types of information provided.

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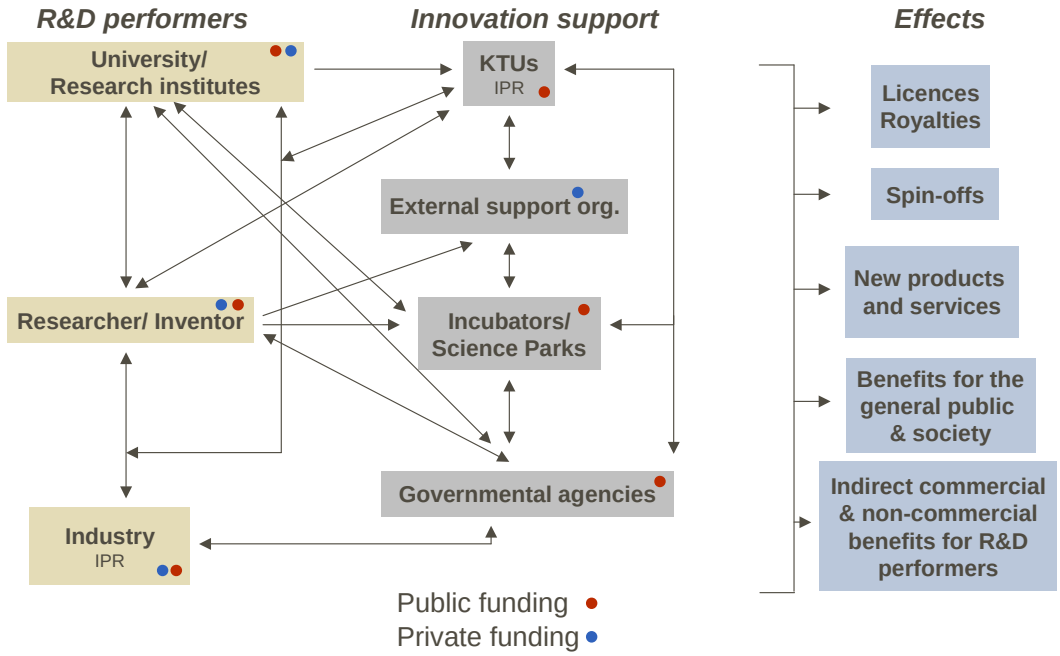
Instructions



As the above figure shows, knowledge transfer and commercialisation is a complicated, non-lineal system, involving many actors and double-ended connections. The assessment mainly concentrates on the activities of universities.

As there are many differences in the way Swedish universities handle knowledge transfer and commercialisation, **the questions are generic**. Chances are that they do not fit perfectly with the conditions of any specific university. When answering, **try to look for the rationale behind the question and then give an answer according to what suits your organisation**. Likewise, solve uncertainties about definitions by using the definition you prefer, and note the reasoning behind your choice.[1]

The self-assessment module should **not be longer than 25 pages** when completed. All questions should be considered, but the significance given to questions is up to you. **Consider the aspects that you believe will form the best background for a meaningful peer-review session and concentrate on them**.

[1] Background material to the peer-review may consist of more than the self-assessment and facts and figures (see **III-Peer-review** interviews). Important information that is not covered in the self-assessment may be added there.

The questions are not designed so that one person can answer them all. **Answering the questions will demand the involvement of several people, at different levels of the organisation**, and will encourage communication and teamwork, to prepare for the peer-review.

When answering, please **take notice of gender and minority issues**.[2] There are some specific questions that deal with these, however the topic should be born in mind for all areas that are covered.

[2] Examples of such issues are: gender competence, distribution of men and women within types of positions, strategies to increase diversity etc.

I Self-assessment

These are open questions. Please develop your answers as you consider appropriate for your organisation. A maximum of 25 pages is allowed for your response to the self-assessment. If you wish, you may change the outline of the response. Some questions may be answered under one heading; all questions should, however, be considered in the response document.

