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Intellectual Property (IP) for Engineers

Wednesday, 28th of June 2023 | Technical Topic Webinar

Presented By

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Dr. Arti Siddhpura

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- Arti has been in academia since 2003 teaching various Mechanical Engineering units at Australian and overseas universities. Arti is an expert in the development and delivery of various mechanical engineering units at bachelors and master's level in synchronous and asynchronous mode with a strong focus on proven adult learning theories. Arti has been working with EIT since 2017 as a lecturer in mechanical engineering and has been teaching and supervising engineering students at Bachelor, Master and Doctorate level. Arti has developed a keen interest in the field of intellectual properties in engineering and academia since she was involved in development of an intellectual property based units for Doctor of Engineering program which she has been delivering for the last couple of years.
- Arti has accomplished her PhD in Mechanical Engineering through the University of Western Australia where she has won several academic awards to supplement her work and resultant publications. Her research interests lie in the area of condition monitoring and automation with a focus on improving unmanned tool wear prediction methods.

Agenda

Intellectual Property for Engineers

Introduction

Patents

Design Rights

Trade marks

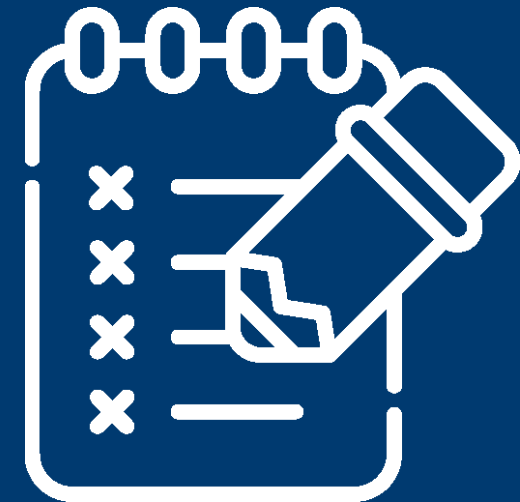
Copyrights

Plant Breeder's Rights

Confidential information/Trade secrets

Ethics Considerations in IP

IP Resources



Introduction

Intellectual Property – Story of Alex:

Once upon a time, in a small town, there lived a brilliant young engineer named Alex...

Introduction

Intellectual Property – Basic Concept:

The person who has put in original effort, must be rewarded.

Grant of legal rights → Encourages innovation and creativity → Society prosper and progress

No reward = No innovations

Introduction

What is Intellectual Property?

