



Module 4: Intellectual Property and Commercialisation

Introduction

This module has been developed to give researchers from all disciplines a comprehensive introduction to commercialisation – from identifying IP, to its protection, packaging and commercial development. Commercialisation can be a long and complex process. However, at the completion of this module you should have developed an understanding of the process, which will enable you to participate with your university's research commercialisation office or company to commercialise your research. Your university will work with you to identify research with commercial potential, protect the IP, and package it for commercialisation.

Universities can deliver tremendous economic and social value by commercialising the research knowledge developed by their researchers. Whether the knowledge is a research outcome or skills and expertise, it can be generated by researchers across all disciplines. Knowledge transfer can include a broad range of activities from research to teaching to undertaking community services. However, knowledge transfer may also involve the transfer of knowledge to the marketplace, which is referred to as commercialisation. This process involves the protection and packaging of the intellectual property (IP) inherent in the research knowledge into a 'product'. ('Product' is used loosely in this context to refer to a range of potential commercialisation outcomes, ranging from actual physical products such as a publication or a pharmaceutical therapeutic to a technology or consulting activities.)

The potential economic value of the intellectual property involved in commercialisation requires the IP to be protected. Depending on the type of IP, there are various ways to protect it from copyright to patenting. Protecting the IP allows it to be treated as any other asset meaning that it may be sold or licensed or traded.

An informed, passionate and committed researcher is essential to the successful outcome of any commercial venture. While the process will not be straightforward, the rewards for individual investigators can include direct financial gain, ongoing funding for their research program and, not least, the satisfaction of seeing their innovation applied beyond the research context.

This module comprises independent-study online learning material that needs to be completed prior to an end-of-module workshop. The total time commitment (including the workshop) is in the order of 8 to 12 hours.

This module comprises online learning material and a workshop.

You are expected to devote time to reading the online material and carrying out compulsory activities before attending the workshop. This module should take less than two hours to read and you may need to devote up to another half hour to carry out the compulsory activities.

The workshop is based on the assumption that you have completed the reading and carried out the compulsory activities.

Aims

This module was designed to provide university researchers with an introduction to commercialisation. An emphasis has been placed on ensuring the researcher gains a broad understanding and appreciation of the processes involved in identifying, protecting and packaging innovations for the marketplace. Such an understanding should provide a critical base for researchers wishing to participate in and appreciate the complex commercialisation process.

Learning outcomes

After completing this module you should be able to:

- Define and differentiate the types of intellectual property
- Describe the nature of intellectual property management
- Outline the way to structure a research project to generate IP with commercial potential
- Summarise the ways to protect intellectual property on a daily basis
- Appreciate the issues relating to intellectual property ownership for employees and students
- Comprehend the broad commercialisation process
- Cite the pathways of commercialisation
- Identify sources of funding for commercialisation
- Recognise specific roles researchers can play in the commercialisation process
- Identify the points at which a financial return can be realised

- Understand the profit sharing policy of your research institution

Content overview

The module comprises the following topics:

1. Intellectual Property (IP) in a university context

What is IP and how is it protected? In a research context, we look at identifying research with IP and evaluating its commercial potential. We conclude with the issues of IP ownership, the costs associated with IP protection and ways in which IP should be protected on a daily basis.

Topic 1 is divided into the following subtopics:

- 1.1 Types of intellectual property
- 1.2 Protecting IP internationally
- 1.3 Key issues in IP management

2. Commercialisation

The commercialisation process is reviewed in its entirety with a detailed look at key options, funding, exiting the process and the involvement of the researcher.

Topic 2 is divided into the following subtopics:

- 2.1 The commercialisation process – an overview
- 2.2 Stages and pathways
- 2.3 Funding
- 2.4 Role of the researcher
- 2.5 Realising a return

IP and commercialisation dictionary

There is a considerable amount of jargon used by IP and commercialisation professionals. To assist with understanding this jargon, a short [Dictionary of commonly used terms](#) has been assembled.

The Dictionary of terms can also be accessed via the module [Organiser](#) page.

Activities

Activities are included in the module to help you apply the knowledge in a real life context. These activities will culminate with you discussing these ideas in the workshop with a commercialisation professional and fellow researchers. As part of the workshop you will have the opportunity to discuss any issues you have about IP and commercialisation.

Facilitator at your University

Acknowledgements

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Accessing the module material





Now that you have read the module introduction you can access and navigate your way through the module content via the Module 4 Organiser link in the navigation bar at the top left of this page or in the bar below.

If you wish to print this page you can generate a pdf file via this printer icon []. A pdf file for each topic in this module can be generated using the printer icon to the left of each topic title on the Organiser page.

[< Organiser >](#)

Module 4: Intellectual property and commercialisation

Organiser

Topic	Subtopics	Activities	At your University
 Introduction			At your University
 1. Intellectual property (IP) in a university context	1.1 Types of intellectual property 1.2 Protecting IP internationally 1.3 Key issues in IP management	Activity 1: What IP issues need to be resolved? Activity 2: IP in your research project	At your University 1 At your University 1.1 At your University 1.3
 2. Commercialisation and Translation	2.1 The commercialisation process – an overview 2.2 Stages and pathways 2.3 Funding 2.4 Role of the researcher 2.5 Realising a return	Activity 3: Research project reflections Optional activity: Read the examples of successful commercialisation ventures	At your University 2 At your University 2.2
 Module review and completion	Frequently Asked Questions Checklist Record of completion	Guided conversation	

Module 4: Intellectual property and commercialisation

Topic 1: Intellectual Property (IP) in a university context

Introduction

Intellectual property (IP) is proprietary knowledge which is the outcome of research or creative effort – it is the property of your mind or intellect. Internationally, governments have recognised that economic incentives propel research, and have therefore legislated to create rights for protecting an inventor's IP. In this way inventors are encouraged to disclose their IP, benefiting them and society as well.

IP is the exclusive property of the owner. It is an asset which, like any other property, can be bought, sold, licensed (rented), or destroyed. IP can give businesses a competitive edge in the market place – often becoming the basis of a large industry.

Managing IP is often complex, requiring the skills and experience of patent attorneys, commercial managers, and other specialists to plan the best strategy for protecting and realising its value.

As a researcher, you generate knowledge which is likely to have IP implications. It is important to understand the opportunities, together with your rights and obligations and those of your university, in relation to these research outputs. IP is often a key tool as part of the process of translating research outputs from a university context into successful products and services used broadly in society.

Learning outcomes

After completing this module you should be able to:

- Define and differentiate the types of intellectual property
- Describe the nature of IP management
- Delineate the ways to protect IP on a daily basis
- Identify potential IP in research
- Outline the way to structure a research project to generate IP with commercial potential
- Comprehend the issues relating to intellectual property ownership for employees and students.

Topic content

The concept of intellectual property is first defined, and then the means to legally protect IP both in Australia and overseas is outlined. We look at how IP with commercial potential is identified and evaluated, as well as the steps researchers can take to structure a research program with the aim of generating commercially valuable IP. The topic concludes with an overview of key issues researchers and universities face in managing their IP – such as ownership, the costs associated with IP protection, and ways in which IP should be protected.

Follow the links below for more detailed information on IP and its management within a research context.

[1.1 Types of Intellectual Property](#)

[1.2 Protecting IP internationally](#)

[1.3 Identifying IP with commercial potential](#)

[1.4 Key issues in IP management](#)

Activities

Complete these activities after you have worked through the subtopics.

Activity 1 – Case Study Safeguarding the Murray-Darling – What IP issues need to be resolved?

(If you have not already done so, please familiarise yourself with the core case study scenario via the link in the heading above.)

Now read this additional information about the case study.

The region inhabited by the Basin's Indigenous community is home to many unique native plant species which form the basis of the group's diet as well as their traditional medicines.

Recently, the state government employed botanist Dr John Arbor to undertake a survey of the native flora growing in these lands. As part of the survey, Dr Arbor spoke with the community to learn how the plants were used. One particular plant, *Enchylaena metasi*, interested Dr Arbor as it appeared to be an effective

topical treatment for skin warts.

With almost half of the pharmaceutical drugs available today derived from natural products,* Dr Arbor believed that *Enchylaena metasi* had the potential to become a new wart treatment. However, he had neither the expertise nor the funding to undertake the necessary research.

*[Butler, M. S. (2005) Natural products to drugs: natural product derived compounds in clinical trials. *Natural Product Reports*, 22: 162–195; Newman, D. J., Cragg, G. M. and Snader, K. M. (2003) Natural products as sources of new drugs over the period 1981–2002. *Journal of Natural Products*, 66(7):1022–37].

After completing the state government survey, Dr Arbor was approached by Medicus Pharmaceuticals Pty Ltd. The company had identified *Enchylaena metasi* as the source of potential anti-cancer compounds and wanted to know if the Indigenous community had any traditional anti-cancer uses for the plant. Medicus expressed an interest to Dr Arbor in being involved in early-stage research programs which exploited the medicinal properties of native flora for use in cancer treatment.

Dr Arbor's ability to investigate *Enchylaena metasi* was further complicated by his ability to legally access the plant. While under the terms of his contract with the state government Dr Arbor held a permit to collect plant samples for conservation assessment, his permit did not allow for research outside the field of conservation assessment.

Dr Arbor identified that a state university had several world-renowned plant biotechnologists who could perform the required research with adequate funding. Medicus was willing to fund the research providing they were given a share of the IP.

Your university has agreed to enter a research contract. The university's commercialisation office will be responsible for putting in place the respective legal agreements as well as protecting the generated IP.

Dr Arbor's ability to undertake research on *Enchylaena metasi* and commercialise any outcomes depend on resolving several intellectual property protection issues.

Questions for reflection

1. How will Dr Arbor formalise obtaining the plant material?

If Dr Arbor is still an employee of the state government, then any access to the plant material would be through an agreement between the government and the Murray Darling Management Trust (MDMT), which would cover access to and testing of the materials and set out terms about who would own IP rights and who would benefit if those rights were commercialised. If Dr Arbor is acting in an independent capacity, then he would have to arrange such an agreement on his own with MDMT. The access to materials may also be covered by state or other restrictions on collecting native plant species.

2. Who could do the research and how might this be formalised?

The investigative research on *Enchylaena metasi* could be undertaken by a research group at a university. To formalise this agreement, Dr Arbor and Medicus Pharmaceuticals Pty Ltd will need to enter into a research contract with the university setting out what the different parties would contribute to the research and what rights they would each have to the results.

3. If a product was discovered during the research who would be the inventor?

The inventors (as opposed to the IP owners) are determined by patent law, and these are not necessarily those who did the most work on, or initiated the project. You should take advice from an experienced IP professional if it is not clear.

4. Who owns the intellectual property that might result from the research?

The legal owners of the IP will be specified by the terms of the research contract and any other related agreements that may have been entered into. In an ideal research contract there will be only one owner of the IP (e.g., the state university) as this simplifies the commercialisation process. However, in this case, several interested parties could retain a financial interest in the IP (e.g., Dr Arbor, Medicus, MDMT, the Indigenous community, and the university), although only one may be the legal owner.

When there is more than one owner of the IP, the ability to commercialise it can be compromised. Difficulties arise when it is not clear what rights each party possesses, and the parties opt for different commercialisation pathways or demand different terms in negotiations with commercialisation partners.

