



COMMERCIALISATION
NUI MAYNOOTH
CONNECT + INNOVATE

GUIDE TO COMMERCIALISATION AT NUI MAYNOOTH

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INTRODUCTION

This guide to commercialisation at the National University of Ireland Maynooth (NUI Maynooth) outlines the essential elements of the commercialisation and Technology transfer process that the Commercialisation Office provides. It attempts to answer the most common questions from the research community and to provide a broad overview of some of the key issues we encounter in the commercialisation process.

The aim of our office is to provide a first class commercialisation service to NUI Maynooth researchers, industry partners and other stakeholders, the service including;

- Promotion of a commercialisation culture at NUI Maynooth.
- Protection and management of NUI Maynooth IP.
- Rapid turn-around on negotiated research collaboration contracts.
- Delivery of structured licence agreements with well defined IP terms.
- Marketing of the NUI Maynooth technologies.
- Incubation support for knowledge-based enterprise development.

Please contact us if you are:

- A staff member developing novel IP or you have a commercialisation query.
- A company seeking to exploit our IP.
- A company looking for research partnership.
- An emerging knowledge-based start-up looking for incubation.
- An investor in early stage companies and ideas.
- An individual seeking an executive role in early stage companies.

You will find more details, including NUI Maynooth commercialisation policies and forms and our technologies available for license on our website:

<http://commercialisation.nuim.ie>



COMMERCIALISATION PROCESS

Background

Higher Education Institutes (HEI) have recently been charged with developing a so-called “third stream”, meaning that in addition to research and teaching, the HEI should make exploitation of its research a strategic goal. The process is referred to generally as either “technology transfer” or “commercialisation”.

Universities have always been engaged in knowledge transfer, publishing advancements in knowledge and educating students in the application of such advancements. This process has been one of *open innovation*. The knowledge developed is not proprietary. Commercialisation or Technology Transfer, however, focuses more on the commercial exploitation of such knowledge, with a greater emphasis on its proprietary nature. This makes the new developments or advancements more attractive to industry and adds some commercial value. Proprietary knowledge is often called Intellectual Property.

Irish Government policies on economic growth and maintenance of our recent economic success have a strong focus on building a “knowledge” economy. To remain competitive, they propose a greater focus on R&D spending (both HEI’s and indigenous industry) and a greater focus on building sustainable technology led SME’s. As part of this overall process, science and technology funding for HEI research has greatly increased in recent years. With this comes a greater focus on the exploitation of the research, particularly to benefit the future economic prospects of Ireland. The Irish Council for Science, Technology and Innovation (ICSTI), in conjunction with Forfas, has recently published guidelines for the exploitation of both publicly funded and public-private funded research. Our funding agencies have embraced these guidelines and the contracts attached to research grant awards place onus on us to ensure the research output is exploited as appropriate. It is noticeable that the commercialisation output is now higher on the agenda for many grant awarding bodies and in some circumstances the potential for this activity has an effect on the success of an application for funding.

NUI Maynooth is dedicated to supporting this strategy and we have been ramping up efforts to help commercialise our research efforts (where appropriate). These efforts include supporting the protection and exploitation of Intellectual Property, encouraging links with industry and providing incubation space for campus companies. Please visit: <http://commercialisation.nuim.ie> to view our policies, forms, research expertise and licensing offers.

A brief overview for researchers

Commercialisation of research is very rewarding for all parties involved. From the researcher’s viewpoint, commercialisation offers the reward of seeing their work taken up by a company and turned into a product. Being actively involved in the commercialisation process also provides researchers with a unique opportunity

to gain insight into the commercial process, thus improving the understanding of the workings of the commercial world. The positive spin-off to this is that those researchers who are attuned to the requirements of the commercial world should increase their success rate in getting grants and should also benefit economically from their technology.

The level of involvement required to bring a product to market varies greatly with the invention. In some cases our office works with companies that have been introduced by the researcher and there is already an interest/ intention by the company to take up the research when completed. In these circumstances our office helps with the negotiation and the formalisation of the transfer process (as the company in this case has an active interest and the research is following a defined path there is often little need to deviate from this path to satisfy the company that the invention is viable). In other cases researchers have developed technology in isolation and this requires active marketing input from our office (with the essential backup of the researcher to perhaps enable a demonstrator and help with any technical queries). In each case we will formulate a plan of appropriate action to move forward with the opportunity based on available resources.

Some of the benefits of getting involved in the commercial process include financial rewards for the researcher (see the section on Getting to market) and creating links to industry that greatly benefit the overall research program and NUI Maynooth student education and employment prospects.

Note: Throughout this guide the terms Invention and Inventor include patent rights and all other Intellectual Property rights.

The aim of our office

Our goal is to make the commercialisation of research rewarding for all those involved. We encourage you to contact us if you believe you have made a potential commercial discovery. We can talk through the procedures for protecting the IP and look at how best to maximise the opportunity. It is important that you are aware that any disclosure prior to patenting may seriously affect your chances of getting patent protection. We will assist in deciding the best commercialisation route for any particular discovery and discuss with you the resources that may be required to generate extra income through a successful licence. Whether this is licensing to existing commercial entities or developing a new spin-out, we aim to ensure we offer the best advice based on international best practice and the uniqueness of our particular case.

What is Intellectual Property and who owns it?

Intellectual Property generally refers to inventions and other material which can be protected under patent, copyright and trademark laws. It includes patents, know-how, copyright, trademarks, and service marks.

IP developed by NUI Maynooth staff or students using NUI Maynooth facilities is owned by NUI Maynooth. Please see the NUI Maynooth IP Policy at <http://commercialisation.nuim.ie/researchers/policies> for more details. However research contracts and funding have some influence over ownership.

What are the commercialisation steps?

Fig. 1 on the following page shows how the NUI Maynooth commercialisation process works. The first step obviously starts with you the researcher. New inventions, discoveries or know-how can be created during the research. Following the discovery you will make an initial opportunity/market assessment based on potential applications for your invention/ discovery.

If you consider the IP to have a commercial application we would then advise you to contact our office as early as possible. Initially this will be a phone call or brief meeting. If the discovery shows promise, we will then request an Invention Disclosure form, which captures information on the invention, prior-art and inventors.