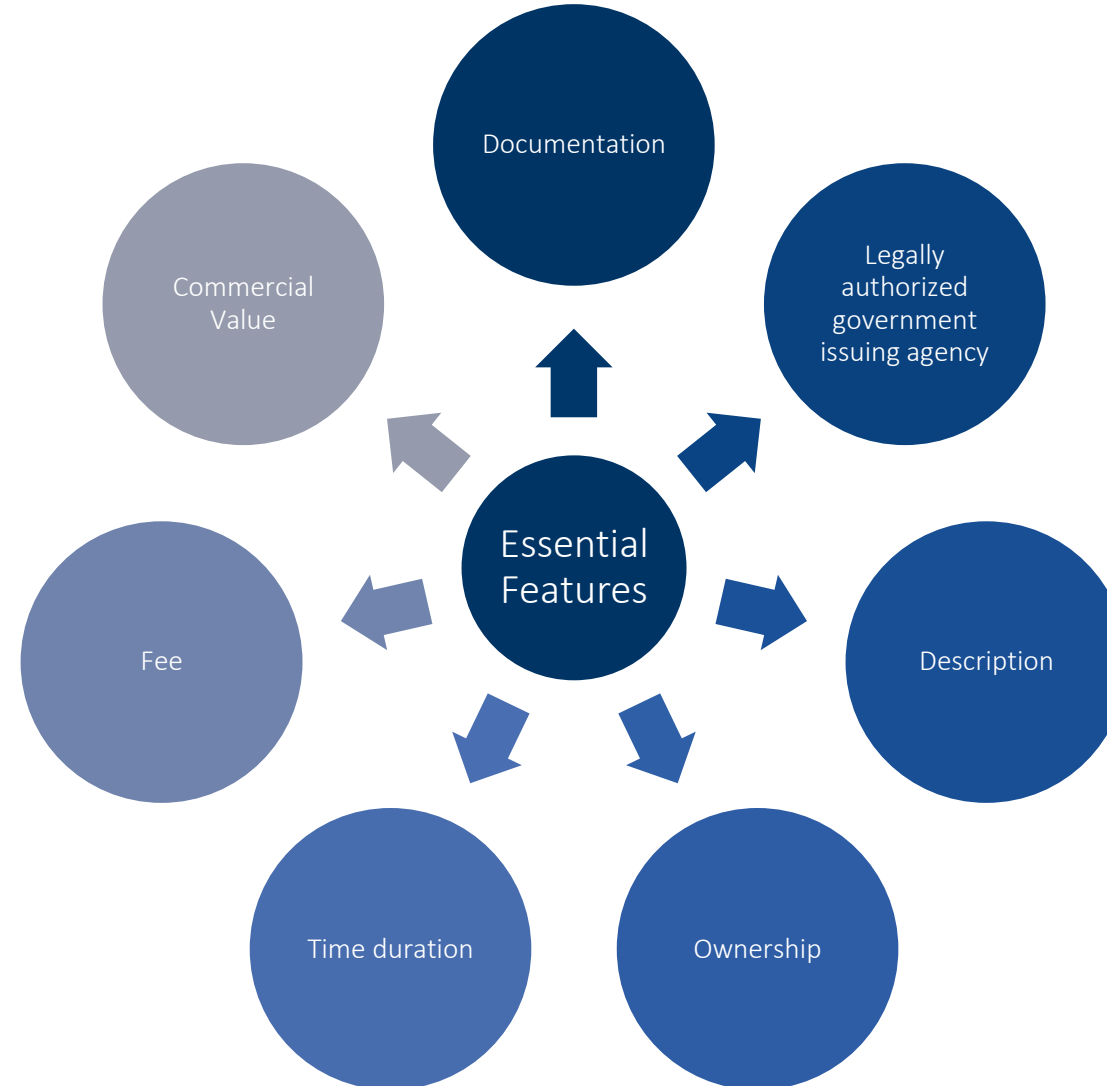
Introduction

What is Intellectual Property?

Intellectual property (IP) refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce.

<https://www.wipo.int/about-ip/en/>

Essential Features of IP:



Introduction

Can you give me an example or two of IP in day-to-day life?

Introduction

Can you give me an example or two of IP in day-to-day life?

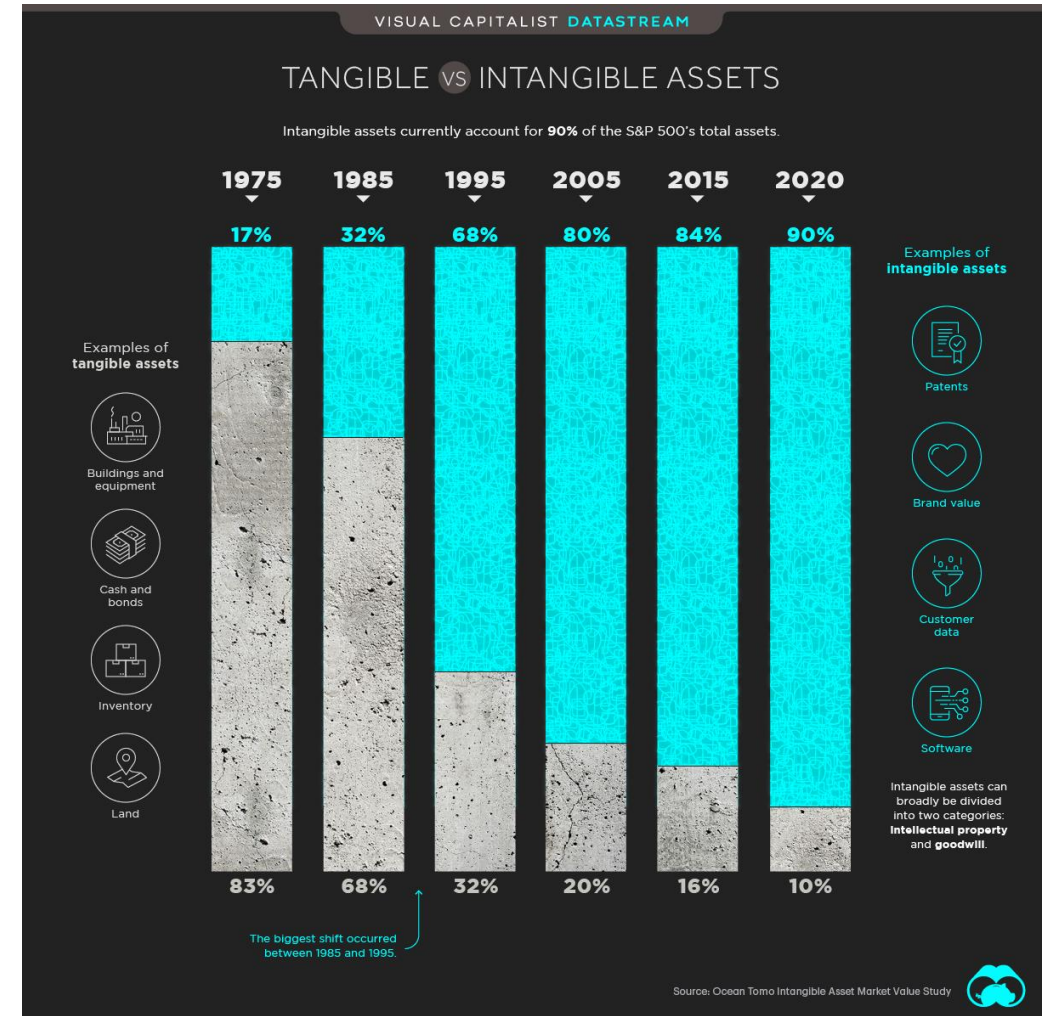
- Clothes
- Shoes
- Car
- Phone
- Book
- Roses