I.I Strategy

I.I.I Strategy and goals

Do you have clear goals for knowledge transfer and commercialisation? Please describe.

Do you have a prepared strategy describing how to achieve these goals? Please describe. Is it clear how to execute this strategy?

Are gender- or minority perspectives included in the strategy? If yes, in what sense (for example distribution of performers/ users, changing of attitudes, directed actions, gender competence, etc)? Please describe.

Do you follow up on strategies/ goals? If yes, please describe how.

In what way is your work with knowledge transfer and commercialisation effecting education and research (i.e. “the first and second mission”)?

Who (or which persons) are responsible for the overall work with knowledge transfer and commercialisation at the university? Who (or which persons) are responsible for executing activities?[3]

How do you communicate your strategy and activities within the organisation and externally? Please describe.

Given the overall vision set for the university, does work with knowledge transfer and commercialisation give rise to conflicting interests? If so, how is this handled?

I.I.II Knowledge transfer and commercialisation profile

Questions directed to specific units for knowledge transfer and commercialisation (if any) such as holding companies and/or incubators.

[3] Position (s) and name(s).

What/ which types of knowledge transfer and commercialisation activities are prioritised? What is your reasoning behind your priorities?

Do you focus your activities towards a specific area (a specific sector, products/services, region, etc? If yes, what are the reasons behind your choice?

Do researchers and other employees that are active in the field of knowledge transfer and commercialisation constitute a homogenous group (gender, age, ethnicity, research area)? If yes, are there attempts to broaden this group, and if so, how?

I.I.III Learning and future strategies

Do you have ambitions to develop your knowledge transfer and commercialisation activities during the coming years? If yes, how?

Do you have a strategy to increase the number of research projects with a commercial potential? Please describe.

Do you work actively with self-assessment of your activities in knowledge transfer and commercialisation? If yes, how?[4]

How do you plan to work with stakeholder satisfaction (researchers, external collaborators, etc) regarding activities in support functions (Holding companies, incubators, etc) in the future?

What do you envision as a crucial change in the innovation infrastructure, nationally or regionally, that would strengthen your position/ capability/ activities?

I.II Attitude and legitimacy

I.II.I Management and general university attitudes

Does your organisation have discussions about industry co-operation and commercial activities at the executive level (university leadership)? Are there discussions about ethical implications etc?

Is the university leadership aware of researchers' and students' attitudes regarding industry co-operation and other commercial activities? If yes, are there regular assessments?

[4] For example by using best practices, bench learning, networking etc.

Is the university leadership actively working with attitudes and behaviour related to innovation and commercialisation at various organisational levels within the university? Are there:

- specific training in knowledge transfer and commercialisation for students/ researchers (entrepreneurship, etc)?
- clear incentives that promote work with knowledge transfer and commercialisation?
- other activities?

If clear incentives exist, how are they constructed (for example monetary rewards, additional qualifications in promotions, positively affecting appointments, etc)?

How do you plan to work with attitudes related to knowledge transfer and commercialisation in the future?

I.II.II Mobility

Is it common that university employees have temporary positions outside of academia? Please describe.

Is it common that industry employees have temporary positions within research- and/or educational activities at the university? Please describe.

Are there development activities regarding human resource policies (personnel politics) to promote knowledge transfer through increased mobility?[5] Please describe.

Do you offer students sandwich courses and industry internships organised by the university? Please describe.

Are there postgraduate students directly sponsored by industry? How many are they in relation to all postgraduate students? Please describe.

I.III Processes for knowledge transfer and commercialization

Common examples of how knowledge transfer and commercialisation activities are organised are as separate legal entities, such as holding companies, incubators etc, or as units within the university, such as a external affairs/ corporate liaison office.

[5] New types of positions, incitements, merit-earning systems etc.

I.III.I Infrastructure and operations

How is the work with knowledge transfer and commercialisation organised at the university? Ownership? Various units and their relation to each other?

What activities are provided to promote/ develop knowledge transfer and commercialisation?[6]

Which activities are the most demanding in terms of both labour and costs? If possible, please rank the activities.