However in this particular case, the research contract is between Medicus and the university, and the research contract states (conveniently) that the university owns the IP. There would be an agreement with the company to test the plants. Because the university identifies the active compound they are the inventors AND the owners due to the research clause, unless there had been inputs from other parties. It is likely that neither MDMT, Dr Arbor, or the Indigenous community would be inventors or owners.

5. How could Medicus's request be addressed?

Medicus have stated that they were willing to fund the research as long as they retain an interest in the IP. This could be addressed in the research contract by giving Medicus a "first look and option to license" right. That is, Medicus would have the right to be the first party to review the generated IP for a certain period and then, if it is interested, to take up an option to exclusively license the technology from the university. The terms of such a licence may be agreed upfront or negotiated at the time of taking the

licence. Commercial organisations will often require certainty around their ability to access the results of such research, and broad understanding of the commercial terms that might be involved.

6. How could the IP be protected?

The IP could potentially be protected through a patent.

Case study commentary

This case study provides a valuable insight into the complexity of intellectual property and commercial rights ownership. It further demonstrates best practice principles of determining ownership prior to engaging in commercialisation activities. Through the mapping of the commercialisation process, and having an understanding of the associated legal, financial and business development activities, researchers should be well prepared to protect all IP interests. Seeking early input and professional advice from your respective university technology transfer or commercialisation office is essential.

Activity 2 – IP in your research project

If you believe your research may have commercial potential or be of interest to potential commercial partners, complete the following questions. You may still find it useful to reflect on your IP management even if you think your project does not have commercial application. Please make a note of your responses to these questions and bring them with you to the workshop.

- What is the name of your selected project?
- Describe the research project in one sentence.
- Identify and describe the IP in your research that may need protecting.
- Identify the researcher or researchers who came up with the idea for the IP. Are they different from those who actually carried out the practical work? (Was anyone else involved?)
- What form of protection is best suited to the IP?
- Have you been keeping a record of the research process? If so, how?
- Has the IP been previously disclosed beyond the research team?
If yes, note in which of the following:
 - Published a paper
 - Gave a talk to a conference, or a group with members of the audience from another institution
 - Displayed in a poster
 - Detailed the innovation to someone outside the research group without a confidentiality agreement
 - Described on a website
 - A collaborator has disclosed the IP by any of the above means
 - Other (such as described in an annual report, a newspaper article, or other non-scientific publication).
- Who do you think owns the IP?
- What funding was used to develop the IP, and were there any conditions on IP in that funding agreement?
- Were materials obtained from another organisation under an agreement such as a material transfer agreement (MTA)?

At your University

Pursuing the topic further

Engaging with this material (and the material in other sections of the module under the same heading) is optional. However, if you wish to gain a deeper understanding of the topic you may find the following websites useful:

IP Australia: a federal government organisation providing legal information and registration material for trade marks, patents, designs, and intellectual property. <http://www.ipaustralia.gov.au>

United States Patent and Trademarks Office (USPTO): search American patents and trade marks. <http://www.uspto.gov>

World Intellectual Property Organisation (WIPO): a variety of IP-related resources, including searching facilities for international patents. <http://www.wipo.int/portal/index.html.en>

European Patent Office (EPO): access European patents and worldwide searching. <http://www.epo.org/searching/free/espacenet.html>

Module 4: Intellectual property and commercialisation

1.1 Types of intellectual property

Within Australia, a number of forms of intellectual property are afforded legal protection. Some of these are protected under legislation (the various acts including the Copyright Act, Patents Act, etc.). Other forms of intellectual property are protected by 'common law', that is legal principles that are developed based on precedents established by previously decided cases concerned with similar facts (e.g., cases involving passing off and treatment of confidential information).

- Patents
- Designs
- Trade marks
- Copyright
- Plant breeders' rights
- Circuit layout rights
- Trade secrets/confidential information
- Passing off
- Business names/domain names
- Open licensing/open source.

1.1.1 Patents

Patents are granted for inventions which may be thought of as new solutions to technical problems. According to IP Australia, patents cover "any device, substance, method or process which is new, inventive and useful". As with most forms of intellectual property, a patent grants a limited monopoly in return for some knowledge being returned to society. In the case of patents, the inventor shares their know-how by providing a full description of how their invention works. This information becomes public and can provide the basis for further research by others.

Artistic creations, mathematical models, plans, business schemes, or other purely mental processes will not be granted patent protection.

Key Requirements for Patenting

Patent protection is not automatic and a patent application must be filed and prosecuted with the national patent office in each territory where patent protection is desired. They will assess whether the invention satisfies three main criteria:

- Novelty (has it been known, used, or published before?)
- Inventive step (does it have an inventive step; could anyone skilled in the art have done it?)
- Commercial utility (is it useful for anything?).

The application must describe the characteristics of the invention broadly and accurately, and state the extent of the patent rights sought. A thorough search of the patents database and academic literature and careful drafting of the application is necessary. This searching should be carried out in collaboration with your commercialisation office, who will be able to advise how best to carry it out.

The patentability of an invention can be jeopardised by public disclosure, even if such disclosure does not disclose the full detail of an invention. In order to qualify for patent protection, new inventions must not be discussed, demonstrated in public, or sold prior to filing a patent application. Publication in an academic journal, a presentation at a conference, or even a poster describing an invention can undermine the required novelty criteria mentioned above.

Patent applications are published and join a library of more than 30 million patent documents world-wide. It is estimated that more than 70 per cent of technical information is published on this database, making it a valuable source of commercial information. For researchers, or those wanting to keep an eye on their competitors' activities, the patents database is a unique resource, and complementary to conventional databases of academic publications.

Rights

The holder of a patent has the exclusive right to stop any other party commercially exploiting the invention. This is a negative right as it does not explicitly give the patent holder the right to exploit the invention, only to prevent others from doing so. This is an important factor in understanding the role of patents in translating research outcomes.

Reasons that the patent holder may not be able to exploit the invention themselves include:

- The existence of other patents covering aspects of the invention

- Regulatory issues not associated with IP.

An example would be a patent for use of a known drug that was currently used to treat cardiovascular disease where it was now discovered that it could be used to treat certain types of cancer. In order to exploit the new invention you would need to see if there were existing patent rights in relation to the composition of the known drug, and also obtain regulatory approval for its new use. For further examples and explanation see:

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC526265/#fn1>

Duration

Standard patents provide protection and control over an invention for up to 20 years from initial filing of the patent.

In Australia it is possible to obtain an innovation patent, which is a relatively fast, inexpensive protection option, providing protection and control over an invention for a maximum of 8 years.

It is recommended that university researchers wishing to patent their IP should:

- Consult with their commercialisation office early in the process to ensure the invention has the best chance of being patented and that you comply with your university's policies;
- Do not publicly disclose the invention before filing a patent application (public demonstration, sale, or discussion of the invention before filing may invalidate the application); and
- Only discuss the invention with staff from other organisations (commercial or academic), business partners, or advisers on a confidential basis. Written confidentiality agreements are advisable and can usually be arranged by your university commercialisation office.

1.1.2 Designs

Designs are registered on the shape or appearance of manufactured goods. The visual features that form the design of goods can include the shape, configuration, pattern, and ornamentation which give the goods a unique appearance. Design registration does not protect the feel of a product, the materials it is constructed from, or its function. A design can be registered if it is new or original.

- New: a design not previously known or applied in Australia
- Original: although the design may have been applied to other products, it has never previously been applied to yours. Design registration prevents others using the design without agreement and initially applies for 12 months. This period can be extended up to 16 years, but varies by country.

Design registration prevents others using the design without consent from the owner. Design registration does not confer any rights to produce the product. Careful searching should be conducted to ensure a proposed registered design does not infringe any other existing rights. There are provisions in the legislation dealing with the overlap between copyright and design protection.

Cost and Complexity

A 'registered design' application requires the preparation of quality drawings. The registration process typically takes a few months. In Australia, a cost estimate is about \$1000 per product. To be enforceable against third parties, a registered design must be certified, costing about another \$800.

International Aspects

Generally speaking, design registration systems are similar in most countries, but the laws and procedures can differ greatly.

In countries where English is not an official language of the industrial property office, applications and associated documents will need to be translated into an official language used by that office. Obviously this can add considerably to the cost and time required to obtain registration.

Some countries require foreign applicants to use the services of a local agent to conduct the registration process. Fees for obtaining and maintaining a registered design in foreign countries vary from country to country, as does the length of protection.

Link to more detailed overview <http://www.ipaustralia.gov.au/designs/index.shtml>

1.1.3 Registered trade marks

Trade marks can be an identifying word, picture, logo, sound, or smell (or a combination of these) used to distinguish the goods and services of a trader from others. Trade marks are used to associate a certain quality and image with goods and services. Consequently a trade mark can become an important means of maintaining goodwill. Once a trade mark is registered, the owner has the exclusive right to use it within Australia for the goods and services for which it is registered. However, it is not strictly necessary to register a trade mark. A trade mark can be established merely by using it and becoming well known.

In order to be registrable, a trade mark must:

- be capable of distinguishing goods or services from the same or similar goods or services of other traders
- not be a mark that other traders would expect to be able to use in the course of their trade (e.g., place names, commonly used trade terms)
- not conflict with an earlier trade mark
- mislead the public about the nature of the goods and services, or about connection or association with another's goods or services
- not be descriptive words or phrases.

Rights

Once a trade mark is registered, the owner has the exclusive right to use it within Australia for the goods and services for which it is registered and to prevent others using the mark without consent from the owner.

Duration

Trade mark registration can be renewed indefinitely.

Cost and Complexity

Approximately \$1500 per class for Australian registration, up to \$7000 per class per country for international registration. The Australian registration process can be expected to take from 7 to 12 months.

It is not strictly necessary to register a trade mark. A trade mark can be established merely by using it. This is referred to as a 'common law', or unregistered trade mark. Such marks are protected under the 'common law' action of 'passing off' and under legislation such as Section 52 of the Trade Practices Act 1974 (Cth) and the various state equivalents that cover misleading and deceptive conduct. However, a registered trade mark is afforded better legal protection than an unregistered mark.

Link to more detailed overview: <http://www.ipaustralia.gov.au/get-the-right-ip/trade-marks/>

1.1.4 Copyright

Copyright law provides incentives for creators to invest their time, talent, and other resources in creating material from which society benefits. In return for the creation of material, creators are granted limited monopolies to exploit and control their work.

Copyright protects against the unauthorised reproduction of original artistic, literary, musical, or dramatic work. It protects the expression of the ideas of the author, not the ideas themselves. It should be noted that copyright applies to computer software, and that copyright initially vests in the creator of the code, but ownership may also be covered by other agreements, such as employment contracts.

Rights

Copyright protection is provided under the Copyright Act 1968 and grants exclusive rights to license others in regard to copying, performing, broadcasting, publishing, or making an adaptation of a work. Rights vary according to the specific nature of material created. The phrase 'all rights reserved' often used in relation to copyright protected material is a good general summation of the creator's (or owner's) position.

There are some very limited and specific exceptions, allowing some copying without permission under the fair dealing provisions of the legislation. Educational institutions have some rights to copy under licensing arrangements.

Copyright does not protect against independent creation of a similar work.

Further details at your University

Moral Rights

Moral rights are an important component of copyright protection and refer to the ongoing rights of the creator of the work in which copyright vests.

Moral rights are personal legal rights of individual creators of copyright material (artificial persons such as companies or institutions do not have moral rights), and cannot be transferred to another party the way that the other 'economic' rights associated with copyright material can be. This means that a user of copyright material must be mindful of the creator's moral rights as well as the rights of the copyright owner, since these may well be two distinct parties.