Introduction

Why is Intellectual Property important in emerging technology?

Introduction

Why is Intellectual Property important in emerging technology?



<https://www.visualcapitalist.com/the-soaring-value-of-intangible-assets-in-the-sp-500/>

Introduction

How knowledge of IP can help engineers?

How knowledge
of IP can help
engineers?

Protection of Innovations

- Engineers often develop new inventions, designs, and solutions that can have significant economic and societal impact.
- Knowledge about intellectual property ensures that engineers can protect their creations, preventing unauthorized use or exploitation by others.

Legal Compliance

- Engineers need to be aware of the IP laws that protect the rights of creators and innovators to ensure that their work is in compliance with them.
- Understanding intellectual property rights helps engineers avoid unintentional infringement on the rights of others, which can lead to legal disputes, financial liabilities, and damage to professional reputation.

Encouraging Innovation and Investment

- When engineers know that their ideas and inventions are safeguarded, they are more likely to share and commercialize their innovations.
- This promotes a vibrant culture of creativity, drives technological progress, and attracts investment from companies, investors, and stakeholders who value and protect intellectual property.

Collaboration and Licensing

- Engineers who understand IP can engage in licensing agreements, where they grant permission to others to use their inventions in exchange for royalties or other benefits.
- By effectively managing their IP, engineers can collaborate with industry partners, contribute to open innovation initiatives, and drive the adoption and implementation of their technologies.

Business and Entrepreneurship

- Knowledge about intellectual property becomes essential when developing business strategies, creating value propositions, and establishing market positions.
- It enables engineers to identify competitive advantages, build strong patent portfolios, and negotiate licensing agreements, contributing to the success and sustainability of their ventures.