How do you work with identifying research projects with commercial potential?

Do you consider that you have access to a strong infrastructure (including financing) regionally or nationally for your unit/ activities?

What competencies have the staff working with knowledge transfer and commercialisation? Are their competencies sufficient? Is there regular competence development of the staff? Is there a gender perspective regarding staff/ competences?

To what extent do you need external support for your activities? What type of support is most common? Please describe volume, actors, etc.

How do you manage and control licenses, options and royalties?

How do you control and evaluate equities in spin-offs?

What is your general exit strategy for companies that you have invested in?

I.III.II Stakeholder satisfaction

Do you, on a regular basis, investigate how stakeholders perceive your knowledge transfer and commercialisation activities?[7]

If yes, what is satisfactory/ less satisfactory? Are there differences among various groups of stakeholders regarding their satisfaction with your services/ support?

[6] E.g. inventory of research projects with commercial potential, advice on route of commercialisation, match-making, business proposal evaluation and development, due diligence, marketing analysis, management support, financing (internal/ external), legal advice, training of researchers and incubator services etc.

[7] As stakeholders we refer to persons and organisations that use the knowledge transfer and commercialisation activities. These include both university employees but also existing companies and other organisations.

I.IV Co-operation activities

I.IV.I Links to the surrounding society

How do you work to support the establishment of networks with the surrounding society?

Do you co-operate with other universities regarding knowledge transfer and commercialisation activities? Please describe.

Do you have access to regional/ national/ international initiatives (various organisations) in the area of university-industry co-operation? Please describe.

How do you market your knowledge transfer and commercialisation activities externally? Please describe.

I.IV.II Research co-operation and consultancy/ advice

To what extent do researchers at your university engage in contract research, provide consultancy/ advice with external organisations or commissioned/ professional education?

Is it possible to discern a specific profile for research co-operation, consultancy or commissioned/ professional education?

- type of research/ consultancy
- partner organisation (firms, industrial associations, government agencies and other organisations)
- project scope (length, budget etc.)

Does the university provide, or plan to provide, support to researchers in matters of research co-operation, consultancy or commissioned/ adult education etc.? Describe.

I.V SWOT – strengths, weaknesses, opportunities and threats

From a future perspective and based on your response to the self-assessment, could you please make a short SWOT analysis (a maximum of ten statements for each area) regarding your capacities to work with, and to develop, industry collaborations and commercialisation of research results?

II Facts and figures

II.I Background information

Please note data per year from 2001 to 2005

II.I.I University type

Faculties (or units) and particular profile(s) if applicable

Number of students divided per faculty (full-time equivalents)

Number of post-graduate students divided per faculty (full-time equivalents)

Number of employees per faculty (full-time equivalents)

Number of researchers with a Ph.D. degree divided per faculty (full-time equivalents)

Number of employees working in specific units devoted for knowledge transfer and commercialisation (full-time equivalents)

Number of employees that work with knowledge transfer and commercialisation *outside* of specific units [8]

II.I.II Funding

Total turnover at the university

Total R&D funding per source of financing:

- direct governmental funding
- targeted public funding (public agencies, research councils and research foundations)
- industry, including private research institutes (Swedish and international) [9]
- others (municipality and county council, EU, own foundations and funds, Swedish and international non-profit organisations, etc)

Estimation of the total funding from industry divided in large corporations, SMEs and spin-offs from the university and private research institutes [10]

[8] Definitions are noted in Appendix 1: Knowledge transfer work.
[9] Note: research institutes include for example IVF AB, SICS AB, SITI AB and STFI-Packforsk AB.

Income from contract as well as collaborative research distributed by actors/unit, volume in SEK and expressed as percentage of the total R&D funding [11]

Income from commissioned/ professional education distributed on actors, volume in SEK and expressed as percentage of the total funding for education.

Total turnover for knowledge transfer and commercialisation activities [12]

II.II Commercial effects

Please note data per year from 2001 to 2005

II.II.I Intellectual property rights

Are, on a regular basis, statistics established regarding the commercial effects of the university (innovations, patents, licences, etc)?