The moral rights are the right to:

- be attributed (or credited) for their work;
- not have their work falsely attributed; and
- not have their work treated in a derogatory way.

Key Requirements for Protection

Copyright is automatic and material is protected once it has been recorded. A work does not need to have been published to be covered by copyright.

Rights

A copyright notice (with owner's name and date) is not necessary in Australia, but it can help prove matters needed for protection, and may be necessary to establish copyright overseas.

Duration

The term of copyright varies, and can last as long as 70 years after the author's death – so copyright can be passed on as a 'property' within a will.

Cost and Complexity

As registration is not required, or even possible, there are no upfront costs. Legal costs incurred in addressing infringement would range from hundreds of dollars for an initial 'cease and desist' letter from a legal practitioner to very costly litigation.

1.1.5 Plant breeders' rights

Plant Breeder's Rights (PBR) are used to protect new varieties of plants that are distinguishable, uniform, and stable. A PBR is legally enforceable and gives you, the owner, exclusive rights to commercially use it, sell it, direct the production, sale, and distribution of it, and receive royalties from the sale of plants.

PBR lasts for up to 25 years for trees and vines and 20 years for other species. To be eligible for protection, the new variety must be shown to be distinct, uniform, and stable. In a comparative trial the variety must be clearly distinguishable from any other variety, the existence of which is a matter of common knowledge. A new variety may be sold for up to 12 months in Australia, and 4 years overseas, yet still remain eligible for plant breeders' rights. The rights do not cover the use of a grower's crop (the grower does not have to pay a royalty on the crop produced) nor do they extend to retention by growers of seed for the production of another crop or the use of the variety in plant breeding.

Grants of plant breeders' rights give exclusive commercial rights to market a new plant variety or its reproductive material, including the rights to:

- (a) produce or reproduce the material;
- (b) condition the material for the purpose of propagation (conditioning includes cleaning, coating, sorting, packaging, and grading);
- (c) offer the material for sale;
- (d) sell the material;
- (e) import the material;
- (f) export the material; and
- (g) stock the material for any of the purposes described in (a) to (f).

Duration

Registration lasts for up to 25 years for trees and vines and 20 years for other species.

Cost and Complexity

\$300 plus any legal fees for filing application, then full registration fee is \$1700 plus legal fees, with annual fees of \$300 per annum.

The Australian registration process can be expected to take from 7 to 12 months.

Link to more detailed overview <http://www.ipaustralia.gov.au/get-the-right-ip/plant-breeders-rights/>

1.1.6 Circuit layout rights

Circuit layout rights automatically protect original layout designs for integrated circuits and computer chips for up to 20 years. These rights are based on copyright law principles but are a separate, unique form of protection under the Circuit Layout Act 1989 (Cth). The owner of an original circuit layout has exclusive right to:

- Copy or authorise the copying of the layout in a material form
- Make integrated circuits from the layout
- Exploit it commercially in Australia.

Commercial exploitation may occur by importation, sale, hire, or distribution of a layout or an integrated circuit made according to the layout.

Key Registration Requirements

As with copyright protection, there is no requirement, or provision, for registration.

To be protected under the Act, a circuit layout must be original. A circuit layout is considered original under the Act, unless:

- its making involved no creative contribution by the maker; or
- it was commonplace at the time it was made.

Duration

The maximum possible protection period is 20 years from the year of making an eligible layout – 10 years from the date of first exploitation, which must be within 10 years of it first being made.

Cost and Complexity

As with copyright, given that registration is not required, or even possible, there are no upfront costs. Legal costs incurred in addressing infringement would range from hundreds of dollars for an initial 'cease and desist' letter from a legal practitioner to very costly litigation.

Link to more detailed overview <http://www.ipaustralia.gov.au/get-the-right-ip/other-types-of-IP/circuit-layout-rights/>

1.1.7 Trade secrets/confidential information

The ability to protect your IP can be affected if you have made a disclosure before the IP is protected. This may be via publishing a paper, giving a talk at a conference, or even by having a discussion with someone who is not part of your institution. Maintaining secrecy can also be used as a strategy for managing intellectual property generally. In some instances this approach may be more effective or better suited than other forms of protection and may be the only approach available in some circumstances due to the nature of the material.

Also known as "know-how", this includes information such as secret recipes or mixtures, or manufacturing techniques, processes, and conditions.

This is often used as an alternative to patenting for a number of reasons:

- cost – patents are costly and time-consuming
- the time limitation on patent protection does not apply to information that is kept confidential
- the release of details, required for patent registration, may assist competitors
- some intellectual property may not be eligible for other forms of protection.

Know-how can be protected by secrecy agreements. This is particularly effective in the case of chemical compositions and manufacturing processes where reverse engineering is either unlikely or excessively difficult. However, once a trade secret or confidential information has been transferred, it may lose value as further dissemination is more difficult to control.

Legal protection of confidential information is available under the common law principle of breach of confidence, which requires three elements to be satisfied.

- The information must be of a confidential nature. This means the information must not be public property or knowledge, though this requirement is less stringent than for a patent. If the information is generally known in a particular industry or discipline, it will not be considered to be of a confidential nature, even though outsiders may be unaware of it. Publicly available information that has been collected, arranged, or analysed through the effort and expense of a researcher may be considered protectable.
- The information must have some commercial value, though such value need not be great, a "significant twist or slant on a well known concept" has been held to be of value.
- The information must have been treated as confidential. This can be established by ensuring information is marked as confidential, physical access to information is restricted, and written instructions to staff, contractors, and others advising of the confidential nature of material are issued.

The law distinguishes between an employee's general know-how, skill, and experience acquired in the course of employment (referred to as subjective knowledge), and other information that a reasonable person (one of ordinary honesty and intelligence) would be expected to consider as the employer's property. Only the latter will be protected.

There must be an obligation not to disclose or use the information. Even without a specific contractual term, this obligation is generally accepted to exist in certain relationships such as those with:

- employees and former employees
- consultants and advisors
- partners
- those granted licenses.

Naturally, the most effective way of establishing this duty is a carefully prepared contract including appropriate and enforceable non-disclosure/non-use clauses.

There must be unauthorized use of the information to the detriment of the owner. This requirement could include the use of information to establish a competing project, to seek funding, etc.

Depending on the existence and nature of agreements between parties, legal action for breach of contract may also be a possible basis for legal action to restrain another from unauthorised use of information. An action for breach of confidence does not require a contract, though having one in place will generally make it easier to establish the required elements, and is, of course, prudent practice generally.

To avoid disclosing information via a conversation or discussion, it is always prudent to put confidentiality agreements in place for discussions of your research with other external parties.

A confidentiality agreement allows disclosure of confidential information without prejudicing the patenting process. Such agreements are often used to protect trade secrets and other confidential information; it gives a contractual right of control over your intellectual property. There are various issues regarding confidentiality agreements. Before issuing or signing a confidentiality agreement, always consult with your commercialisation office. For example, some agreements are written in such a way that they require the discloser to keep his/her own information confidential, which is usually not desirable.

Researchers may also be bound, after they complete a project or cease to be a university employee, not to disclose or use certain confidential information. This may be the case even if a confidentiality agreement has not been expressly entered into.

1.1.8 Passing off

Passing off is a 'common law' form of protection – that is, a legal principle that has been developed based on precedents established by previously decided cases concerned with similar facts. Passing off can protect a device or mark used by a trader, such as a name, a logo, aspects of packaging, or the general 'look and feel' of an item, even though these have not been registered (or are incapable of registration) as trade marks.

While relying on a passing off action may seem to have some benefits, such as not requiring registration and offering protection that may be broader than under trade mark legislation, there are some significant downsides. The challenges with a passing off action typically lie in establishing the existence of a reputation and proving some harm (or the likelihood of harm) has been suffered.

The other element required to establish passing off is some conduct that has misled, deceived, or confused third parties into making some association between the party's products or services.

1.1.9 Business names, domain names

Business Names

The mere registration of a business name – although it is a necessary requirement prior to conducting a business (under the various state Business Names Acts) and is one possible basis for supporting the registration of a domain name – confers no rights to use that registered name. One shortcoming of the business names registration system adopted by the states is that searches for similar/identical registered trade marks are not conducted prior to registration.

Domain Names

There are no proprietary rights arising from the registration of a domain name in Australia, or anywhere else in the world. A party who registers a domain name does not 'own' that name, but holds a licence to use the domain name, for a specified time period and subject to the terms and conditions set out by the administrators of .au domain names in Australia. These terms include restrictions on the transfer of the licence to use a domain name.

Domains with a .au suffix may only be registered where the registrant is:

- an Australian registered company; or
- trading under a registered business name in any Australian state or territory;
- an Australian partnership or sole trader;
- a foreign company licensed to trade in Australia; or
- an owner of an Australian registered trade mark; or
- an applicant for an Australian registered trade mark; or
- an association incorporated in any Australian state or territory; or
- an Australian commercial statutory body.

".com.au" and ".net.au" domain names must:

- a) exactly match, or be an acronym or abbreviation of the registrant's company or trading name, organisation, or association name or trade mark; or
- b) be otherwise closely and substantially connected to the registrant".

Furthermore: there is no hierarchy of rights with domain names, a registered trade mark does not confer any better entitlement to a domain name than a registered business name, and there are no checks by the domain name registrar to ascertain whether a proposed domain name is identical to or similar to any company name, business name, or trade mark registered by another party. Domain name licences are allocated on a 'first come, first served' basis. Provided the relevant eligibility rules above are satisfied, the first registrant to apply for a particular domain name will be permitted to license it.

The registration process is much more open with regard to top level domain (TLD) names, such as .com, .net, and .org. The registration of these domain names is regulated by the Internet Corporation for Assigned Names and Numbers (ICANN), an international non-profit corporation, not auDA, and there are effectively no pre-conditions for registrations of TLD names. Any party may therefore register a .com, .net, .org, etc. domain name that is similar or identical to an Australian registered trade mark.

Although there are some pre-conditions for the registration of a .au domain, registration is still a relatively easy process that requires, at a minimum, the registration of a business name.

Link to a more detailed overview

<http://www.theage.com.au/news/business/web-of-confusion-between-domain-names-and-trade-marks/2007/07/19/1184559956079.html>

1.1.10 Open licensing / open source

There is a movement, evident by a number of alternative approaches, to make intellectual property more 'free'. Not 'free' in the sense of 'a free lunch', but 'free' in the sense of 'free markets' or 'free speech'. It is sometimes expressed as the distinction between gratis (for zero price) and libre (freedom).

Two common examples of this approach are:

Creative Commons

Creative Commons is a nonprofit organisation established to make it easier for "people to share and build upon the work of others, consistent with the rules of copyright". The organisation provides free licence wording and other legal tools to "mark creative work with the freedom the creator wants it to carry, so others can share, remix, use commercially, or any combination thereof".

The terms of use under a Creative Commons licence are one (or a combination) of the following.

Attribution – a general license allowing all others to copy, distribute, display, and perform copyright protected work – and derivative works based upon it – provided acknowledgement of the creator is made.

Share Alike – a general licence allowing all "others to distribute derivative works only under a license identical to the license that governs the original work".

Non-commercial – a general licence allowing all others to "copy, distribute, display, and perform a work – and derivative works based upon it – but for non-commercial purposes only".

No Derivative Works – a general licence allowing all others to "copy, distribute, display, and perform only verbatim copies of a work, not derivative works based upon it".