Should you have a strong interest in publishing the discovery we will meet to discuss the best strategy in each case and make an assessment as to the potential impact on the strength of the subsequent patent (see the section on Patenting and publishing).

We will then examine the commercial potential of the invention, complete our own due diligence and proceed with protecting the emerging IP if we feel it has value and will not be compromised by a public disclosure. In parallel we will engage with Enterprise Ireland to discuss further research funding and patent funding. The next steps are completion of proof of concept and proof of market of the technology and additional protection of IP in parallel. All of this is discussed in detail later in this guide.

The final step is to decide on a commercialisation strategy and plan, be it to license the technology or generate a new company to exploit the opportunity.

What is an Invention Disclosure?

An Invention Disclosure is the description of your invention or discovery that you provide to the Commercialisation team at NUI Maynooth. This normally follows a top level discussion with our office. If we believe your invention/ discovery is patentable and valuable, then we ask you to complete the Invention Disclosure form. <http://commercialisation.nuim.ie/researchers/guides-documents-and-forms>.

This form captures your details, ownership details, disclosure record, commercialisation prospects and of course the details of the invention and background or prior art. We treat this document as NUI Maynooth confidential. We will contact you within a few days of receiving your Invention Disclosure and if we

see commercial value in proceeding, in most cases we will then submit it to a patent attorney to prepare a draft.

Why submit a Disclosure?

The Invention Disclosure form initiates the process of commercialisation. It is a record of the invention; it allows NUI Maynooth to assess the commercial potential and will be used as a basis for a patent application by our patent lawyers. It is also used to apply for patent funding support from Enterprise Ireland. If public funds were used to fund the research, the researcher is obliged to submit a prompt disclosure and NUI Maynooth are obliged to seek protection if appropriate.

When to submit the Disclosure?

Submit the disclosure after consulting with us and well in advance of any intended submission to a publisher to allow for a timely publishing/ patenting strategy to be developed.

To protect the invention, the patent must be filed prior to any public disclosure. Public disclosure includes publication, oral discussion, posters and talks etc. Submission of a paper for publication generally does not constitute a public disclosure where it is clear that the publishers will keep the contents of the paper confidential during the review process. From Fig.1 (following page) it should be obvious that it is possible to have both publication process and patent process run in parallel (once we can be sure that we can file the patent in advance of publication). *One caveat is that some journals publish an e-abstract in advance of the journal article. If this abstract is “enabling”, then it will constitute disclosure and patent rights are lost.* See the “publishing and patenting” section of this document for more information on this subject.

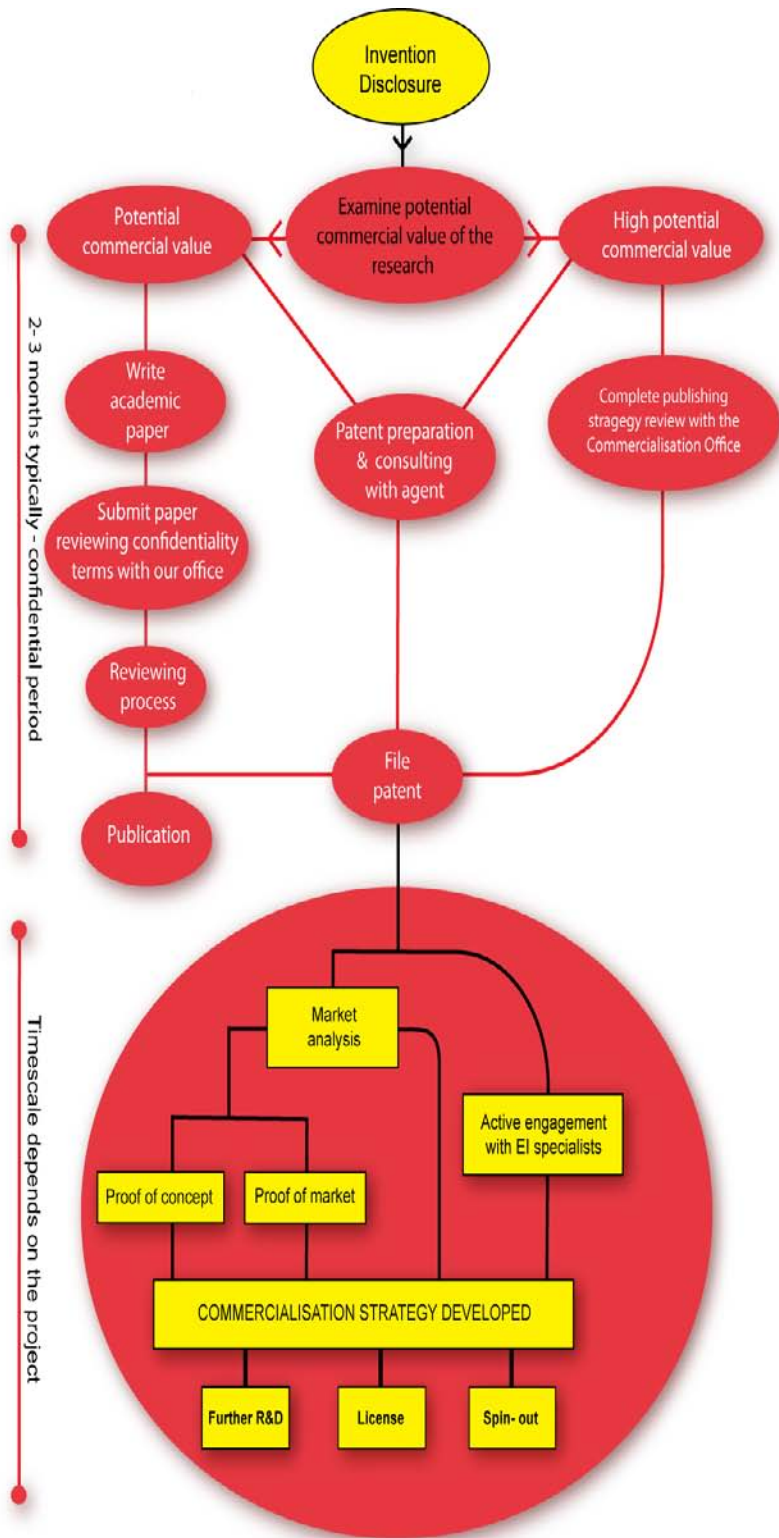


Fig. 1

Who does what in the process?