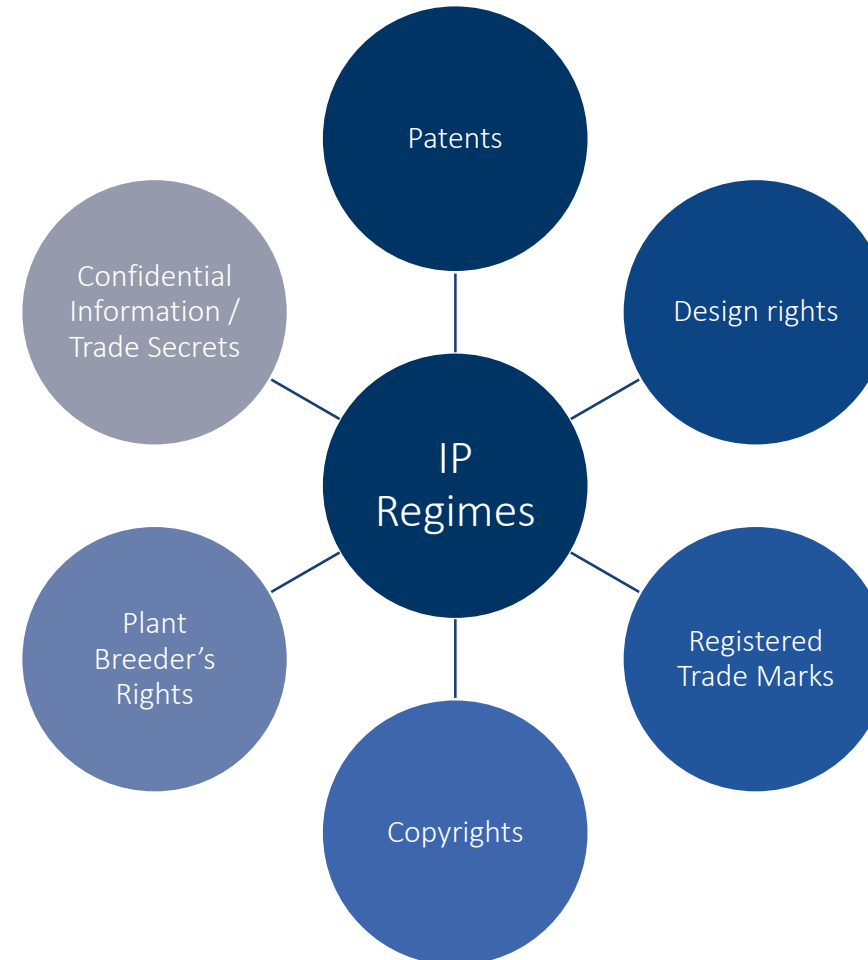
Ethical Considerations

- Intellectual property is fundamentally tied to ethical considerations such as honesty, integrity, and respecting the rights of others.
- Engineers have a professional responsibility to uphold ethical standards and act with integrity in their work.
- This includes recognizing and respecting the intellectual property rights of others, avoiding plagiarism, and ensuring that their own work is original and properly attributed.





Introduction

What are various types of Intellectual Property?

What are various types of Intellectual Property?



A patent protects any device, substance, method or process that's new, inventive and useful.

-  Protects new inventions such as devices, substances, methods and processes
-  Cost \$110 (min) for a provisional patent, up to several thousand dollars for full protection
-  Takes between 6 months (min) and several years to register
-  Lasts up to 20 years (standard) to 25 years (pharmaceutical) provided renewal fees are paid

Examples:



Technology
Google Maps



Device
Cochlear implant



Substance
Polymer (plastic)
bank notes

<https://www.ipaustralia.gov.au/patents/what-are-patents>

What can be patented?

You can use a patent to protect devices, substances, methods or processes. In order to be granted a patent, you'll need to make sure that your invention is:

- New - it must be novel, not disclosed to anyone before the patent application
- Useful - it can be made or used in an industry
- Inventive - it's different enough to what already exists
- A suitable subject matter, known as 'manner of manufacture'.

Advantages:

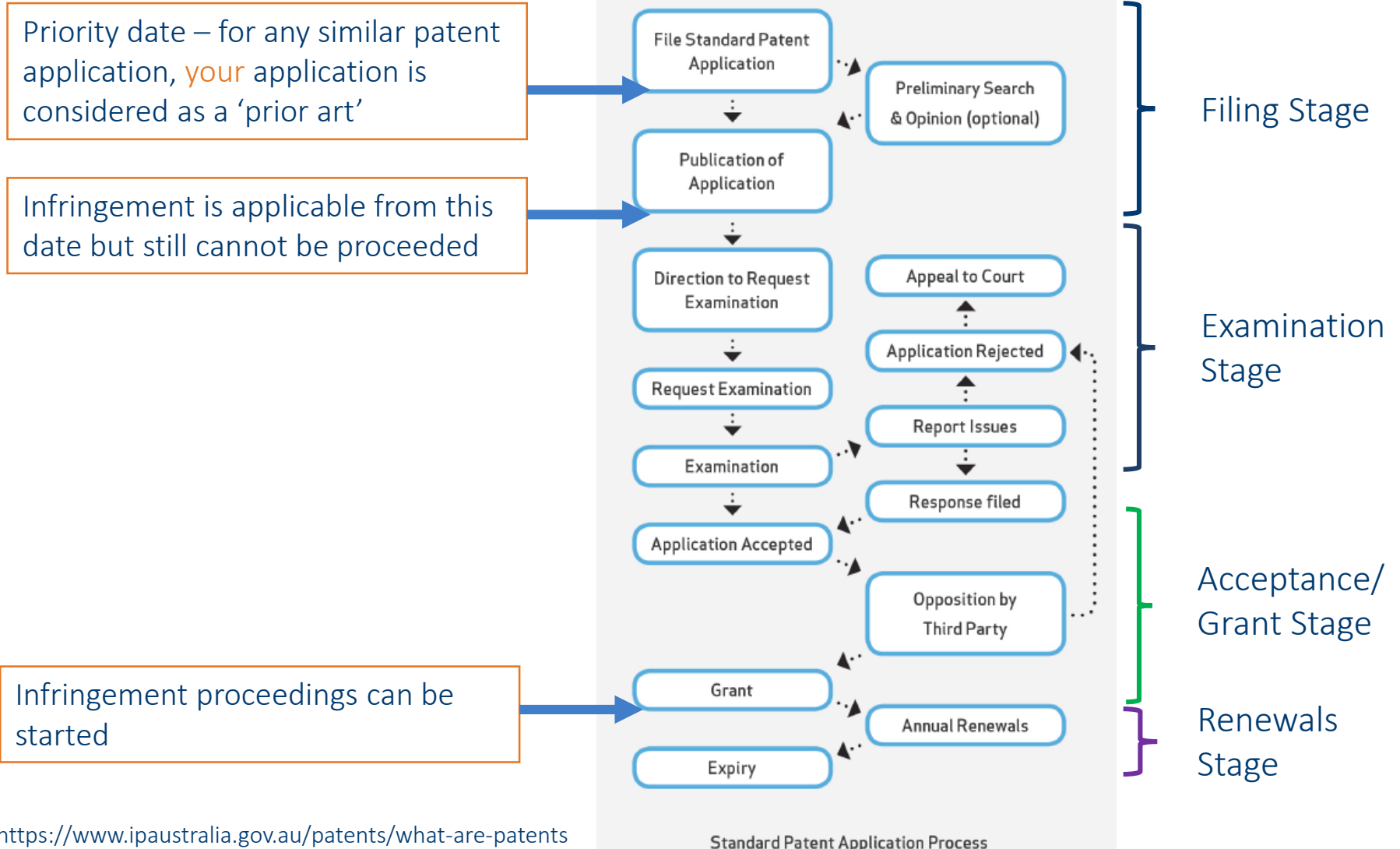
The granting of a patent gives you:

- Exclusive commercial rights to your invention — a monopoly in the market.
- Freedom to license someone else to manufacture your invention on agreed terms, removing the risk that they could steal your idea.
- The right to take legal action that stops others from manufacturing, using and/or selling your invention in Australia without your permission.

<https://www.ipaustralia.gov.au/patents/what-are-patents>

Patents

Patenting process:



<https://www.ipaustralia.gov.au/patents/what-are-patents>

Prior art base and priority date:

- Novelty and inventive or innovative step require a comparison with specified documents and acts throughout the world. This base for comparison is referred to as a 'prior art base'.
- The priority date of a claim is the date of filing the specification in which the invention claimed is first disclosed.
- The patent application with the earlier filing date is prior art to the later filed patent application, and thus blocks the second inventor from obtaining a patent.

<https://www.ipaustralia.gov.au/patents/what-are-patents>

Provisional application:

A provisional application is an optional, inexpensive way of signaling that you may file for a standard patent later on.

- By filing a provisional application first, you will:
 - Have 12 months to decide if it's worth applying for a patent
 - Have additional time to research and work on your invention
 - Establish a priority date
- It doesn't:
 - Provide any level of protection for your invention
 - Result in your invention details being published.

Why search before applying?

You need to be sure that your invention, or a similar product, hasn't:

- Already been patented by someone else, and
- Had any details of what it is and how it works published anywhere.
- You can also use the search to see how similar applicants have written their specifications.

<https://www.ipaustralia.gov.au/patents/what-are-patents>

Patent Documents:

- Ownership and inventor details (including postal address)
- Contact details of an Australian or New Zealand agent
- Prepared specification that describes your invention in detail, formatted in line with the guidelines
- Payment details.

<https://www.ipaustralia.gov.au/patents/what-are-patents>

Patent Specification must include:

- A description of the invention
- Statement of claims
 - The patent application claims set forth in words the content and scope of the property rights the inventor is attempting to secure through the patent grant.
 - Each claim defines a separate and distinct property right. Thus, the claims of a patent define the subject matter of the invention and serve as the metes and bounds of the legal rights conferred by the patent.
 - The claims also serve to provide notice to the public of the precise area of technology that is “fenced in” by the exclusive rights of your patent grant, so that competitors and would-be infringers know where not to tread.
- Summary abstract
- Drawings

<https://www.ipaustralia.gov.au/patents/what-are-patents>

How is patent infringement determined?

- Patent infringement is determined by comparing the imitator's product and/or process to the claims of the patent.
- Each claim is a single sentence that can be thought of as a list of features. Generally speaking, to infringe a patent claim, each and every feature of the claim must be taken.
- As per the court in Doric case: “As a fundamental rule, the test for infringement is determined by the construction of the claim, and there will be no infringement unless the alleged infringer has taken all of the essential features of the claim”

<https://www.ipaustralia.gov.au/patents/what-are-patents>

International Aspects:

Paris Convention (Convention Application):

- The World Organization for Intellectual Property (WIPO) administers this and it applies to the industrial property such as trademarks, patents, utility models, service marks, trade names, and industrial designs.
- 2 main aspects: National treatment and Right of Priority

Patent Cooperation Treaty (PCT Application)

- The Patent Cooperation Treaty makes it possible to seek patent protection for an invention simultaneously in each of a large number of countries by filing an international patent application.
- The granting of patents remains under the control of the national or regional patent Offices in what is called the “national phase”.

Before applying, make sure you:

- Understand what a patent is and what can be patented
- Keep your invention a secret or confirm that you're within the 12 month grace period
- Decide if your idea is worth pursuing now, or if a provisional patent application is better suited to your needs
- Choose if you're filing a standard, international (PCT) or a provisional application
- Understand how much filing a patent will cost, and that there are annual fees.