Number of patent applications in Sweden, EU, USA and other countries [13]

Number of approved patents in Sweden, EU, USA and other countries

Number of commercialised intellectual property rights, except patents:

- trade marks
- protection of designs
- copyright
- protection by legal contracts

The university cost for handling intellectual property rights

II.II.II Licensing

Number of approved licences.

Income from licences/ IPR.

[10] Total industry funding comprise both Swedish and international companies. Large companies are defined as companies with 250 or more employees, SMEs as companies with less than 250 employees.
[11] Public authorities and organisations, other universities, Swedish and international companies and others.
[12] Interpret as you find appropriate – define what is described and please motivate your choice.
[13] Relevant organisations: Sweden – PRV, EU - EPO and USA - USPTO.

II.II.III Spin-off companies

Note. *Some of the following questions presuppose that the university has a holding company or other legal entity that would allow owning IPR (intellectual property rights). If this is not the case, the question should be ignored.* ***These questions are marked with an asterisk ****

Number of spin-offs established[14]

Number of the above spin-offs that were still active December 31, 2005

Number of employees within these spin-offs

Total turnover within these spin-offs

Number of cases where the university has equity in these spin-offs *

Estimation of the total value of the commercial assets in spin-offs of the university *

Income from “exits”*

Place of localisation of the spin-off companies. Percentage of the total number of companies for each year during the period 2001-2005:

- regionally (define the region)
- in Sweden (excluding the region)
- outside Sweden

II.II.IV Other commercial effects

Number of contracts with external partners

Estimation of income from consultancy and similar activities (that are reported to the university or channelled through a specific unit at the university)

How reliable do you consider to be the data provided for commercial effects?

How relevant do you consider to be the data provided for commercial effects?

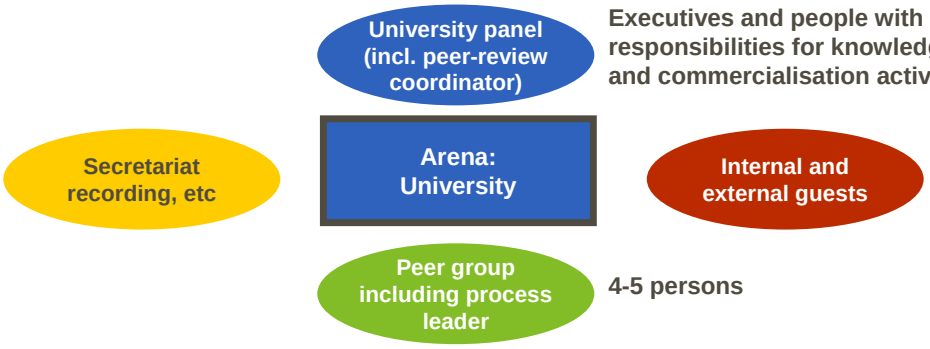
[14] Spin-off companies are, in this document, defined as newly started companies with at least one of the founders employed at the university and that are based on the research activities at the university.

III Peer-review interviews

For a comprehensive performance assessment of a university's knowledge transfer and commercialisation activities, a peer-review like process will be carried out to identify their capacity and effectiveness, and to assist with future development. The process will be based on the responses in the self-assessment, on facts and figures, and on other relevant material.

III.I A general peer-review process

The peer-review group should consist of four to five persons representing various expertises in the field of knowledge transfer and commercialisation. Ideally the group should consist of well renowned academics, practitioners, industrialists and other relevant competencies that form a team of peers complementing each other. Preferably, some of the peers should be international experts. The profile of the university should also be taken into account when selecting peers.