See www.creativecommons.org

Open Source

Examples of open source are typically online content, such as www.wikipedia.org and community developed and supported software, such as the Linux operating system and the Mozilla Firefox browser.

This material is still covered by copyright law, as copyright protection arises automatically, but creators have granted wide (but not unlimited) licences for most uses of the material.

Only the owner of copyright material has the right to grant any licence (including licences such as those under a Creative Commons or open source model), so issues of ownership and the rights conferred under appropriate university IP policies must first be determined before considering granting any licence or other rights, either to specific persons or to the world at large.

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Module 4: Intellectual property and commercialisation

1.2 Protecting IP internationally

IP protection, whether under a registration system (such as patents, trade marks, designs, and plant breeders rights), other legislative regimes (such as copyright or circuit layout), or common law (such as passing off) operates on a nation-by-nation basis. Establishing protection in Australia, or another country, does not automatically create rights in any other country.

Each country assesses and grants IP applications independently and has varying requirements, protection, enforcement, processes, and fees. It is therefore not possible to obtain 'worldwide protection' through a single application. However, there are a number of international and bi-lateral treaties concerning intellectual property (including some that make filing in a number of countries easier), including:

- the Patent Cooperation Treaty (PCT) – this effectively establishes a crucial “priority date” in each member country, providing an opportunity at some future date to proceed to wider registration; it gives extra time to assess the value of an invention and its export potential before committing to the high costs involved in obtaining patents in numerous countries
- the World Intellectual Property Organisation (WIPO)
- the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)
- Free trade agreements
- Rome and Berne conventions on copyright
- Madrid protocol
- European Community schemes for trademarks and designs.

When disclosing or marketing an invention or design in Australia, it is important to ensure that the ability to patent or protect the design in another country is not invalidated. Under the above-mentioned international conventions, once protection is applied for in one country, it may also be applied for in other member countries, providing it is within the following time limits:

- Patents and plant breeders rights – 12 months from the date of the first application in a member country
- Designs and trade marks – 6 months from the date of the first application in a member country.

If an application is filed outside these time limits, the benefit of the international conventions cannot be realised and any earlier disclosure of your invention or design may invalidate the IP rights in other countries. It is also important to note that some countries are not members of these international conventions, and any publication or use can affect the applicant's ability to patent in those countries. Filing for international protection is expensive, particularly when it involves the translation of applications into other languages. In addition, each country will review the application through its own Patent Office, requiring fees to be paid and often requiring lawyers in those countries to be engaged at further cost.

Module 4: Intellectual property and commercialisation

1.3 Key issues in IP management

1.3.1 IP ownership (employees and students)

Intellectual property legislation generally provides that the creator of intellectual property is the owner of that property. However, the legislation generally provides that intellectual property created by an employee, in the course of their employment, is owned by the employer. It should be noted that the provisions in the legislation are generally default provisions, which apply only in the absence of any agreement to the contrary.

The practicalities of intellectual property ownership are usually determined by reference to contractual associations between the parties concerned, in addition to the provisions in the applicable legislation.

Where one or more people have been involved in generating IP, then the IP authorship may be shared; once again the specific allocation of shared ownership should be agreed by the parties and recorded in writing.

1.3.2 IP Ownership in a university context

All universities have policies regarding the ownership of intellectual property generated by their employees and students. As mentioned above, under Australian law, the IP generated by an employee is considered the property of the employer. This may also be true under a funding agreement, where the IP produced by the research resides with the funding body, not the original researcher; again this will be determined by the agreement between the funding body, the researchers, the university, and any other party involved. Such circumstances are often multi-party contract-based relationships that require specific legal advice, usually from the university solicitor's office, to assist in fighting the inevitable "battle of the forms" that can arise.

In the case of postgraduate students, most, but not all, universities will recognise the student as the owner of the IP that they generate through their research. However, if the university is employing the student to work in the area of study for which they are enrolled, the IP ownership may be dealt with on the basis of the student being a staff member. In the case of co-authoring, the rights of other parties must be taken into account. Students are increasingly involved in research involving contractual obligations.

Such obligations arise in relation to other universities, government, and industry. Cooperative Research Centres (CRCs) and ARC Linkage grants are some examples. In these cases, it is not usually possible to leave issues of confidentiality and ownership unresolved, as they could adversely affect the student's research, jeopardise the project, and expose the university to contractual liability. Consequently, there may be a need to formally transfer the intellectual property created by the student.

Most Australian universities have policies to share the net commercial profits of IP with the authors of the IP.

When entering into contracts (such as a research contract) with third parties, the ability of the university and its staff to negotiate arrangements about the ownership and utilisation of intellectual property is constrained. Where the university does enter into a contract with third parties, the obligations accepted by this process must be observed by all staff involved. In particular, such obligations may affect intellectual property rights and the ability to publish.

Researchers must make themselves fully aware of their rights and responsibilities under funding arrangements with regard to publishing and presenting at conferences, as sometimes the funding body has the right to publish before the researcher/team.

The early involvement of the commercialisation office and solicitor's office of the university can help ensure that these issues are managed and that the university retains ownership of the IP. Where possible, sharing of IP should be avoided as this complicates future attempts at commercialisation.

Cases

There are a number of recent cases involving IP in the context of the Australian university system, and these are summarised in the following pages.

Victoria University of Technology v Wilson [2004] VSC 33

Professor Wilson held a chair in Victoria University's Graduate School of Business, within the Faculty of Business and Law and was head of the School of Applied Economics. Dr Donald Feaver, a senior lecturer (who held an LLB and LLM), was the head of the Centre for International Business Research and Education (CIBRE), one of the units in the School.

The university had for some time undertaken teaching and research in the field of international trade. The Footscray Institute of Technology, the predecessor to Victoria University, was the first higher degree-conferring institution in Australia to offer a Bachelor of Business in International Trade. CIBRE was

established in 1998 with the purpose of identifying relevant and practical research opportunities through industry and government linkages. When it was established, CIBRE's main source of funding was envisaged to be the development and sale of online short courses.

Professor Wilson was contacted, in his capacity as an academic at the university, by a former student with a proposition that a company (of which the former student was a director) join with the university to develop the concept of an internet-based international trade exchange which would provide international traders and brokers with a way to transact their business through "a controlled electronic trading environment". The proposal included providing users of the on-line course in international trade to be trained and accredited to undertake trading transactions.

Professor Wilson and Dr Feaver responded positively to the proposal, and with the assistance of the former student, Mr Astill, commenced working on the project. Subsequently, the judge in the case found that this work was initially viewed by Professor Wilson and Dr Feaver as a university project. About 2 months into the project, Professor Wilson, Dr Feaver, and Mr Astill determined that they should personally, or via companies they controlled, assume ownership of the material generated and of associated opportunities. Patents were obtained for key elements of the package by a company owned by Professor Wilson, Dr Feaver, and Mr Astill.

The university took action based on a number of grounds, but mainly that the academics had breached their contract of employment under its intellectual property policy. The university claimed it was an express or implied term of the academics' terms of employment that all IP created in the course of their employment would be owned by the university.

This argument was not ultimately successful as:

- whereas the academics were engaged by the university to undertake research in the fields of economics and international trade, the work undertaken in developing the invention was not the sort of research envisaged by their terms of employment
- the university's IP policy had never been formally endorsed or brought to the attention of staff, so the policy was not considered to have been incorporated into the terms of employment and could not be relied on by the university.

The university also argued that the actions of the staff amounted to a breach of the general fiduciary obligations that employees owe to their employers. The court found that, in this case, the academics had indeed breached their fiduciary duty to the university. The academics had sought to profit from their position at the expense of their employer and their own commercial interests had come into conflict with the interests of the university.

University of Western Australia v Gray [2008] FCA 498

Professor Gray was an academic employed by the University of Western Australia, and terms of his appointment included a provision that he was "to teach, to conduct examinations" and "to undertake... and generally stimulate research among the staff and students". His area of expertise was the treatment of liver cancer. During his time as an employee of the university he developed novel cancer treatments using microspheres.

In 1997, Sirtex Medical Ltd, a public company (co-founded by Professor Gray while he was employed by the university) acquired the intellectual property rights in Professor Gray's novel therapies from him. Professor Gray subsequently became a director and substantial shareholder of Sirtex.

The university sued Professor Gray on a number of grounds. The university alleged that his transfer of the rights to Sirtex was in breach of an implied term in his employment contract. The university claimed this implied term had the effect of giving the university ownership of the rights to intellectual property in any inventions developed by Professor Gray in the course of his employment.

This claim by the university was rejected by the court. The court held that such a general implied term would not apply to academic staff performing research (even if they use university facilities) unless the staff have a specific duty under their contract to produce inventions. It was held that academic staff who are under a duty to do research do not necessarily have a duty to invent, as staff conducting research for a university have a choice as to whether or not they invent.

As in the Victoria University case, UWA also argued that their IP regulations, which allocate ownership of IP created by staff to the university, would be binding on Professor Gray. In this case, the court determined that these IP regulations were not within the power that the university had under its governing act, and so were invalid. The university only had the power under the University of Western Australia Act 1911 (WA) to make regulations concerning the control and management of its property. The court held that the university was not authorised by the Act to regulate the acquisition of property from (or interfere with the rights of) others.

Patents had been issued for the intellectual property in this case. The Patents Act, unlike some other intellectual property statutes that regard material created in the course of employment as owned by the employer (such as the Copyright Act), contains the general position that inventions belong to the inventor unless there is a contractual obligation on the inventor to produce inventions, separate from a duty to research.

The university's argument that Professor Gray had breached his fiduciary duty to his employer, in transferring the rights to the invention to Sirtex, also failed, as the court held that the university had "failed to establish that it had any rights or interests in any of the inventions even if they were made by Dr Gray or others in the course of their employment as researchers with UWA", so there was no breach of fiduciary duty by Professor Gray as the rights to the inventions were held to be his rights, not rights of the university.

The judge in this case, French J, also highlighted that universities have a unique status as employers, and made the observation that principles which apply in industrial settings have little application in an academic

context.

1.3.3 Managing IP on a daily basis

As mentioned previously, the ability to protect your IP can be affected if you have made a disclosure before the IP is protected. This may be via publishing a paper, giving a talk at a conference, or potentially even by having a discussion with a person who is not part of your institution.

i. Confidentiality agreements

To avoid disclosing information via a conversation or discussion, it is always prudent to put confidentiality agreements in place for discussions of your research with other people from other organisations. A confidentiality agreement allows disclosure of confidential information without prejudicing the patenting process. Such agreements are often used to protect trade secrets and other confidential information; it gives a contractual right of control over your intellectual property. There are various issues regarding confidentiality agreements. Before issuing or signing a confidentiality agreement, consult with your commercialisation office. For example, some agreements are written in such a way that they require the discloser to keep his/her own information confidential, which is not desirable.

ii. Material transfer agreements (MTAs)

Material transfer agreements (MTAs) are contracts that allow the sharing of research materials between two organisations. The recipient can then use these materials for research purposes.

An MTA clearly outlines the rights and obligations of the provider and the recipient in regard to the materials. These can include obligations of confidentiality and appropriate warranties and indemnities, usually to protect the provider of the materials from any legal action by the recipient. MTAs can also cover the transportation of materials to or from the university, and transport costs are usually the only costs that would be considered reasonable in an MTA.

MTAs are applied to materials such as:

- Biological materials (reagents, cell lines, plasmids, and vectors)
- Chemical compounds
- Other physical materials.