<https://www.ipaustralia.gov.au/patents/what-are-patents>

Design rights

A design right protects the overall visual appearance of new and distinctive products.

- 🛡️ Protects your product's overall visual appearance
- 💰 Costs \$250 (min)
- 📅 Takes 2 months to register and 4 months to certify (approx)
- 📅 Lasts up to 10 years maximum (renew at 5 years)

Examples:



Dress
Zimmerman dress



Car
Audi car model



Sofa
King Furniture sofa

<https://www.ipaustralia.gov.au/design-rights/what-are-design-rights>

Advantages:

When you register and certify your design, it gives you:

- The exclusive right to use your design within Australia
- The exclusive right to authorize other people to use your design within Australia
- A right that can grow in value and can be sold or licensed within Australia
- The ability to apply for the same design right overseas (within six months of your Australian application)
- The right to take legal action against someone who uses your design without your permission.

<https://www.ipaustralia.gov.au/design-rights/what-are-design-rights>

Design rights

What is protected:

A design right aims to protect the visual appearance of a whole product that:

- Has physical and tangible form
- Is manufactured or handmade
- Is produced on a commercial scale.

<https://www.ipaustralia.gov.au/design-rights/what-are-design-rights>

What is NOT protected:

- Designs with no physical form, e.g. concepts, processes and computer graphics
- The brand name or logo developed for the product
- How the product works
- The materials used in the product
- The size of the product
- Partial design features of the product

Things to consider before applying:

- Make sure it's the right IP for your needs
- Keep your design a secret
- Search for similar designs
- Know how a design right can impact other IP rights
- Decide how many designs you want to protect





<https://www.ipaustralia.gov.au/design-rights/what-are-design-rights>

Design Rights and Copyright:

- Design registration protects the overall appearance of an object, not its function. To be registered as a design, the object must have new and distinctive visual features in its 3D shape and configuration and/or its 2D pattern or ornamentation.
- Once a design is registered under the Designs Act it loses copyright protection. This means it is not an infringement of copyright to do any of the following:
 - make a replica of the design
 - reproduce underlying artistic works (e.g. design drawings or prototypes) as part of the manufacturing process, and
 - reproduce underlying artistic works in promoting and advertising the replica.
- During the period of design registration, making a replica may infringe the owner's rights under the Designs Act. Once Designs Act protection has expired, you may make and advertise a replica of the item without infringing rights under either designs law or copyright law.

Trade marks

A trade mark protects your company's unique brand, products or services.

-  Protects your brand, products or services
-  Costs \$250 (min)
-  Takes 7 months (min) to register
-  Lasts up to 10 years before renewal

Examples:



Logo
Nike swoosh



Colour
Cadbury purple



Shape
Coca-Cola bottle

<https://www.ipaustralia.gov.au/trade-marks/what-are-trade-marks>

Advantages:

Registering your trade mark gives you:

- A business asset → more successful your business becomes, the more valuable your trade mark becomes
- The legal right to place the ® symbol next to your trade mark
- Exclusive rights to use your trade mark in Australia
- The ability to legally deter others from using your trade mark
- The ability to sell your trade mark, or license it for others to use.

<https://www.ipaustralia.gov.au/trade-marks/what-are-trade-marks>

What is protected:

- A trade mark legally protects your brand and helps customers distinguish your products or services in the market.
- Trade marks can be used to protect a logo, phrase, word, letter, color, sound, smell, picture, movement, aspect of packaging or any combination of these.

<https://www.ipaustralia.gov.au/trade-marks/what-are-trade-marks>

Trade marks

Types of trademarks:

Word or Phrase Trade mark	<ul style="list-style-type: none">•Protects numbers, letters, words or phrases.•e.g. L'Oreal's 'Because I'm worth it'.
Fancy Font Trade mark	<ul style="list-style-type: none">•Protects words of phrases in a specific, elaborate font style.•e.g. Ford's cursive font.
Non-English Trade mark	<ul style="list-style-type: none">•Protects non-English words written in Roman characters, or non-Roman characters.•e.g. 'Volkswagen', '真茶' for Gong Cha tea.
Logo or Figurative Trade mark	<ul style="list-style-type: none">•Protects a logo or picture.•e.g. Nike's swoosh logo
Series Trade mark	<ul style="list-style-type: none">•Protects a number of related trade marks.•e.g. TELSTRA STANDARD, TELSTRA DELUXE
Color Trade mark	<ul style="list-style-type: none">•Protects a colour or combination of colours.•e.g. Cadbury's purple shade
Shape Trade mark	<ul style="list-style-type: none">•Protects three-dimensional shapes.•e.g. Coca-Cola's original glass bottle
Sound Trade mark	<ul style="list-style-type: none">•Protects a distinguishing auditory piece.•e.g. The MGM lion
Scent Trade mark	<ul style="list-style-type: none">•Protects a distinct smell associated with a product or service.•e.g. Eucalyptus Radiata scent applied to golf tees.
Movement Trade mark	<ul style="list-style-type: none">•Protects a motion or movement.•e.g. Toyota jump

<https://www.ipaustralia.gov.au/trade-marks/what-are-trade-marks>

Which symbol can I use when I have a trade mark?