Basic material for peers:

- The self-assessment survey
- Any other type of information that the university finds appropriate
- Charts of organization for knowledge transfer and commercialisation operations
- Themes for the peers

At least 10 days in advance

Site visit schedule:

Evening before peer-review

- Pre-meeting between peers, process leader and university coordinator

Day 1-2

- Basic material
- Guests – internal
- Guests – external
- Peer-contribution/ discussion

After site visit

- Secretariat submits material to peers
- Peers submit key-note report to university

The university (with support from VINNOVA) will select the peer review group. It will be headed by a process leader/ moderator, chosen by VINNOVA. From the university, a panel of executives and persons with responsibilities for knowledge transfer and commercialisation will primarily

be involved in the discussions with the peers (although additional staff/ students could also be involved in the interviews). A central person should be identified to coordinate the university's planning and execution of the review. The university should provide a secretariat with persons responsible for recording and assisting the peer-review process. The secretariat is also important in assisting the peers in writing the keynote report to the university. The secretariat may also include one or more external observers to support the process.

During the peer-review, internal guest (selected by the university/ peers such as senior faculty members, department heads, researchers, students, etc) and external guests (persons from industry or other external organisations that have been or are co-operating with the university) should be included in the interviews.

The peers will, for their preparation need basic material describing the university. The university's response to the self-assessment (including facts and figures) is very important and intended to constitute the main background material for the peers.

The university may provide additional material relevant to the process (results/ reports from other surveys, specific projects, activities that are in progress, planned new initiatives etc), but this material must be restricted to a maximum of 30 pages.

Themes of particular importance for the peers (depending on the university, profile, activities, etc) during the review will be discussed in advance. A central theme of all peer-reviews is how the university can develop and be more effective in its activities concerning knowledge transfer, commercialisation and co-operation with industry/ society based on a thorough analysis of the present situation.

The peer-review site visit is typically planned to last for two full days. If the university is very small, the schedule may be shortened .

The peer-review schedule will essentially be run as shown in the figure, starting with a pre-meeting the evening before the actual peer-review begins. The pre-meeting should be used to discuss themes, agree on process details and give the peers and others a chance to get acquainted. At the end of the site visit, a few hours should be set aside for the peers to discuss recommendations for future development. After the site visit, the peers will produce a keynote report of about five to ten pages, aided by the notes from the secretariat.

III.II Example of themes

Of particular importance in the peer-review process is the gathering of information about the present situation and future developments. Typical questions for peer-reviewers could be:

- What is your opinion about the performance of your industry relation and commercialisation activities today? Major hindrances/ bottlenecks? Major strengths?
- In what areas do you see the greatest potential of development and opportunities today? What could facilitate this?
- What is required for you to continue developing your work on industry relation and commercialisation activities?
- In terms of resources (personnel, funding, organisations etc.), what are you planning to allocate to your work on industry relations and commercialisation activities? Do you have a strategy for this, or is one planned? How will you implement this?
- If a university knowledge transfer unit exists, do you work together on the development of strategies for improving the effectiveness of the university's industry relations and commercialisation? Please describe.
- To what extent are you prepared for changes in the surrounding "eco system", e.g. changes in the teachers exemption, the number and capacity of holding companies, new streams of funding (operations, access to pre-seed and seed money etc.)?

Appendix 1: Knowledge transfer work

Work with knowledge transfer is defined as conducting one or several of the following activities corresponding to 20% or more of a full-time position:

- Development of new models for co-operation between universities and existing companies – including research institutes
- Exploitation of synergies between universities and research institutes
- Proactive search of new research projects with a commercial potential at universities to increase the deal flow of ideas/projects for knowledge transfer and commercialisation
- Verification of research projects (from a commercial point of view)
- Handling of IP-related questions based on an established IP strategy for the universities (including the establishment of networks between universities)
- Proliferation of an entrepreneurial culture within universities
- Further development of strategies for licensing
- Development of strategies for the creation of new companies based on research projects within universities as well as from institutes and existing companies
- Development of indicators for assessments of the third mission
- Activities for co-operation with industry
- Activities for contract research and legal matters
- Activities for external fund raising

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VINNOVA´s mission is to promote sustainable growth
by funding needs-driven research
and developing effective innovation systems

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