Each university will have its own process for managing the negotiation and signing of MTAs, but as a general point it is unusual for researchers to be able to sign them on behalf of their own university. This often takes place through legal or commercialisation offices.

iii. Keeping a laboratory notebook

Meticulous notes should be kept documenting the thought or discovery processes involved with your research. In most countries, including Australia, patents are granted to the first party to file a patent application. However, in the United States (which is one of the largest markets) patents are currently granted to the first party to invent, and a properly maintained laboratory notebook is vital for proving this. However, in a major change following new legislation, the US is moving to a 'first to file' system for all applications filed on or after 16 March 2013. This will help to harmonise patent systems across the world, and simplify the process of applying for patents internationally.

Even if research is not carried out in a laboratory, it is still essential to keep a detailed record of the work to provide the best evidence of the date of invention as well as corroborating evidence that the inventor was the first to invent. The intent of all entries is to prove in court facts such as conception of the idea and reduction to practice. Also, another researcher should be able to view the book and determine the nature of the project, the concepts considered and tested, test results, and the final conclusions. However, the notebook must comply with correct procedures to ensure a patent is granted. If lab book procedures are not followed properly, they may not be considered as proof when inventorship is being determined.

- A notebook should record what was done on a project and what inventions were made and when. The book should be permanently bound, with pre-numbered pages
- Entries should be permanent, complete, and continuous, and be signed, dated, and witnessed as soon as possible
- Complete every page in ink and in sequence, and cross out extra space
- Errors should be marked with a single strikethrough and initialled
- All letters, sketches, photos, charts, and printouts should be placed permanently in the book and also signed and dated.

Some factors that reduce the credibility of a notebook are:

- Illegible entries
- Unsigned or undated pages
- Unwitnessed entries or pages
- Missing pages
- Erasures and deletions.

With the advent of electronic notebooks, these general principles should still be adhered to, with respect of electronic signing and checking of records. For further details on this matter you should talk to your commercialisation office.

iv. Publishing

If research is published (either in a journal or a poster, in a presentation at a conference, or even in an annual report) before the IP is protected, it may not be possible to patent the IP; that is, the IP must be protected first. This can be done relatively quickly (within days or weeks) with a provisional patent. However, sometimes timing is an issue and a researcher may choose not to publish until the research is more progressed (to help secure a firmer patent and hence a better commercialisation position). Before publishing in any form, researchers are advised to discuss the issue with their commercialisation office to ensure they have their IP protected appropriately.

1.3.4 Costs associated with IP protection

Often in university research, a patent is sought to protect IP as it gives the highest level of protection in many markets. The cost of a patent, which grants the owner exclusive rights to the innovation for up to 20 years, is typically funded by the university, although most universities will be looking to find a commercial partner in the first couple of years to avoid paying very high patent costs. Patenting is the most expensive form of IP protection and can cost \$500,000 or more over the 20-year lifespan (excluding any legal costs involved in contesting a patent infringement).

The typical patenting process:

Patenting stage	Timeframe from filing provisional	Cost
Provisional	0 months	\$4-10,000
Patent cooperation treaty application	12 months	\$10-20,000
Application published	18 months	\$0
National phase filings	30 months	\$20-\$200,000
Patent prosecution	36-84 months	\$5-500,000
Renewal of applications and granted patents	ongoing	\$1-10,000 per country
Court challenge	years	\$1M+

At your university

Module 4: Intellectual property and commercialisation

Topic 2: Commercialisation and Translation

Introduction

This topic begins with an overview of the commercialisation process and an explanation of the benefits involved. It then looks more in-depth at what is involved at each stage, in particular the licensing versus start-up options. Sourcing funding for each stage is critical, but what funding is available and how is it secured? The researcher's attitude can make or break an investor's or funder's commitment to a project. Just how involved is the researcher in the commercialisation process? The topic looks at the researcher's various options, how an exit is made, and profit sharing. The topic concludes with some key issues including realistic timeframes and the role the market plays in success or failure.

Learning outcomes

After completing this module you should be able to:

- Understand what role commercialisation is given in your institution
- Understand the different commercialisation drivers for institutions, funders, and individuals
- Describe the broad commercialisation process
- Cite the pathways of commercialisation
- Identify sources of funding for commercialisation
- Distinguish specific roles researchers can play in the commercialisation process
- Outline the points at which a financial return can be realised
- Comprehend the revenue-sharing policy of your research institution.

Topic content

Commercialisation is the process of managing the transfer of research knowledge to where it reaches an application in the broad marketplace. The knowledge may be in the form of a research outcome or skills and expertise; the commercialisation outcome may result in the development of a product, technology, service or business, community development program, publication (such as a book), or consulting activities. Importantly, a successful university commercialisation venture should not only result in economic returns but also see research being applied to the benefit of communities and society in general. Each institution will have a different balance between impact in the community and generating revenue for itself. In this module, we deal primarily with the identification and commercialisation of intellectual property (IP) assets. Within a university context, commercialisation generally involves following one of a number of intertwined pathways:

- Consulting about the IP
- Forming start-up companies based on the IP
- Licensing the IP to a third party
- Collaborative research and development of the IP.

While research commercialisation is frequently associated with technology-based disciplines such as science and engineering, it is becoming increasingly common to successfully commercialise research from all disciplines including social sciences and the arts. The differences in commercialising research from the different disciplines usually reside in the form of IP protection necessary, the packaging of the research into a product or a service, and the commercialisation pathway. Some of these different approaches are highlighted in the case studies included as additional reading.

Why commercialise? Commercialising research, or "knowledge transfer", can provide tremendous benefits for society as well as the researcher and his/her research institution. The range of benefits for individuals, institutions, governments, and funders can include:

- The satisfaction of bringing benefits to society, such as creating jobs, curing a disease, or solving a problem for industry or society in general
- Seeing your research translated into real products and services in everyday use
- Developing policy in use by governments and other organisations
- Personal economic gain (refer to the revenue-sharing incentives offered by your university)
- Expanded career options as well as enhanced 'employability'
- Professional development and peer recognition
- Funding for further R&D efforts
- Breaking free of the competitive grants cycle
- Meeting national economic, social, and political imperatives
- Meeting the requirements of a funding body

- For organisations such as CRCs and charities, meeting the specific objectives set out in their formative charter.

It is important to think through what motivates you as an individual, as well as what motivates your institution and those who may fund your research. Success is most likely when these motivations align, and when the expectations of the different parties are clearly expressed.

We will examine the commercialisation process further in the following sections:

2.1 Commercialisation process – an overview

2.2 Stages and pathways

2.3 Funding

2.4 Role of the researcher

2.5 Realising a return

Activity 3 – Research project reflections

When you have completed reading all the content of Topic 2, reflect on a project you are (or have been) involved in. Make a note of your responses to the following questions and bring them with you to the workshop.

1. List the potential benefits of your research for the end user.

2. What stage in development is your innovation? (select all that apply from below)

- Basic research
- Mid-stage research
- End-stage research
- Pre-clinical trials
- Clinical trials
- Proof-of-concept testing
- Prototyping
- Product development
- Service development
- Other

3. What might you be commercialising?

- Physical product
- Technology
- Service
- Business
- Something else?

4. What stage is your innovation at in the commercialisation process?

- Research and discovery
- Disclosure
- Evaluation
- IP protection
- Proof-of-concept
- Commercial pathways and resourcing:
 - licensed
 - start-up company
 - consulting
 - research collaboration

At your University

Module 4: Intellectual property and commercialisation

2.1: The commercialisation process – an overview

There are no set rules for commercialising university research – only guidelines, as each project will have unique characteristics. This could be as a result of the research itself, the market it addresses, the institution, the researcher, the funders of the research, the investors or funders of further research, or a range of other factors. However, there are a number of common themes, and most university commercialisation offices will follow a process such as the one outlined in Table 4.1. While represented as a linear process, few commercial ventures proceed from stage 1 all the way to stage 8, and even fewer will do so in a linear manner. For example, unexpected research outcomes may send a venture back to an earlier research stage, or a change in market conditions may force a re-evaluation of the potential venture.

Table 4.1: The Commercialisation Process

Commercialisation stage	Research stage	What is involved
1 Research and discovery	Fundamental	Research
2 Disclosure	Fundamental	Innovation disclosed to university commercialisation office
3 Evaluation	Fundamental	Evaluation of the research for commercial potential; Development of a commercialisation plan. Key questions addressed include: <ul style="list-style-type: none"> • What is the product and what benefit does it offer? • Can the IP be protected? • Who is the competition? What is the competitive advantage? • Who are the customers? • What is the size of the market and what are the market dynamics? • What is the time to market? • How much funding is required to take the product to market?
4 Intellectual property (IP) protection and packaging	Fundamental	Protection and packaging of IP for commercial opportunities
5 Proof-of-concept	Prototyping/ Pre-clinical	Demonstration that the innovation 'works' by measures that external partners deem appropriate.
6 Commercial Development		This may involve the formation of a start-up company or licensing the IP to an existing business. Further collaboration may occur with the original research provider.
7 Value adding	R&D/clinical	Continued research and development to refine the product for the market and potentially develop additional products. This stage may involve testing and refining the product for market readiness; may develop the business further.
8 Returns		Realisation of capital value of the company for the inventor and investors. This may be a public offering, sale of a start-up company, or the payment of royalties or other consideration from the licensing of the IP.

The commercialisation process is a difficult one, involving long time-lines, and very few innovations go on to become major international successes. Some innovations have enormous intellectual value as pure research but for a range of reasons are unable to be commercialised. These are not necessarily related to the innovation itself, but may result from many factors, such as changes in the market, changes in the commercial focus of the commercialisation (licensing) partner, technical failure, regulatory change or failure, inability to raise necessary finance, and many other reasons.

It is important to note that if research cannot be commercialised, this is not a reflection on the quality of the research itself. It has been estimated that for every 3000 raw ideas generated about 300 are disclosed to a commercialisation office. From these, about 125 or less are taken forward to be commercialised and result in 9 early-stage developments which in turn lead to 4 major developments, about 2 product launches, and ultimately just 1 successful business (Stevens, G. A. and Burley, J. (1997). 3000 raw ideas = 1 commercial success!, *Research Technology Management*: 40(3): 16–27.)

Commercialising research is not a process that can be undertaken by the individual researcher in isolation. Due to the complexity of the process and the costs involved in protecting and developing a product for the market, it is necessary to take on intellectual and financial partners at various stages. These partners include the university commercialisation office; patent attorneys and consultants; solicitors and accountants; research partners and managerial staff; entrepreneurs; and potential sources of funding such

as venture capitalists or angel investors or perhaps even shareholders and company directors.

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Module 4: Intellectual property and commercialisation

2.2: Stages and pathways

As discussed in the previous subtopic, there are 8 key stages in the commercialisation process (see text box opposite). The researcher and the university commercialisation office may be intimately involved in all 8 stages. The level of involvement for the entire process will depend on the commitment and resources of the researcher and the commercialisation office as well as the commercialisation pathway undertaken. However, it can be generally expected that the researcher will work closely with the commercialisation office from the disclosure stage through to the commercial pathways stage. It is very hard to successfully commercialise the type of early stage technology developed in a university without the involvement and commitment of the researchers who initially developed the IP.

In this section, the stages are discussed in more depth.