- The ™ symbol can be used for both registered and unregistered trade marks of a business.
- The ® symbol can only be used if your trade mark has been approved and registered by IP Australia.



<https://www.ipaustralia.gov.au/trade-marks/what-are-trade-marks>

Copyright protects the original way an idea or information is communicated.

- Protects the original forms or way an idea or information is expressed including writing, visual images, music and moving images
- Free, automatic and exists the moment 'material form' is created
- Lasts for the life of creator plus 70 years

Examples:

- writing
- music
- visual images
- broadcasts
- sound recording
- moving images
- computer programs

<https://business.gov.au/planning/protect-your-brand-idea-or-creation/copyright>

What are the rights of a copyright owner?

- The Copyright Act gives copyright owners a number of exclusive economic rights. These rights vary depending on the type of subject-matter. Generally, a copyright owner has:
 - the right to reproduce the material in a material form
 - the right to publish the material
 - the right to publicly perform the material
 - the right to communicate the material to the public (that is, make the material available online or electronically transmit the material to the public, including by broadcasting)
- Copyright owners may give permission to other people to exercise these rights.
- The Copyright Act also provides authors and performers with certain non-economic rights known as moral rights:
 - the rights to attribution of authorship and performance of one's material
 - the rights against false attribution of authorship and performance
 - the rights of integrity of authorship and performance

<https://www.ag.gov.au/rights-and-protections/copyright/copyright-owners>

How long does copyright protection last?

- Generally copyright lasts for 70 years after the death of the author for works, 70 years after being made public for sound recordings and films, and 50 years after being broadcast for television and radio broadcasts.

<https://www.ag.gov.au/rights-and-protections/copyright/copyright-owners>

When is copyright infringed?

- Copyright is infringed if a person does one of the exclusive acts reserved to the copyright owner without that owner's permission.
- There can be infringement even if only part of a copyright item is used. A use of a 'substantial part' can infringe.

<https://www.ag.gov.au/rights-and-protections/copyright/copyright-owners>

Are there any exceptions to infringement?

The Copyright Act provides exceptions which enable some use of copyright material without the permission of the copyright owner in certain circumstances. The most important exceptions permit 'fair dealings' with copyright material for certain purposes:

- research or study
- criticism or review
- reporting of news
- giving of professional advice by a lawyer or a patent or trade mark attorney
- parody and satire
- making accessible format copies by, or on behalf of, a person with a disability.

<https://www.ag.gov.au/rights-and-protections/copyright/copyright-basics>

A few examples of copyright in engineering fields:

- engineering drawings
- photographs
- flow diagrams
- concept sketches
- Computer programs
- User manual
- Planning application

Plant Breeder's Rights

If you develop a new plant variety, you may want to protect it with plant breeder's rights (PBR).

- 🛡️ Protects new varieties of plants, fungi and algae
- 💰 Costs \$2,300 on average plus external fees
- 📅 Typically 2.5 years to register, dependent on plant type
- 📅 Lasts up to 20 or 25 years, dependent on plant type (requires annual renewal)

Examples:



Barley
Spartacus CL



Apple
ANABP 01



Flower
LegacyFlame

<https://www.ipaustralia.gov.au/plant-breeders-rights/what-are-plant-breeders-rights>

What are they?

- Confidential information is any type of information that you regard as confidential.
- Trade secrets and know-how are subsets of confidential information.
- Confidential information can be business information such as financial records, marketing plans, customer lists etc. Trade secrets and know-how can include all types of technical information.

Confidential information/Trade secret

How to protect them:

- To be afforded protection the information needs to be treated as being confidential, For example, it should be marked as being confidential, kept in a secure place when not actively in use, shared only with those on a need-to-know basis, all copies are accounted for, etc.
- You need to have clear and well-drafted confidentiality obligations in employment agreements as well as agreements engaging consultant and contractors.

How long do they last:

- For as long as they remain outside the public domain.

Summarizing all different IP types:



<https://www.ipaustralia.gov.au/understanding-ip>

Ethics considerations in IP

Code of Ethics – Engineers
Australia:

1. Demonstrate integrity

- 1.1 Act on the basis of a well-informed conscience
- 1.2 Be honest and trustworthy
- 1.3 Respect the dignity of all persons

2. Practice competently

- 2.1 Maintain and develop knowledge and skills
- 2.2 Represent areas of competence objectively
- 2.3 Act on the basis of adequate knowledge.