The table below is a summary of the individual tasks in the commercialisation process and the responsibilities of our office and Researchers. To be successful, partnership is essential. However, we endeavour to reduce the burden on the researcher by removing the majority of commercial and legal steps from the researchers. The entire process can take up to a year to complete all steps, with the input of the researchers varying depending on the invention. It is essential to develop a good demonstrator that can be used to convince industry that the technology works and is worthwhile. This process needs to be carefully managed to ensure that it is compatible with the patenting schedule.

It is becoming more evident that companies are actively looking for realised IP, i.e. IP which has been brought to a prototype stage and can be demonstrated to work. In the Biotech world this equates to lab trials. In ICT this would equate to working prototypes. Having this available greatly enhances the potential for a successful licensing outcome. The time required for this activity should be factored when considering getting involved in this activity.

Commercialisation Office	Researcher	
√	√	Identify commercial opportunity
	√	Complete prior art search
	√	Complete Invention Disclosure
√		Assess commercial opportunity
√		Complete Invention Due Diligence report
√	√	Review of invention with patent lawyer
	√	Assist in preparing patent application
√	√	Review patent application
	√	Develop demonstrator to facilitate negotiating with industry
√		Pay patent filing fees
√	√	Develop commercial strategy and target list
√	√	Prepare one page marketing flyer
√	√	Protect confidential discussions with NDA
	√	Champion invention
√		Negotiate licence agreement
√		Obtain legal review of agreement
√	√	Facilitate transfer of technology to licensee
	√	Report any conflict of interest
√		Monitor licence agreement / audit
√		Distribute licence income



PATENTING AND PUBLISHING

Rationale

The only reason we would apply for patent protection is for commercial purposes, i.e. to sell your invention. The sale price will only be as good as;

1. The strength of your patent and,
2. The potential of your patent to earn the buyer money

Anything that compromises the patent should be identified and carefully considered as this will adversely affect 1) and 2) above and hence the return to you!

What constitutes a strong patent?

1. Where the uniqueness of all the important novel steps have not been compromised.
2. Where any potential “work arounds” by competitors have been made very difficult by proper consideration and that these “work arounds” are included in the patent as far as possible. That is the patent covers a broad scope.
3. That the patent is drafted in a manner that clearly describes your invention.

A patent agent will generally work with the material you provide (including the Invention Disclosure). Typically this will cover your invention. A strong patent differs from a weak patent in its ability to block competitors from working out ways to avoid infringing your patent. To ensure that your patent is as strong as it can be we would strongly advise you to disclose to the agent;

- Alternative steps that may not necessarily be as clever as your preferred embodiments. However if a competitor used these steps (and your patent did not cover these) they would be able to provide a similar product to the market. The patent agent can advise if it will be a good strategy to include these variations/ embodiments in the patent or not.
- How you worked around competitors patents, or how yours is different. You should carry out a top line search using one of the many online search engines (detailed in the Entrepreneurial Resources section of our website www.commercialisation.NUI Maynooth.ie) to understand the relevant prior art. A search may quickly reveal that your idea is already patented which could save you a lot of time.

As the draft of the patent is being written it is essential that it is reviewed so that it provides the maximum coverage for your idea, i.e. it will provide a strong commercial position to any potential Licensee.

Publication and patenting can live in harmony. However the process should be seen as part of a strategy rather than as separate stages. There are a few important steps to ensure that publication does not jeopardise the patent as follows;

Peer reviewing

When you are considering sending a paper in for publication be aware that this may constitute a disclosure which could invalidate your patent claims. If a patent has not been filed on the subject matter to be published and it is considered that the subject matter has commercial potential it is essential that there is clarity from the publishers that the information will be treated confidentially during the review process. An email with the following text should be sent to the publishers prior to submission *“Could you please confirm that any material submitted by us for review will be treated in confidence until published”*. Material should not be submitted until this has been confirmed. It is up to you to ensure this is in place. If there is any doubt around this please contact the Commercialisation Office. Additionally some journals publish an e-abstract in advance of the journal article. If this abstract is “enabling”, then it will constitute disclosure and patent rights are lost

Even if the publishers have confirmed that papers treated a confidential any paper which is sent in for peer review must have CONFIDENTIAL clearly marked on it, this adds a useful reminder to the reviewers as to their obligations. During this process the invention/ discovery doesn’t have to be patented. However the invention must be protected immediately prior to publication. You should allow for up to 3 months (depending on the complexity of the material and prior art) for the patent to be drafted. It is critical to allow for sufficient time for the patent agent to draft the specification so as to provide the broadest patent coverage.

Tactics - contents of the paper and peer reviewers

Your peers will be reviewing the submitted paper. Assuming the reviewing body have agreed that the submission is confidential they are obliged to keep anything that you have disclosed as confidential until it is published. A very important point to remember is that the reviewers are only obliged to keep the exact contents of your paper private. If you feel your invention will open up a new area/ direction of research (thus creating new opportunities for creating IP) it is even more important that a strong publishing/ patenting strategy is in place. Where your research has the potential to generate food for thought to other researchers and industry it is important that future outputs be considered and protected prior to any submission for publication. This is often a complex area and should be reviewed by a team including the researcher, our office and a patent agent. For clarity, any abstract sent to a journal where there is no agreement about confidentiality should not contain any “enabling” details which would jeopardise the IP. If there is doubt consult with our office.



THE PATENTING PROCESS

What is a patent?

A patent gives the holder the right to exclude others from making, using, selling or offering for sale, or importing any patented invention. Note that a patent does not provide the holder with any affirmative right to practice the technology. To do so might require license from another IP holder. For example, you may hold a patent on a new antibiotic but to deliver the antibiotic to a patient you may need additional technology on say drug delivery, a patent for which may be held by another party. So you can prevent all parties from practicing your invention but you cannot necessarily practice it yourself. The patent claims are the legal definition of the protected invention.

What constitutes a patent?

A new invention is deemed patentable if it satisfies the following criteria:

- The invention has utility.
- The invention is novel.
- The invention is non-obvious or inventive.
- The patent description is a blueprint such that someone skilled in the art can reduce the invention to practice. This called an “enabling disclosure”.