Commercialisation stages

- 1 Research and discovery
- 2 Disclosure
- 3 Evaluation
- 4 Intellectual property (IP) protection and packaging
- 5 Proof-of-concept
- 6 Commercial development
- 7 Value adding
- 8 Exit

2.2.1 Disclosure

Disclosure is, as the name suggests, the confidential revelation of an innovation or idea. While ideally a researcher discloses their research early in its development, a disclosure can be made from the point of concept to the final stages of research and development. Ideally, the disclosure should contain all the information necessary to start the evaluation process, although that may not all be available at the start of the process. Most universities will want their researchers to disclose as early as possible as this will enable the commercialisation office to provide the best advice in a timely manner, and also allows the most flexibility in terms of publishing and patenting. The types of information required in a disclosure are:

- Inventors/originators/developers
- Not necessarily from host institution
- Description of invention/innovation
- Source of funding
- Advantages over existing competition
- Past or proposed publications
- Potential partners where already identified
- Potential market or use

2.2.2 Evaluation

After receiving a disclosure, the university commercialisation office will work with you to assess an innovation for its commercial potential. Extensive searches of academic and patent publications are conducted to define whether the innovation is unique or novel, its overall competitive advantage, and its marketability. It is also important to try and understand the scope of any IP protection that might be claimed, as this can have a significant impact on its value. The following questions are typical of those asked when undertaking an evaluation of IP.

The IP: what is it and how is it beneficial?

- What is the technology/innovation?
- How will the research benefit the community, industry, or business?
- Can the IP be protected?
- Could potential infringement of the IP be detected?
- What scope of IP protection might be expected?

The IP contained within the research may be a compound, device, process, manufacturing method, or a service and it must offer a significant benefit for potential consumers. Additionally, it must be possible to protect the IP.

The product: what is it and is it of value?

- What type of 'product' would the innovation be? That is, what will users want to spend money to buy (e.g. software program, vaccine, pharmaceutical drug, book, or community program)?

- Can you identify who would pay money for the innovation and why?
- How big might the impact of the technology be?
- Who is the competition? That is, what is available that is the closest product/service/technology/business available that would compete with the product?
- What is the competitive advantage over existing products or services in this space?

When it comes to a commercial opportunity, scientific value is necessary but not sufficient. The IP must offer a clear solution to a well-defined problem or issue and the application must have an advantage over existing products. Critically, there must be a 'market need' (that is, would customers be willing to pay for it?) and for this the IP's 'unique selling point' needs to be identified.

The market

- What is the need for the improved technology?
- How long will it take to develop the research to a product that consumers or other end users can purchase?
- Who are the customers (identity, preferences, needs)?
- What is the size of the market addressed by the innovation for the product and what are the market dynamics like?
- What is the expected resource and funding required for taking the product to market?
- What is the availability of industry or investment partners to help fund and or develop the product?
- Are there significant barriers (financial, regulatory, technical, political) for new market entrants?
- Is the industry receptive to new innovation?

Ideally, the market should have a large growing customer base with a demand for the 'product'. There should be no barriers to entering the market; the market may cover different geographical locations; and there should be the ability to make a profit from the sale of the 'product'.

The cost of development

When assessing the commercial potential of an innovation, it is necessary to weigh up the costs of commercialising the research against the potential returns. As a general rule, the larger the potential return the more risk that will be accepted. However, different parties in the commercialisation process will have different access to resources and different attitudes to risk, and these need to be considered. Key costs are:

- Cost of development
- Time to market
- Cost of sales (marketing and distribution)
- Risk
 - Technical
 - Market
 - IP
 - Commercial
 - Financial
 - Key person

Other factors taken into consideration:

- People: the research (and commercialisation) team needs to be passionate about the project and committed to taking it to the market as well as able to work with investors/industry collaborators.
- Growth: potential for rapid growth and scalability; a clear business strategy for growth; and a global vision.
- Business model: is it a well thought through and articulated business model with identified customers who are willing and able to pay for the product. Early cash flow is viewed as highly advantageous and a clear path to positive cash flow and profitability must be mapped out.
- Exit for venture investors: clear path(s) to possible exit; creation of significant royalties; value creation.

2.2.3 Proof-of-concept

Early stage research often lacks critical data to prove that it will work in an industry setting. Such qualifying research is often pivotal to securing investment or other funding. Known as 'proof-of-concept', this stage requires close assessment and a reduction of the technical and market risks associated with the project. These activities may be carried out by the research team, or by the commercial partner, or as a collaboration between the two parties. Essentially, the research team needs to provide convincing evidence that their research has market potential, as defined by the potential commercial partners. This may involve conducting a key experiment, building a prototype, or performing critical market research. Commercial input, termed "voice of market" is often very valuable at this stage as it will help determine how to achieve the type of proof-of-concept that industry wants to see. This may not involve any technical advance but, depending on the industry, there may be a range of key risk factors that they would wish to see resolved. These might include:

- Comparisons with "gold standard" products or processes
- Specific technical specifications met
- Scale-up issues identified or solved
- Prototype developed
- IP and freedom-to-operate issues addressed

- Understanding cost of goods.

Only by talking to potential partners will it become clear what their issues are as they decide whether or not to take on your innovation.

2.2.4 Commercial development

IP and innovation can be commercialised via many pathways. The pathways often considered are licensing (either directly or through an option), forming a start-up company, consulting, or conducting collaborative research. Other options include assigning IP to a third party or research collaborator, or entering into a joint venture. In general, the greater the commercial risk involved in the pathway, the greater the potential profits (see table below). It is worth noting that these profits are not necessarily distributed evenly, and should take into account the contributions of all the parties necessary to make the commercialisation process a success.

Table 4.2 Quick comparison between models

	Risk	Profit	Control	Management
Assigning IP	small	low-high	none	none
Consulting	small	low-medium	low	low
Licence	medium	low-high	low	low
Joint venture	med	medium-high	Medium - high	high
Start-up	high	none-very high	according to equity, usually low	depends

When choosing between the potential pathways, a commercialisation office will first consider what the objectives of all the different parties involved are, particularly in terms of financial return, potential to achieve impact, resource implications, and risk management. It is important to discuss these early on in the process and aim to maximise alignment of the different parties (and understand the differences between them). Other considerations include evaluating the market, competition, funding requirements, stage of development, and investor appetite.

The two commercialisation pathways that are traditionally the most common at universities, both in Australia and internationally, are licensing or forming a start-up company. As a very rough average, universities typically expect to license 10 technologies for every one spin out, although this varies depending on a range of local factors. Over recent years, less direct routes – such as consultancy and research collaboration – have played an increasingly strong role in the process of translating university research into successful products and processes. It is also more common to see a combination of different pathways, so there may be a licence together with collaborative research back in to the lab that developed the original IP. These pathways are examined in more detail in the following.

The licensing pathway

The 'licensing pathway' involves granting a third party permission to exploit intellectual property without transferring ownership of the IP. The licence is a legally enforceable contract, which creates rights, duties, and obligations for both parties. The terms of a licence are flexible and are generally negotiated on a case-by-case basis.

Licensing IP has the advantage of being a relatively inexpensive pathway, which provides a return with minimal outlay. Depending on the contractual arrangements, the licensor may retain some control over the IP and place limits on the licensee's involvement in exploitation. It also may allow the licensor to overcome foreign barriers such as the inability of the licensee to enter overseas markets due to lack of capital or resources for expansion.

However, licensing generally results in lower returns to the licensor than direct commercialisation because the licensor will only ever receive a percentage of the value added by the licensed IP. This value is returned in a range of payments in consideration for the grant of the licence and can include:

- Upfront payments
- Annual fees
- Royalties on sales
- Percentage of sub-licensing income
- Payments on meeting milestones
 - Technical
 - Regulatory
 - Commercial

The rate of royalties varies significantly by industry and stage of development of the IP towards a marketable product or process. It is often in the 1–5% range of net sales, although it can be higher or lower in specific circumstances.

Risks associated with licensing include:

- Higher than expected administration costs associated with
 - Negotiating complex licence deal terms
 - Monitoring licensee compliance
 - Meeting licence obligations
- The licensor may have minimal control over the IP management
- The licensee may not perform, resulting in the underdevelopment or shelving of the IP.

When licensing, the burden of effort and risk generally rests more heavily on the licensee because they

assume the costs of developing the research into a product and then delivering it to the market. As such, when negotiating a licensing contract, the lower the risks associated with developing the research, the greater the consideration for grant of the licence that can be negotiated.

When licensing IP, it is important to research the potential licensee. The licensee must be capable of technically, commercially, and financially developing the IP into a product and then have the capability and commitment to market it, as well as be capable of defending any patent infringement. It is important to ensure the licensing contract is reviewed by legal and commercialisation professionals. They will be examining a range of variables in the contract including:

- Exclusive/non-exclusive licence
- Fields, territory of use, term of licence
- Performance requirements on all parties
- Returns via royalties, milestone payments, and annual maintenance fees
- Percentage from sub-licence fees
- Leverage for research funding
- Retention of research rights and publication rights
- Warranties
- Termination.

The start-up company pathway

A start-up company is a newly formed company with rights to commercialise the intellectual property. The company's management and board will raise funds to strategically develop products from the IP.

An advantage of this model is that funding for further research can be secured outside the regular university funding structure by accessing pre-seed capital, seed venture capital, or angel investment. Additionally, this pathway can provide the potential for greater return through research, as the inventor's lab is often the best place to carry out the additional research by the company (although this will tend to change over time).

A start-up is a high risk, however. It is heavily dependent on successful research outcomes, a receptive market, human resources (and commitment), as well as financial variables. There are the risks that no one will invest, or only invest on terms not acceptable to all parties; the research fails to deliver the expected results; returns are lower than anticipated; and that you have to cede control to investors. For commercialisation offices, start-up companies also require more human resources to successfully start and manage, and they must comply with corporate governance regulations as well as cope with taxation consequences.

Key points for the researcher to note about a start-up company are:

- The university licenses the research IP to the start-up company most commonly for a nominal up-front fee and shares in the company
 - It is not unusual for this licence to convert to an assignment on the company reaching milestones such as raising capital or selling the business
- The general model is for the start-up company to contract the university research team to undertake further research and development of the IP.

The consulting pathway

Whether undertaken via the university commercialisation office or independently, consulting provides academics with invaluable opportunities to expand their research and commercial horizons. Benefits include:

- Testing your intellectual capabilities in government and industry sectors
- Disseminating ideas, models, and research outcomes outside academia
- Opportunities to generate additional research data
- Consultant/client relationships often create new research opportunities
- The opportunity to give something back to industry and the community.

Consulting can range from a straight forward contractual arrangement through to forming a consulting business. Commonly, university researchers are contracted to perform specialised R&D or testing of projects for clients; undertake technical consultancies; or provide expert opinions for legal cases.

When undertaking a consulting contract it is essential for the researcher to ensure that they have appropriate insurance and that their contract is reviewed by a consulting or legal professional. The latter is particularly important to ensure that the contract facilitates the development and protection of intellectual property developed from consulting.

Undertaking consultancy for a company is often an excellent first step in developing a relationship that can lead to additional research or potential licence deals in the future. Companies have a strong preference for working with researchers with whom they already have an existing relationship.

Examples of commercial pathways

The following case studies are examples of university research, from a range of disciplines, which have been successful commercialised via these three main pathways.

- [Gardasil](#)
- [QRxPharma Ltd: a start-up company case study](#)

- Triple P (Positive Parenting Program), an example of a university consulting business and licence
- Historico, an example of a university consulting business

At your university

Pursuing the topic further

Below are links to the Office of Technology Licensing at Stanford University and the Technology Licensing Office at MIT. While university technology transfer has a legal impetus in the US, Stanford and MIT have been extremely successful in commercialising their innovations and their sites contain several articles describing successful licensing of university technology as well as the formation of start-up companies.