3. Exercise leadership

- 3.1 Uphold the reputation and trustworthiness of the practice of engineering
- 3.2 Support and encourage diversity
- 3.3 Make reasonable efforts to communicate honestly and effectively to all stakeholders, taking into account the reliance of others on engineering expertise.

4. Promote sustainability

- 4.1 Engage responsibly with the community and other stakeholders
- 4.2 Practise engineering to foster the health, safety and wellbeing of the community and the environment
- 4.3 Balance the needs of the present with the needs of future generations.

Ethics considerations in IP

- Intellectual property is fundamentally tied to ethical considerations such as honesty, integrity, and respecting the rights of others.
- Engineers have a professional responsibility to uphold ethical standards and act with integrity in their work.
- This includes recognizing and respecting the intellectual property rights of others, avoiding plagiarism, and ensuring that their own work is original and properly attributed.

Ethics considerations in IP

Respect for Others' IP:

- Engineers have a moral obligation to respect the intellectual property rights of others.
- This includes refraining from using or appropriating someone else's inventions, designs, or creative works without proper authorization or permission.
- Engaging in plagiarism, unauthorized copying, or infringement not only violates ethical standards but also undermines the foundation of innovation and creativity.

Integrity in Research and Development

- Engineers should accurately represent their work, giving credit to those who have contributed to their projects, and properly citing the sources of inspiration or prior art that have influenced their ideas.
- By upholding integrity in their work, engineers maintain the credibility and trustworthiness of their contributions to the intellectual property landscape.

Proper Disclosure and Patent Filings

- When engineers make significant inventions or developments, they have an ethical responsibility to disclose the details of their work and consider pursuing appropriate patent protection.

Responsible Collaboration

- It is essential for engineers to establish clear agreements and understandings with their collaborators regarding ownership, rights, and the protection of IP. Ethical considerations include respecting the agreed-upon terms, ensuring fair distribution of benefits, and maintaining open communication throughout the collaboration process.

Avoiding Misappropriation and Trade Secrets

- Engineers should refrain from using insider knowledge or proprietary information for personal gain or to the detriment of others.
- Respecting the boundaries of confidential information safeguards the trust placed in engineers and promotes fair competition and ethical business practices.

Education and Awareness

- Engineers have a responsibility to stay informed and educated about intellectual property laws, regulations, and best practices.
- This includes understanding the basics of patents, copyrights, trademarks, and trade secrets, as well as keeping up-to-date with any changes or developments in IP laws.
- By being well-informed, engineers can navigate the IP landscape responsibly, make informed decisions, and protect their own rights while respecting the rights of others.

Ethics considerations in IP

Some Guidelines on Patents:

- Every schematic, each piece of software code, and every drawing, diagram, and prototype has intellectual property rights attached upon creation.
- Although there are multiple aspects to IP protection, all engineers must be very familiar with patent law.
- Instead of assuming what you have done is obvious to others in your field, try to think about the patentability of the creation.
- When building upon someone else's work, be mindful of their intellectual property rights and how not to infringe them.

Ethics considerations in IP

Some Guidelines on Public Disclosure:

- Many a times, as engineers, you are under pressure or put on the spot to present at technical events.
- Be very careful in what you publicly disclose about your new developments before a patent application has been filed.
- Be careful not to be over-enthusiastic or premature in presenting data, even if venture capital is on the line.

Some Guidelines on Copyrights:

- Generally, copyright subsists in tangible things that are the product of someone's skill or labor.
 - You will probably deal mostly with artistic works (e.g. engineering drawings, photographs, flow diagrams, concept sketches, etc.);
 - literary works (e.g. the text of user manuals) and
 - computer programs (e.g. machine, object and source code – in fact, any instructions used to direct the operation of a machine, like the code for CNC machines used in the manufacture of components).
- Copyright subsists automatically and does not need to be registered.
- A copyrighted work can be 2-dimensional (for example, an engineering drawing, photograph, flow diagram or text in a report or manual) or 3-dimensional (an actual component, for example)
- Adapting is also prohibited. Adapting a copyrighted work could mean making a 3-dimensional copy of a 2-dimensional work or translating a similar product manual from one language to the other.

IP Resources:

World Intellectual Property Organization (WIPO)

Find contact details, treaty membership, national intellectual property (IP) laws, IP statistics, technical cooperation, outreach activities, case studies and more:

➤ <https://www.wipo.int/members/en/>

For Australia:

➤ <https://www.ipaustralia.gov.au/>

➤ <https://www.ag.gov.au/rights-and-protections/copyright>

<https://www.business.qld.gov.au/running-business/risk/ip/ip-kit/browse-ip-topics/frequently-asked-questions-faqs/trade-secrets-confidential-information>

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Q&A

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