Let’s look at each one:

Utility broadly this means that the invention provides some new and useful process, design, machine or matter composition. Utility means providing a better and more advantageous way of doing something. For example, one might formulate a novel chemical compound, but without clear utility it is not patentable.

Novelty this means that the invention has not been described before, anywhere, either written or orally. To protect novelty you must ensure that you do not talk about, publish or in any way reveal your invention prior to filing for patent.

Inventive this means that the invention must include a non-obvious step over the known prior art by someone skilled in the art. This can be the most difficult to assess. Very often an invention may seem obvious after the fact. The examiner will look at all prior art and look at how a person skilled in the particular art would make an advancement. If your advancement is different to what would be the obvious next step, then it is deemed inventive. Some inventions may apply some principle known elsewhere to advance a particular art. A surprising result also constitutes a non-obvious step.

In almost all international jurisdictions the following are deemed patentable:

- new process
- new design
- new machine
- new matter composition

Patent law is governed by statute law and case law, so that although the statutes are fairly similar internationally, there have been deviations in case law across jurisdictions, with resulting divergence in patentability.

Stuff that is generally not patentable:

- natural law
- mental step
- mathematical algorithm
- article in natural state
- human cloning
- implements of torture
- essential life processes

Patentable only in the US:

- method of treatment by therapy
- surgical method
- diagnostic method

There are some subtleties:

- Outside of the US, software per se is not considered to be patentable. However, a new patentable process or method that is entirely embodied in software may be patentable.
- Business methods, which have been implemented in some tangible way (they are not simply abstract ideas, e.g. they are embodied in software) can be patentable in the US. Elsewhere, an invention must provide some technical contribution rather than simply utilizing otherwise conventional software to implement a business methodology.
- An isolated genetic sequence, which is an article in its natural state and an essential life process, may be patentable if it can be used to produce a new drug to combat disease, for example.

Software

Software developments can be protected by IP rights such as copyright and patents (although some national laws state that computer programs are not patentable – because the programs *per se* are protected by copyright – an invention underlying a new piece of software can be patentable as long as it fulfils the criteria of utility, novelty and inventiveness discussed below). The open-source movement promotes the distribution of some software source code (operating systems for example) on a free basis to promote development. This movement has an important place in global innovation and NUI Maynooth will support the open-source movement under certain circumstances.

Should I fill in an Invention disclosure for software?

It is not necessary to complete an Invention Disclosure on new software. However, it is good practice to protect copyright by using a Certificate of Originality

This can be done by the developers and includes:

- Author
- When created
- What the material is and a version no.
- Issued copies

A template is available from NUI Maynooth commercialisation staff. Remember that software code on its own is not patentable but a new process or method that is entirely embodied in software may be patentable (“computer implemented invention”). Any such development should be written up as an Invention Disclosure.

Should I fill in an Invention Disclose for research tools?

Research tools are materials such as antibodies, vectors, cell lines, plasmids, genetic material and other materials used as tools in the research process. They do not always need to be protected by patents in order to be licensed commercially. Some research tools, such as separation methods and processes may need to be patented. Because of the commercial value of research tools we recommend you complete an Invention Disclosure. Even if we choose not to file for patent, we may post the technology offer on our website and seek to attract a commercial licensee.

What is the definition of an inventor?

An inventor is a person who takes part in the conception of the ideas that are incorporated in the patent claims of a patent application. Inventorship may thus change as patent claims are changed during prosecution. The Invention Disclosure requests a list of inventors and their contribution (for royalty sharing purposes) but the patent lawyers may help determine who the actual inventors are. It is important that proper consideration be given to this issue to avoid any disputes at a later stage.

How long is the patenting process?

Fig.2 on the following page shows the typical patent timeline being 2- 3 months (from the *eureka* moment to the patent being lodged with the patent office) although this may be extended in certain circumstances (see Patenting and Publishing). Generally, NUI Maynooth will file a patent initially in Ireland, setting an internationally respected priority date. Within one year it is necessary to decide on either national phase filings in jurisdictions of choice or to file an application under the Patent Cooperation Treaty (PCT), which allows a further 18 months before the National phase begins. About 2 years after filing an office action is issued by the patent office, where additional prior art may be presented or certain claims may be rejected. A response process begins and hopefully ends with a patent grant some time later.

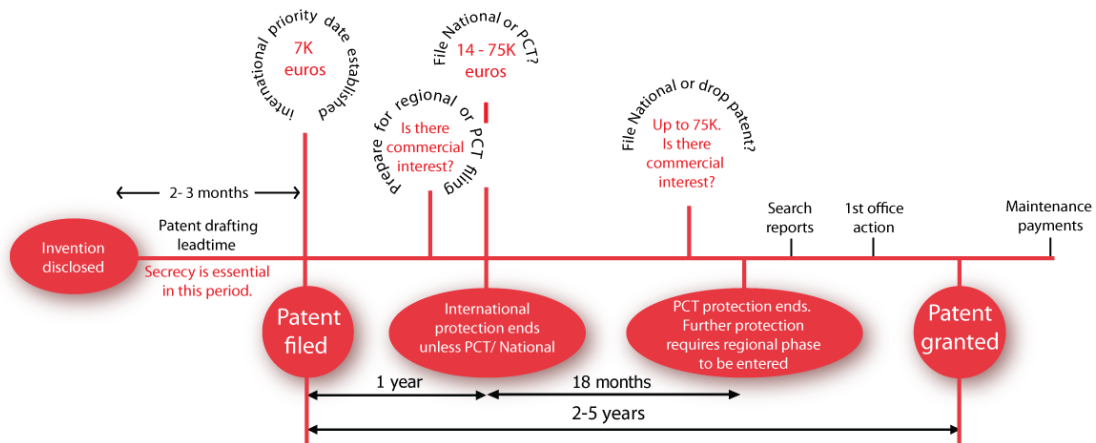


Fig. 2

Timing

An idea of the costs of the various stages for patents (as of 2008) are as follows;

Stage 1: Priority - First 12 months: approx €7K

Stage 2: PCT- Subsequent 18 months: approx €14K

Stage 3: Nationalisation - €50K minimum.