<http://otl.stanford.edu/>

<http://web.mit.edu/tlo/www/index.html>

Other useful sources are Knowledge Commercialisation Australasia (KCA), the peak body for commercialisation offices in Australian and New Zealand: <http://www.kca.asn.au/>

The Association of University Technology Managers (AUTM) in the US <http://www.autm.net/Home.htm>

The Association of European Science & Technology Transfer Professionals (ASTP) <http://www.astp.net/>

PraxisUnico (UK) <http://www.praxisunico.org.uk/>

Licensing Executives Society <http://www.lesi.org/>

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Module 4: Intellectual property and commercialisation

2.3 Funding

In Australia, commercialising university intellectual property can be more difficult than in the large economies of North America and Europe. The development of early-stage research into market-ready 'products' is a high-risk venture and the number of Australian companies and investors willing to take on this risk is limited. Funding the commercialisation process is easiest in the early-research stage and towards the end of the process when the risk levels significantly decrease and it is easier to engage with international companies and funders. While sourcing funds is most difficult in the proof-of-concept and early start-up company stages, it is also the greatest rate-limiting factor at these two stages.

2.3.1 Research and discovery

There are numerous sources for research funding at this stage, generally in the form of competitive grants administered by the Australian government. Detailed information on the different grant schemes accessible to researchers can be accessed from your university.

In addition, R&D funding may be channelled back into research programs by start-up companies for the discovery or development of new products for their pipeline.

2.3.2 Evaluation, and IP protection and packaging

The cost of evaluating a research project and protecting the valuable IP is almost always met by the university or its commercialisation office. These costs may be recouped from any eventual profits realised from the IP.

2.3.3 Proof-of-concept

Proof-of-concept is often essential for research projects to attract investment or a licensing contract. However, research requiring proof-of-concept is frequently too advanced for government research grants and too early, or unproven, for investment.

Many projects can stagnate at this point due to a lack of funding and as a result, commercialisation professionals often refer to this stage as "the valley of death". This has been recognised as an issue at the institutional, state, and national levels. Many universities have now set up their own proof-of-concept funds that are usually administered through the commercialisation office.

The establishment of Commercialisation Australia, an initiative of the Australian government, was also a recognition of the issues surrounding this stage of the commercialisation process. Commercialisation Australia was able to provide matching funding in four separate options, depending on requirements and stage of development. These were:

- Skills and Knowledge
 - Up to \$50,000 to access specialist advice and services
- Experienced Executives
 - Up to \$350,000 to engage a CEO or other senior executive
- Proof-of-Concept
 - \$50,000 to \$250,000 to prove the commercial viability of new IP
- Early Stage Commercialisation
 - \$50,000 to \$2 million to take a new product, service, or process to market.

Following the 2014-15 Federal Budget, the Commercialisation Australia program was closed to new applications and the Government announced the establishment of a new \$484.2 million Entrepreneurs' Infrastructure Programme and a new streamlined Single Business Service initiative to support businesses to improve their competitiveness and commercialise new ideas. More details about this programme are available in the Minister's media release <http://minister.industry.gov.au/ministers/macfarlane/media-releases/building-globally-competitive-economy>

2.3.4 Commercial development

From this point, the researcher and the university commercialisation office are only involved in securing funding for the commercial development of research in start-up companies. Funding may become more readily available as the research is developed and the risk profile decreases. Investors in general look for companies with the potential for significant growth and which are driven by a committed, professional business team with a clearly defined exit strategy. An informed, committed, realistic and passionate researcher is essential for most investors.

The types of funds from which investment is sought are:

- **Pre-seed and seed funds** invest in companies with very early-stage research. In Australia, there are a few companies operating in this space.

- Uniseed Pty Ltd (a joint venture pre-seed fund between the University of Queensland, the University of New South Wales, and the University of Melbourne)
 - Trans Tasman Commercialisation Fund (a collaboration between Monash University, UniSA, University of Adelaide, Flinders University, and Auckland University)
 - ANU Connect Ventures (ANU)
 - Medical Research Commercialisation Fund (MRCF), a collaboration of medical research institutes, often with university links.
- **Venture capital (VC) funding:** Funding for university start-up companies is sourced from Australian and overseas venture capital funds specialising in early stage technologies. Some companies (mainly multi-nationals) also have investment funds for emerging technologies in their field. The majority of venture capital funds in Australia specialise in particular technology fields and late stage technologies. Further details can be found from AVCAL (<http://www.avcal.com.au/>), the peak body for VC investors in Australia.
 - **Angel Investors:** Angel investors are individuals who invest in early stage companies, and typically invest time and money to help make these ventures successful. Rather than invest solely on their own, they are frequently forming syndicates of like-minded individuals who will often invest as a group, thereby diversifying their risk and increasing the size of investment available. There are a number of groups based usually in the capital cities with details available through the Australian Association of Angel Investors (AAAI) <http://www.aaai.net.au/>

Seed, angel, and VC investors expect to make a return from their investments, usually looking to sell their shares in the company within 5 to 7 years. In addition to providing equity capital, they will look to add value to the company through their management expertise and access to networks and further capital.

2.3.5 Value adding

Funding for this stage can be sourced more readily through additional investment from venture capital funds, industry partners, or listing the company on the stock market. Alternatively, funds can be raised through the early sale of product or the licensing of the IP to companies in overseas territories in which the company does not intend to operate.

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2.4: Role of the researcher

Commercialisation is a complex and often lengthy process. All projects experience delays caused by a myriad of factors including problems in the R&D stage, lengthy negotiation periods, lack of investment capital, market changes, changes in business focus of partners, and the emergence of new competitors. As such, a successful outcome depends on the researcher's long-term commitment. Often successful outcomes can be directly linked to the long-term commitment of the research and business teams.

Commercially successful researchers are committed to commercialising their project. They have an external focus and recognise the trade-off between control and accepting additional value (in investment and resources). In addition, they are compelling communicators and self-critical (aware of their strength and weaknesses). While the commercialisation pathway is unique for every case, there are specific roles the researcher can play.

Commercialisation stages

- 1 Research and discovery
- 2 Disclosure
- 3 Evaluation
- 4 Intellectual property (IP) protection and packaging
- 5 Proof-of-concept
- 6 Commercial Commercial development
- 7 Value adding
- 8 Exit

From discovery to the commercial pathway stage, the researcher will need to work closely with the University's commercialisation office to:

- Fully disclose new technologies at the earliest opportunity
- Ensure the research program is structured to achieve a commercial outcome
- Protect the IP by working with the university and patent attorneys to draft and lodge patents where appropriate
- Undertake further research on which to base a patent and provide the information necessary to complete final patent filing
- Answer technical queries posed by interested parties
- Undertake the appropriate R&D, particularly in the proof-of-concept stage to meet investor/licensee requirements
- Write or assist in writing appropriate parts of the documents required to proceed with the commercialisation strategy
- Help 'sell' the IP by developing and delivering presentations on the technology in association with the university commercialisation office
- Undertake further research and support the commercial partner's activities where appropriate

The researcher is critical to the success of a commercial project. Not only do they play a unique role, but their passion and commitment to a project can make the difference between securing and losing an investor.

According to Australian venture capital investor, Michael Quinn [Quinn M. (2001). Bridging the Commercialisation Chasm. *ABC Radio National: The Buzz*], investors invest in the passionate researcher first and the promising project second because: "1 per cent of the cost, the experience and the dollars are in the inspiration, and 99 per cent is in the perspiration to get it to the marketplace..."

In Stage 7 and Stage 8, the researcher's role can include the following:

- Principal scientist within a university
- Chief executive officer (CEO) of start-up company
- Chief scientific officer (CSO) of start-up company
- Advisory board member
- Board member of start-up company
- Receiver of revenues.

The role taken on by the researcher should reflect his or her strengths. For the success of the venture it is important that the researcher is realistic about these. For example, a new company seeking to list on the stock market will have the greatest chance of success with an experienced CEO at the helm and the researcher, as the CSO, driving the development of the company's products – rather than the researcher being the CEO. Whatever the role of the research, an ability to 'enjoy the ride' helps!

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2.5: Realising a return

In general, universities recognise that staff and students need incentives to create valuable IP and, when they do so, to reward their innovation. The majority of Australian universities have policies for sharing the net proceeds of commercialisation with their researchers. The university will have policies in place to ensure that the net proceeds of commercialisation are distributed to the contributors. The exact distribution will vary by university and you should contact your university commercialisation office for details as to how it works.

The amount and timing of financial returns received from a commercialisation venture depends largely on the commercialisation pathway chosen (see [Table 4.2](#) for a quick comparison between models). The most common forms of return from a commercial venture received by researchers include the following:

- Start-up company pathway:
 - R&D milestone payments
 - 'Product' sale
 - Dividends from shares in company
 - The sale of shares/holding in company
- Licensing pathway:
 - Royalty revenue from the sale of a licensed product
 - Milestone payments
 - Annual licence fees
- Consulting pathway:
 - Consulting fees

An 'exit' from a start-up company occurs when the shares in that company are sold. These shares may be held by the individuals themselves, or by the university (usually through some sort of trust) with advantages and disadvantages to each model. However, there are a range of points at which the shares in the start-up company may be sold:

- When there is a 'liquidity event' enabling the shareholders to sell (liquidate) their shares, such as when there is a trade sale and the company is acquired by a larger company
- When the company lists on the local or an overseas stock market.

The point at which shares can be sold may be constrained by escrow, which prevents the sale of all or a percentage of their shares for a set period of time after the company lists or is taken over. This is common practice to avoid the sale of a large number of shares adversely affecting the share price.

The timing of the exit is crucial to maximising return. For example, if the sale is too early, you can miss out on the value uplift as the company's risk profile decreases. Alternatively, there is always the risk of selling too late when a company's value is eroded. However, it is rarely possible to exit within 5 years of forming a company.

Optional activity: Read the examples of successful commercialisation ventures

Click on the following links to read about some of the most successful commercialisation ventures from universities:

Gatorade

The drink that now dominates the sporting industry was developed by physicians at Florida University to help their football players cope with the heat.