It is important that further product/ process development resources are understood by our office prior to filing the patent as this will affect the time required to get a demonstrator to approach companies with a view to selling your invention/ discovery. In most cases this initial commercialisation process needs to be completed in 12 months (prior to stage 2) to determine the level of interest from industry.

Additional information can be added to your patent at the end of stage 1 and stage 2 if it not a substantial deviation from the original application. If the variations are outside the scope of the original patent then a new patent may need to be filed which in effect doubles the costs. Sometimes all the steps to cover “work arounds” cannot be put in the same patent, but it can be significantly beneficial to include as many steps in the one patent application at the initial filing (start of Stage 1).

Stage 1 funding applications are normally successful for strong ideas with commercial potential. Stage 2 is more difficult and normally requires a good level of commercial interest. Stage 3 will require a commercial licence or strong level of commitment from Industry/ very significant market potential.

Due to the significant costs and resources employed in filing patents it should be obvious from the Stages above and associated costs that patenting and hence publication should be delayed until it is felt that a strong patent including variations and “work arounds” can be drafted. In an ideal world we would like to be able to approach potential companies with your invention in the first 6 months of stage 1. This allows us to assess the interest and hence applicability for stage 2 funding. Most patent applications do not make it past stage 2 because the technology was not sufficiently developed to allow us to credibly approach potential licensees with working models or some sort of credible demonstration. Once a patent or patent application is lapsed you may no longer claim that you have a patent, and if it was published or otherwise disclosed it becomes public knowledge.

As discussed in order to protect the contents of a paper we must patent it prior to publication. In a purely commercial context a patent application would often be delayed until the technology was sufficiently developed thus minimising any modifications to the application which results in a more cost effective filing and often a stronger patent. While we realise that there is pressure to publish within NUI Maynooth we would ask you to be aware of these issues as they can and do affect the commercial prospects of the commercialisation exercise.

Who pays the bills?

Commercialisation is driven by sound business decisions. Protecting IP is a costly process and should only be done where clear benefit is envisaged. Most patents make no money and are cost centres. Only a small percentage of patents return a very high return-on-investment. But predicting which ones will be successful is almost impossible. So the process is driven by investing in many and betting that a few will prove sufficiently financially rewarding to return a profit on the overall expense. At the time of writing Enterprise Ireland cover patenting expenses. This is driven by a desire to improve the innovation and commercialisation of research nationally and a desire to promote discovery and innovation within Irish industry.

Imagine the following scenarios:

(a) Inventor develops new American Football. In this case we will most likely file a US patent only, since the greatest part of the market for the invention will be in the US. This will cost approx €15k to €20k to get to patent grant.

(b) Inventor develops a new Baseball. In this case we will likely file in the US and Japan immediately since again the greatest market for the invention will be in these two countries. This will cost approximately €30k to €40k to get to grant in both countries. If we adopt this strategy we are choosing not to protect the invention (sales, manufacture, use) in countries such as Cuba, Costa Rica and elsewhere.

(c) Inventor develops a new Soccer ball. In this case, we will likely file in Ireland in the first case and file PCT within a year of that priority date. Within 18 months of this filing we need to begin national phase filings and would likely seek patents in Europe, Asia, South and perhaps North America. This could cost upwards of €200k. Argentina has not signed up to the PCT, so we might consider filing in Argentina when we file the PCT application.

Thus it can be seen how the filing for patent involves business decisions. Costs are high and unless a return is envisaged, other technology transfer routes should be considered.

Are there any other differences?

US patent law differs in two ways from most other jurisdictions:

- There is a one-year grace period on public disclosure. So you can still file a US patent within a year of public disclosure of the invention.
- Most jurisdictions use a first-to-file rule for deciding invention priority, while the US use a first-to-invent rule. Proving first-to-invent includes demonstrating when the invention was conceived and when it was reduced-to-practice.

How do I prove date of invention?

Research notebooks (available from the Commercialisation Office) are an essential part of the recording of inventions. They serve several purposes, including recording inventor details and invention date. Notebooks should be hardback, numbered, bound and forgery proof, as far as possible. Observe the following process:

- Record details of work, sequentially as far as possible
- Regularly sign, date, index and witness (not by a co-inventor) details
- Cross-out mistakes and initial
- Don't add information to a page after date of signature.
- Mark out blank pages / sections
- Electronic data should be backed up and secured and location noted

But you can patent anything?

Patents are only awarded when the patentability criteria are satisfied. Of course there are patents awarded in error every year, but in general the process is efficient and stimulates innovation. It seems contradictory to suggest that a monopoly right is good for innovation, but it is the case, and the US is the best example. Innovation occurs when companies are forced to innovate around competitive advantages enjoyed by others.

What about enforcement?

US patent US5443036 is a good (if slightly quirky!) case study. It describes a method for exercising a cat with a laser pointer. The patent examiner would have considered the invention novel, since no description of the invention was found to be recorded prior to the filing date. To assess whether it was inventive (or non-obvious), he would have considered if the invention was obvious to someone skilled in the art of exercising cats and on prior art in that field, and in parallel if the invention was obvious to someone skilled in the art of laser pointers and on prior art in that field.

Of course, the problem occurs when we consider how the owner of the invention (the patent assignee) might enforce the invention. It is very difficult to police, since an infringer would be difficult to detect. This dramatically reduces the commercial value of the invention. Note, however, that if a vendor of laser pointers were to sell their product with a flyer such as “laser pointer – good for presentations and exercising cats”, it would be considered “contributory infringement” without a licence to do so. Furthermore, application of the idea to exercising dogs is not covered by the invention and we are all free to do this. It is very unlikely that a patent would be granted on exercising dogs with laser pointers, since disclosure of the method for cats makes application to dogs “obvious”. One further point: it might be that the holder of this patent would need to license a patent held by the owners of any existing laser pointer patents, demonstrating how a patent can exclude others but not necessarily confer rights to practice.

What happens with improvements?

If you improve the invention within one year of the filing date the improvement can be incorporated into the patent application, provided it has not been disclosed in the interim. However, if the improvement is not “enabled” (where the improvement doesn’t fall within the scope of the invention) in the original application, its effective filing date will be that of the later-filed application.



GETTING TO MARKET

How does NUI Maynooth assess Disclosures?

We are generally not in a position to assess patentability, other than a cursory review for novelty and inventiveness. The patent lawyer will ultimately give an estimated opinion of patentability. We are generally more concerned with how the invention will give a return-on-investment. This involves estimating market size, potential market penetration and average selling price for the end-product. Additional factors include barriers to entry, relationships with potential licensing partners and commercialisation options.

How are inventions marketed?

Marketing activity begins as soon as the Invention Disclosure is submitted. We will need to make an estimate of the market opportunity for the discovery, asking questions such as:

- What is the technology application?
- Is it nice-to-have or must-have?
- What are the market drivers?
- Who will buy and why?
- What are the barriers to entry?
- What are the bring-to-market options?

This process continues but in more detail during the proof of market phase, which should be done in parallel with proof of concept work. Once the patent is filed, we prepare a marketing flyer, which we use as an introduction to the technology. All flyers are advertised on <http://commercialisation.nuim.ie/industry/opportunities>. We try to capture details of the innovation, advantages over existing state-of-art and the benefits of the new development. In addition we post our available technologies on websites such as Utek's <http://www.knowledgeexpress.com/>. However, all of these represent passive marketing and success is limited.

An active licensing strategy is far more effective and often begins with existing relationships with industry. We constantly seek to build such networks and appreciate all help from researchers in this regard. It is recognised that introduction of prospective licensees by the academic inventor leads to more completed deals than push marketing by an intermediary. Enterprise Ireland may also be able to help in making such connections. In addition, we may use licence brokers with existing links to industry to help broker licence deals.

Does Industry want our technology?

ICT product cycles are <1year on average and >99% of test molecules don't get to market. With the resulting stress on developing a large pipeline of potential products many companies now use Search and Development to augment in-house R&D. They recognise that to maintain an innovative product stream they must broaden their research horizons. Companies are increasingly looking outside their organisations for

new IP. There is a shift in attitude in some organisations from “Not invented here” to “Proudly found elsewhere”. Most multinationals and large scale enterprises have a licensing-in program, and SME’s are now embracing the same concept. NUI Maynooth is constantly improving it’s profile in this area which should result in an increase in the Licensing activity in the years to come.

What is a Licence?

A licence is permission granted by the owner of intellectual property allowing another party to act under some or all of the owner’s rights. Licence agreements are in writing and describe the rights and responsibilities related to the granted use and exploitation of the intellectual property. The licence agreement will generally seek to ensure that the licensee brings the technology to market and pays a financial return for doing so.

What are IP Access Rights?

IP ownership and access rights may be different. An IP owner can assign access rights via a licence agreement. These can be exclusive, sole or non-exclusive. They are further characterised by region, time, transferability and payment. For example a non-exclusive, perpetual, paid-up, royalty-free, worldwide, irrevocable, sub-licensable, transferable licence means the licensor grants the licensee rights to the technology non-exclusively around the world for free and that the licence can be transferred and or sub-licensed to another party. If a patent, for example, is jointly owned, exploitation rights can be different across jurisdictions, for example, in some cases each joint owner must request permission from the other owners to exploit the patent, whereas in others each owner is free to exploit without permission from the other.

How is a licensee selected?

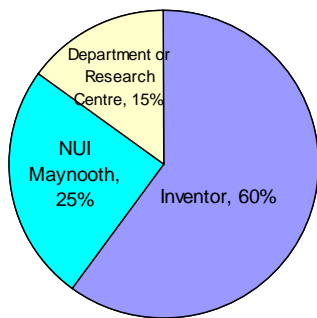
A licensee will typically be selected for its ability to bring a certain technology to market. This is either an established business with experience and products in the relevant market or may be a new start-up initiated to exploit a platform technology or develop new markets.

What are the typical terms?

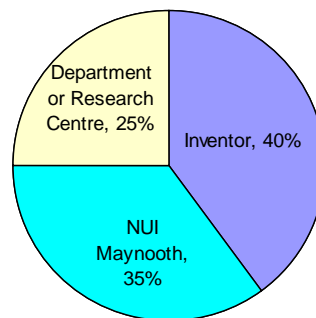
A licence agreement should provide for a fair return to NUI Maynooth if the product is successful in the marketplace. Typically, revenues to NUI Maynooth will be royalties on sales and the percentage will be based on factors such as profit margin, exclusivity, standard industry rates, competitive position and patent strength. Licenses will also generally provide an upfront technology transfer payment, minimum annual or maintenance payment and milestone payments. If the licensee is a spin-out, then we generally take an equity stake *in-lieu* of cash.

What if my technology is licensed?

A share of any financial return from a licence is provided to the inventors. The share is of net royalty income (that is, with costs deducted) and is distributed according to the table on the next page.



All net royalty income below €100k



Subsequent net royalty income above €100k



START-UP COMPANIES

What is a start-up and why do it?

A start-up is a new business created to exploit a commercial opportunity. Typically, if the start-up emerges from NUI Maynooth research, the company will seek to exploit IP in a particular market. Forming a start-up is an alternative to licensing to an existing business. Figure 3 highlights some issues to consider when choosing between forming a start-up or licensing to an existing company. This is a guide only and although NUI Maynooth will ask all these questions of a promoter prior to launching a start-up, we will support the promoter's decision if we are convinced that the technology can be successfully brought to market.

<u>License</u>	<u>Spin-out</u>
1. Single application	1. Platform technology
2. No desire from promoter to spin-out	2. Scalable business model
3. No management team	3. Academic or promoter is entrepreneur
4. Strong barriers to entry	4. Can build strong spin-out team
5. Finance will be difficult to raise	5. Clear route to market
6. Strong competition	6. Funding path clear

Fig 3

However, there are some key considerations if considering a start-up:

- Is the target market large enough and does the technology offer a competitive advantage.
- Do you have the right support team in place (sales, finance and marketing).
- Is there a viable business plan, including sound finance plan, product pipeline and sales and marketing plan.

Figure 4 on the following page shows the parallel commercial, management and technical efforts essential to any product development and release. It is advisable to be as far along this track as possible prior to the spinout for several reasons:

- Reduction of risk (technical and market) will ensure a better deal when it comes to raising finance and ensure better long-term viability.
- Access to NUI Maynooth supports and research under more flexible terms.
- The start-up marks the beginning of real-world pressure: income, taxation, insurance, liability and so on.