<http://www.gatorade.com/history>

Google

Co-founded in 1998 by two computer science PhD students at Stanford University (Stanford University was involved in licensing the technology into a start-up). http://en.wikipedia.org/wiki/History_of_Google

Other successes

The Association of University Technology Members has compiled a collection of university commercialisation success stories. "This collection of short stories, supplied through the years by AUTM member institutions, explains how products derived from academic research and technology transfer which are used in medical

practice, environmental protection, agriculture, electronics, safety and many other fields." The collection, which includes stories from the U.S., Canada, and the U.K., can be searched by research discipline at the following link: <http://www.betterworldproject.org/>

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Module 4: Intellectual property and commercialisation

Dictionary of terms (IP and commercialisation jargon)

**Definition or part thereof derived from the Concise Oxford Dictionary*

Term	Definition
Angel investor	An individual who invests his/her own private money into a start-up company or technology at a very early stage. They take a large risk with their investment and often take a management role. Angels may be wealthy entrepreneurs or family or friends of the inventor.
Background IP	Refers to the intellectual property (IP) including know how that exists prior to entering into discussions with a third party.
Business plan	Written to define your business, identify your goals, allocate resources, focus on key points, and prepare for problems and opportunities. When embarking on a new venture, a business plan is frequently written to help those involved, including potential investors, decide if the venture is worth pursuing. Business plans generally include descriptions or analyses of the company, the product or service, market, forecasts, management team and the finances (balance sheet, income statement and cash flow analysis).
Circuit layout rights	Form of intellectual property protection which automatically protects original layout designs for integrated circuits and computer chips. While these rights are based on copyright law principles they are a separate, unique form of protection.
Commercialisation	The pathway to deriving a financial return from Intellectual Property (IP). The IP should be protected before commercialisation begins. When commercialising a technology, the university's commercialisation office/company will generally either licence the technology to an established company with a strong market presence or form a start-up company. It should be noted that not all innovations can be commercialised. Some innovations have enormous intellectual or social value as research but no marketable value.
Confidentiality agreement	Form of intellectual property protection. Also known as CDA, or Non Disclosure Agreement. Putting a confidentiality agreement in place with a prospective collaborating organisation and is intended to protect the confidentiality of the technology and allows for a detailed discussion in a sound commercial framework.
Copyright	Form of intellectual property protection (for more information, refer to the definition for Intellectual Property).
Disclosure	Revelation of intellectual property. Disclosures should be made in confidence only to select individuals involved in the commercialisation process. Disclosures can be made in the final stages of research and development or when they are still a concept or idea.
Discovery	Refers to a breakthrough in research or disclosure of something previously unknown. It is also the process by which a disclosure is revealed.
Due diligence	The complete analysis of a business or technology opportunity, including risks, value and the accuracy of information supplied before recommending it for investment. This process ensures that all relevant information has been disclosed to prospective investors. It is often undertaken by the investing company's underwriter and accounting firm. As well as reviewing all documentation and financial records, they will speak with management about the company's (or technology's) prospects, strategy, products, competitors and financial statements.
Equity*	Stocks and shares owned in a company which don't bear fixed interest.
Evaluation	Assessment of an intellectual property disclosure, based on the strength and level of advancement of the research, its uniqueness, competitive advantage and marketability. Also, the ease with which the innovation can be developed into a saleable product and how large a market it could capture may be examined.
Exit	Point of leaving an investment, generally the selling of shares in a company.
Foreground IP	Also referred to as Project IP, this is intellectual property (IP) developed during a project (as opposed to Background IP).
Goodwill	An intangible asset that is valued according to the advantage or reputation a business has acquired (over and above its tangible assets). It represents the value of factors that are anticipated to translate into higher earning power.
High Net Worth investor	Similar to an angel investor, except that they do not tend to take a major role in the management of the venture.
Infringement	When someone uses (i.e., makes, uses, sells) a property right owned by another without their permission.
Initial Public Offering (IPO)	This refers to the floating of a company on the stock exchange – their first sale of stock to the public.
Innovation*	To make changes or make novel. Innovation and technology are used interchangeably to describe an invention or research result that has commercial application.
Intellectual property (IP)	The term for the property rights covering innovations, discoveries, creations or any other original products of a human's intellect. Intellectual property can be protected by: <ul style="list-style-type: none"> i. Copyright – for literary works, art, music and software ii. Trademarks – for company and product names and logos

	<p>iii. Patents – for inventions and processes</p> <p>iv. Trade secrets/Confidentiality agreement – for recipes, code, and processes. They are used when the innovation's nature would make a patent difficult to obtain or it would be almost impossible to duplicate</p> <p>v. Circuit layout rights</p> <p>vi. Plant breeder's rights/Plant variety protection certificates</p>
Inventor	Person or persons who thinks of, finds, discovers, or creates a product, device or process (for legal purposes this will include anyone whose intellectual contribution was essential to the development of the invention).
License	A contract in which an IP owner grants a company permission to make, use, or sell the IP. This is not an assignment of ownership and does not give the licensee legal title to the IP. Licenses may be exclusive or non-exclusive (if multiple groups are licensed to use it). Licenses may be bound by a range of parameters, including set time periods (which may include the length of the patent), by territory (such as Australia only or USA only), or by field of use (such as research or a given market segment). Generally there is a licensing fee charged by the owner of the IP and/or a right to a percentage of the profits (royalty stream).
Materials Transfer Agreement	Form of intellectual property agreement. This governs the transfer of biological or other material between two parties. Generally the intellectual property owner retains ownership rights to the material, and restricts the other party's use to research, or in the case of a company, evaluation prior to entering into commercialisation arrangements.
Market	<p>i. Location where goods are bought and sold</p> <p>ii. The total demand for a commodity</p> <p>iii. The customers (actual and potential) for a good or service</p> <p>iv. The process by which buyers and sellers interact to determine prices and quantities</p> <p>v. Marketing: selling of a product</p>
Milestone	Markers of achievements within a project. Milestones are established to help progress a project on budget, on schedule, and to achieve specific goals. Milestones are identified at the commencement of a project, agreed to by contract, and are frequently tied to injections of further capital or performance payments.
Monetise	Used in connection with a royalty income stream from a licence, where the future income from that license is sold (wholly or part) to a third party for a payment, usually of cash.
Moral rights	<p>Moral rights are the rights individual creators have in relation to copyright works or films they have created. Moral rights are separate from the 'economic rights' of the copyright owner, such as the right to reproduce the work or communicate it to the public. The creator of a work, who holds moral rights, is not necessarily the owner of copyright in the work. Creators have the right:</p> <ul style="list-style-type: none"> • To be attributed (or credited) for their work • Not to have their work falsely attributed • Not to have their work treated in a derogatory way
National phase	The stage of an international patent application where copies of the application are forwarded to the patent offices of designated countries for examination.
Patent*	A government granted right for the exclusive privilege to make or sell an invention for a limited period (it also prevents anyone else from doing so). When a patent is granted, the applicant becomes its owner and can sell, licence or mortgage the patent. For a patent to be granted, the applicant must disclose how the invention works. Patents are territorial rights only.
Patent attorney	Specialises in providing advice on establishing, maintaining and enforcing intellectual property rights.
Patent Cooperation Treaty (PCT)	This treaty allows for a unified procedure for filing patent applications. In a single filing, countries can be selected in which to pursue patent examination. The examination and grant procedures are then handled by the relevant national or regional authorities. The PCT does not lead to the grant of an "international patent", which does not exist. There are 128 contract states to the PCT.
Patent search	Search of existing patents to assess the competitive position and patentability of an unpatented innovation.
Pre-Seed funding	Investment in an early stage venture or project, which is usually targeted at demonstrating a specific technical proof-of-concept.
Prior Art	An existing technology (previously published or publicly known information) related to an invention. Such technology may limit the scope of a patent application.
Proof-of-Concept	Evidence that an idea or an invention actually works. This may refer to demonstrating that an idea or innovation is feasible when scaled up.
Royalty	A payment for the right to use IP. This is generally a negotiated percentage share of a revenue stream.
Seed funding	Investment in an early stage start-up company. The funding is typically used to develop business, proof of concept, plan and employ key executive staff.
Securitise	Similar to Monetise and used in connection with a royalty income stream from a licence, where the future income from that licence is provided as security (wholly or part) against a financing facility provided by a third party.
Spin-off company	A company formed by a parent company to give it an independent status and as a vehicle to take a technology to the market. The term can be used interchangeably with 'start-up company' to describe the formation of a new company.
Start-up	An early-stage company.
Technology*	An application of science. This term is used interchangeably with innovation to describe

	an invention or research result that has commercial application.
Trade mark	Form of intellectual property protection (for more information, refer to the definition for Intellectual Property).
Trade sale	The sale of a technology or company.
Trade secret	Intellectual property protected by secrecy or a confidentiality agreement. The IP is not published or promoted as is patented IP.
Venture capital	High-risk private equity funding. Typically these companies do not have access to capital but are perceived by the investor(s) as having the promise of high return. As such, the investor usually demands a percentage of the company's equity in return for the investment.
Venture capitalist	Venture capitalists raise money for investment from sources such as institutional investors, superannuation funds and high net worth individuals, usually in the form of partnerships.

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Module 4: Intellectual property and commercialisation

Frequently asked questions

1. How long will it take to commercialise my research?

The commercialisation process can be long. The time between making a disclosure to the university commercialisation office to selling shares in the company marketing your innovation may range from 10 to fifteen years. While some stages of the process can happen very quickly – for instance a provisional patent can be secured within a fortnight – delays and hold-ups should be expected in most stages. (Even when investors seem very keen, the negotiations and contract variations can draw out over six to 12 months.)

Researchers should expect delays in securing funding and anticipate the need for ongoing research and development of their innovation. In particular, expect there to be frustrating difficulties in securing funding to undertake proof-of-concept studies as this is the stage where significant number of Australian university projects with enormous commercial potential languish.

2. Is it possible for me to commercialise my research without the university's commercialisation office?

Commercialisation is a 'people' business, relying on interactions between inventors, commercialisers and industry to extract value from inventions. It is a highly skilled activity which requires professionals with a strong technical and commercial skill base, and several years experience. Researchers are often tempted to believe they can continue their research career as well as manage the commercialisation of their research. In reality, the most successful commercial outcomes are achieved when the commercialisation office and the researcher work together as a cohesive team.

3. How important is the 'market' in determining the commercial outcome of my research?

Markets are comprised of customers with the ability and willingness to purchase products or services to satisfy their needs. The market will make or break a business without sentimentality. Companies with products that don't work will fail; and where the product works but the management does not, the company will either get taken over or raise funds at a lower price. The researcher must never lose sight of the role the market will eventually play in success or failure of their innovation. For this reason, a pragmatic and realistic approach to the commercialisation process is desirable.

4. What issues typically frustrate researchers involved in the commercialisation process?

- The university's profit sharing policy
- Determining the level of involvement of other researchers in developing their innovation (and their share of any profits or joint authorship on patents)
- Ceding control to investors or commercialisation professionals
- Being involved in pitching the innovation to investors
- Being interviewed by the media to promote the research/business

Researchers should canvas these issues with their commercialisation office early in the commercialisation process.

5. If my research is successfully commercialised, am I entitled to some financial benefit?

Check with your university commercialisation office. Most Australian universities have profit sharing policies for their staff and students.

6. Can I undertake commercial collaborative research with another organisation or institution?

Yes, most universities will encourage you to do so. However, you should contact your university commercialisation office before entering into any commercial research arrangement, even if there are no formal agreements. This is important so arrangements can be made for how any future IP is handled, who will own IP, and what commercialisation rights each university will have. It is a good idea to document any collaborative arrangements that are made and confirm them with the other party in writing.

Please seek advice on the issues you should address in your discussions including project management, IP management, the cost to the investments of undertaking the collaboration and ways of managing the process which can optimise the benefit to both parties.

7. Will patenting impact on my ability to publish the results of my research?

No, generally publishing and patenting can 'co-exist'. Once you have filed for patent protection you are generally able to publish without restriction. However, it is advisable to consult with your commercialisation office before publishing anything that may become the subject of a patent application. There may be advantages in delaying publication to minimise the risk of jeopardising the patent. By doing this we achieve the dual objectives of academic publication and securing commercial returns for the university, with neither impacting on the other.

8. If I publish the results of my research or present them at a seminar, will that compromise the ability of the university to patent the invention?

If a patent application has not been filed, then publishing your research results may make it impossible to secure patent protection in the future. Patents are only granted for inventions which are not known to the public, so if you make a public disclosure of all or part of the material which would have gone in to the patent application, this may jeopardise future patenting.

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