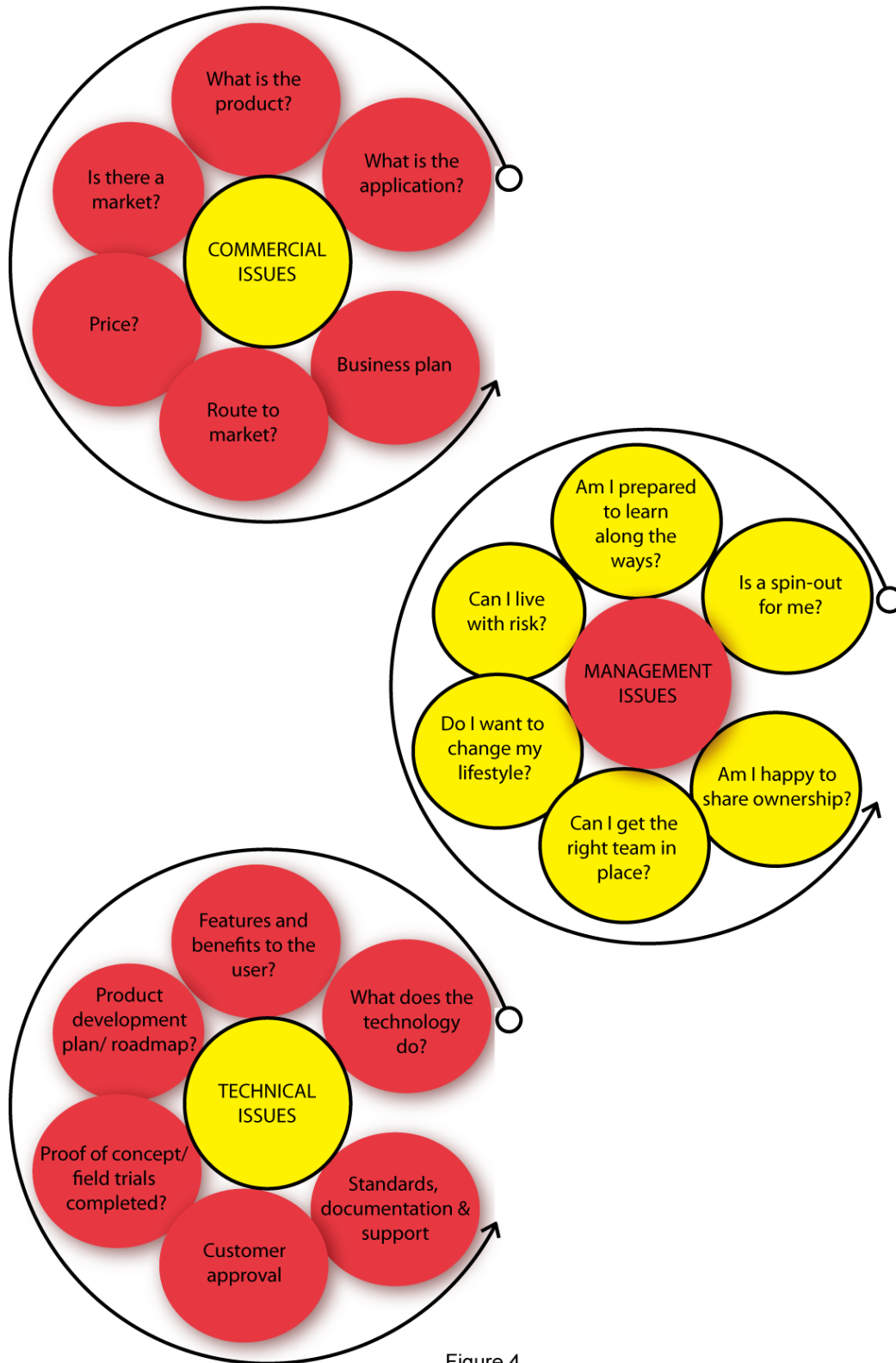


Figure.4

The biggest hurdle to forming a start-up is the issue of seed funding. There is a lack of seed funding opportunities in Ireland and we do not yet have the depth of seed funds available in places such as the US and the UK. This is particularly the case for angel funds. Angels are private investors, sometimes with high net worth, who invest in start-ups and particularly their promoters. They often act as business partners and mentors and their experience can be very valuable. Figure 5 below shows options for funding and risk appetite against investment size.

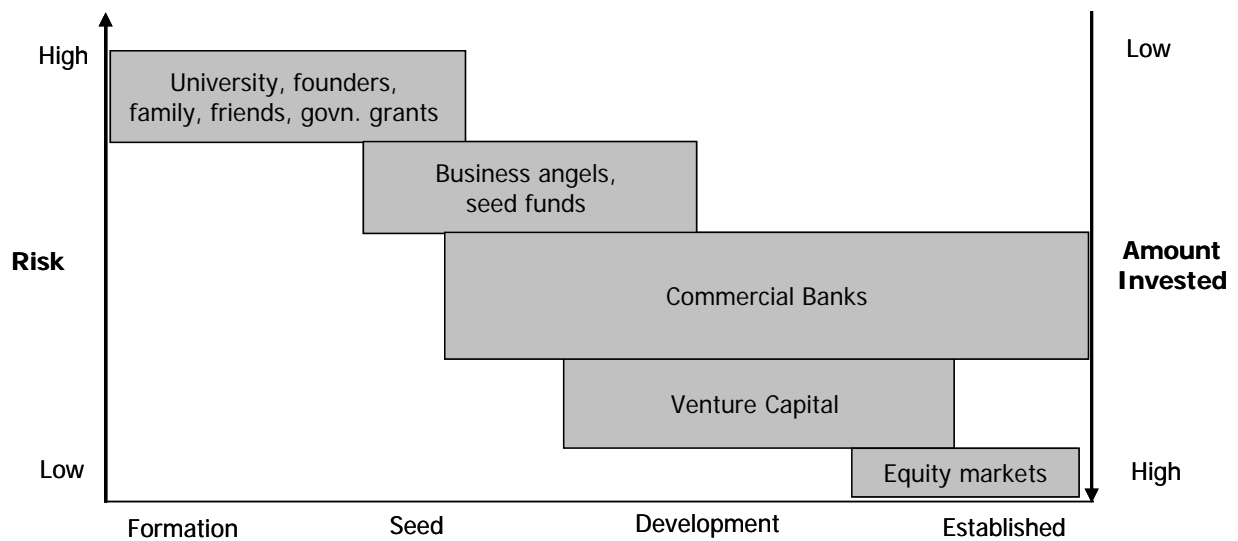


Figure 5

Do I need a business plan?

You need to be formulating your business plan as you go through the proof of market and proof of concept phases. It should address the following headings:

- Market size (potential or available market).
- Market needs.
- Market inflection points
- Competition/ monopoly rights
- Unique selling proposition/ product strategy
- Sales and distribution model and pricing strategy.
- Corporate structure/ management/ employees
- Financial plan

It is very important to talk through your plan with as many people as possible seeking feedback on all aspects. NUI Maynooth will introduce you to experienced entrepreneurs and venture capital companies. Exploring your business proposal informally well in advance of an official pitch is very valuable. Your business plan has two parts:

1. A very short presentation (ten slides) capturing the points above.
2. A detailed document addressing each heading with a convincing plan.

What is a conflict of interest?

A conflict of interest can occur when an NUI Maynooth employee, through a relationship with another party and is in a position to (a) influence NUI Maynooth research or business which may lead to direct or indirect financial gain, (b) provide improper advantage to others to the disadvantage of NUI Maynooth. Whenever an uncertainty arises you should seek guidance from the Commercialisation Office.



RESEARCH CONTRACTS

Introduction

New discoveries begin with the research, which will either be publicly funded, privately funded or a combination of the two. For example, the Commercialisation Fund from Enterprise Ireland is publicly funded. Science Foundation Ireland research awards are also publicly funded, but can include many parties, for example Centres for Science, Engineering and Technology (CSET's). The Enterprise Ireland Innovation Partnership is a public-private research partnership. Individual private entities may also request specific research to be undertaken. All of these research grants and awards will have contracts associated with them which include terms and conditions that cover payment, outcome delivery, ownership of IP, publication, liability, and more. *Any serious research engagement should have an associated contract.*

ICSTI have issued guidelines on how HEI's should treat ownership and access rights to research outputs. These are based on best practice and principles of fair and equitable assignment. The table on the following page is a guideline to how IP rights are divided. In general, they can be seen to fall under three separate groupings:

Contract research is where a company or other body requests a specific task in exchange for a fee. If the company directs a task that involves specific steps where the output is generally known and NUI Maynooth do not add know-how or IP to the process, apart from being fit to carry out the task, then IP will generally be assigned to the company.

Sponsored research, which can be privately, publicly or jointly funded, involves the case where a problem statement is made and experts attempt to solve the problem through inventive and exploratory research. In the case of publicly funded research, all IP will be owned by the University. In the case of privately or jointly funded research, IP will generally be covered by an inventor's employer ownership model with provision for jointly developed IP. An option on access rights may also be included.

Collaborative research involves several parties, public and private. Again, an inventor's employer ownership model is usually used and access rights are defined in the contract.

We maintain templates for each of these research contracts and decide which template to apply in any particular situation. The following table provides an overview of these contracts.



FUNDING MODEL	100% Company / Private Entity Funding		Joint Private & Public Funding	100% Public Funding
	(A) Company directs research Company project manages NUIM provide facilities NUIM provides some skills	(B) Jointly direct research NUIM adds know-how NUIM adds background IP	Jointly directed research NUIM adds know-how NUIM adds background IP Company adds background IP	NUIM directs research
IP OWNERSHIP	Company owns all IP	Inventor's employer owns IP Joint inventions are jointly owned	Inventor's employer owns IP Joint inventions are jointly owned	NUIM owns all IP
IP ACCESS	NUIM may have IP access rights for research purposes	Company gets non-exclusive, royalty free access to NUIM foreground IP	Company gets first option to negotiate licence to NUIM foreground IP	IP commercialised via licensing
Company Investment	€ + Data	€ + Data	€	-
Company Return-on-Investment	Solution	Solution	Solution	-
Public Investment	-	Skills, IP, know-how, facilities	€, Skills, IP, know-how, facilities	€
Public Return-on-Investment	-	€ + new IP	€ + new IP	€, Knowledge

What about research collaborations?

Research collaboration between HEI's is a very important part of the research process and should be encouraged. The research contract will cover the terms and conditions of the knowledge sharing. It is important to understand that if you wish to share outputs of research such as software, bio-materials, chemicals, prototypes, etc. you need to complete a Materials Transfer Agreement (MTA). This covers the usage and IP rights associated with shared materials. It may also be necessary to complete a non-disclosure agreement (NDA) that covers the sharing of confidential information and know-how. Please seek advice from our office staff for procedures, templates and policy regarding MTA's and NDA's.

Are publication rights protected?

Publication of research output is critical to knowledge advancement and to the mission of NUI Maynooth. When dealing with commercialisation, however, it is often necessary to protect the proprietary nature of research output. This can put some restrictions on publication. In most cases this simply means a delay to ensure patent filing. See Patenting and publishing for more details.

Are research rights protected?

It is very important that we do not restrict our research freedom in any way. This is particularly relevant when negotiating research and licence contracts. In general, we will always strive to maintain IP rights for research purposes.

Does NUI Maynooth allow consulting?

When staff members enter into consulting agreements they are subject to the NUI Maynooth Consulting Policy <http://commercialisation.nuim.ie/researchers/policies> and are deemed to be acting outside the scope of their employment. Staff are therefore expected to ensure that the terms of the consulting arrangement are consistent with NUI Maynooth policies, including those relating to IP ownership, ethics and employment responsibilities. In addition the researcher is responsible for all liability, insurance and taxation issues. All such work should be done without the use of NUI Maynooth facilities or the name of NUI Maynooth. The acting consultant should use his/her home address on any contract and the NUI Maynooth name should not be used or mentioned anywhere.

Who can sign contracts?

The only legal signatures on **any** NUI Maynooth contract including confidentiality agreements, MTA's, research agreements, grant acceptance agreements, contractual agreements or any other legal agreement are the Bursar, the Vice President for Research and the President. All these agreements have to firstly get approved by the Commercialisation Office. Any other signature on the agreements is not legally binding.