



UNIVERSITY OF BOTSWANA

Intellectual Property Issues in International Research Collaborations

**DOCLINKS/Commonwealth
African European Residential School
9th-12 July 2012**



ALphonsus Neba, PhD

Office of Research & Development (ORD), University of Botswana



- What are International research collaborations?
- What are the motivations & benefits of research collaborations ?
- Complexity of International Collaborative Research & Development
- Basics of Intellectual Property(IP)
- What Conventions/Laws govern IP?
- What are IP issues that may arise in Int. Research Collaborations?
- What problems are encountered by international collaborations when confronting issues concerning IPRs How can they be addressed?
- A Case Study for Discussion



- A growing social phenomenon(Leydesdorf, 2006)
 - Results in part as a strategy to solve increasingly complex problems & the rising cost of research (Black et al, 2005)
 - In some instances, it responds to government policies tailored to favour globalization(Brahmakulam et al., 2001)
 - Continuous fall of communication costs and increased mobility of scientists and students across international borders



- Number of international articles with authors from at least 2 countries more than doubled in share between 1988 and 2003 from 8% to 20% (National Science Foundation, 2006)
- In 2003, more than 60 countries had co-authored with other countries compared to 32 in 1996 (NSF, 2006)
- Over the period 1995-2005
 - Intercontinental co-authorship increased as a percentage of total published article output as follows:
 - USA: from 17 to 27%;
 - EU: from 18 to 26% ;
 - Asia: from 16 to 18%
- There has been a decline of single individual researcher and single discipline research and a simultaneous emergence of research teams and groups (Carayol and Matt, 2006)



Defining Research Collaborations



- Katz and Martin (1997): *the working together of researchers to achieve the common goal of producing new scientific knowledge*
- In general terms, Collaborations refer to “*All forms of agreements between firms, universities, and research institutes whereby two or more organisations share the commitment to reach a common goal by pooling their resources and coordinating their activities*” (OECD, 1999)
- It may involve several collaborative activities:
 - the expression of opinions,
 - the exchange of ideas, data and other research materials,
 - The exchange of background intellectual property (BIP)
 - working together during the course of a project,
 - working separately on different parts of a project with the purpose of integrating the results at the end,
 - sharing equipment, and exchanging personnel



- The results of collaborative projects and programmes can include a variety of useful outputs, such as prototypes, methods, instruments, data, software, and in particular, IPRs such as patents, copyrights, confidential information, etc



- Achieving a critical mass of research funding by pooling resources
- Taking advantage of the complementary expertise of individual participants and enhancing the effectiveness of projects
- Avoiding duplication or wasteful competition between competitors in particular research areas
- Reducing the cost of research and acting as insurance against the failure of one's own research projects or successes of competitors, through "horizontal" collaborations between competitors in particular markets



UNIVERSITY OF BOTSWANA

Motivations & Benefits...



- Improving access to customers and gaining more accurate empirical data on which to base prototypes, etc through “vertical” collaborations (for example, between users of results, research/academic institutions, and manufacturers and service providers)
- Observing the behaviour and capabilities of competitor companies for information purposes
- Gaining access to academic and other research expertise and creating a pool of specialists trained in specific fields for future recruitment.



- According to Beaver (2001) researchers collaborate
 - to gain access to equipment or other types of resources;
 - to access to new funds;
 - to obtain prestige or visibility;
 - for professional advancement;
 - to make progress more rapidly;
 - to tackle “bigger” problems (more important, more comprehensive, more difficult, global);
 - to enhance research productivity;
 - to claim primacy, ownership and rewards;
 - to get to know more people and to create a network;
 - to learn new skills or techniques;
 - to share the excitement of an area with other people;



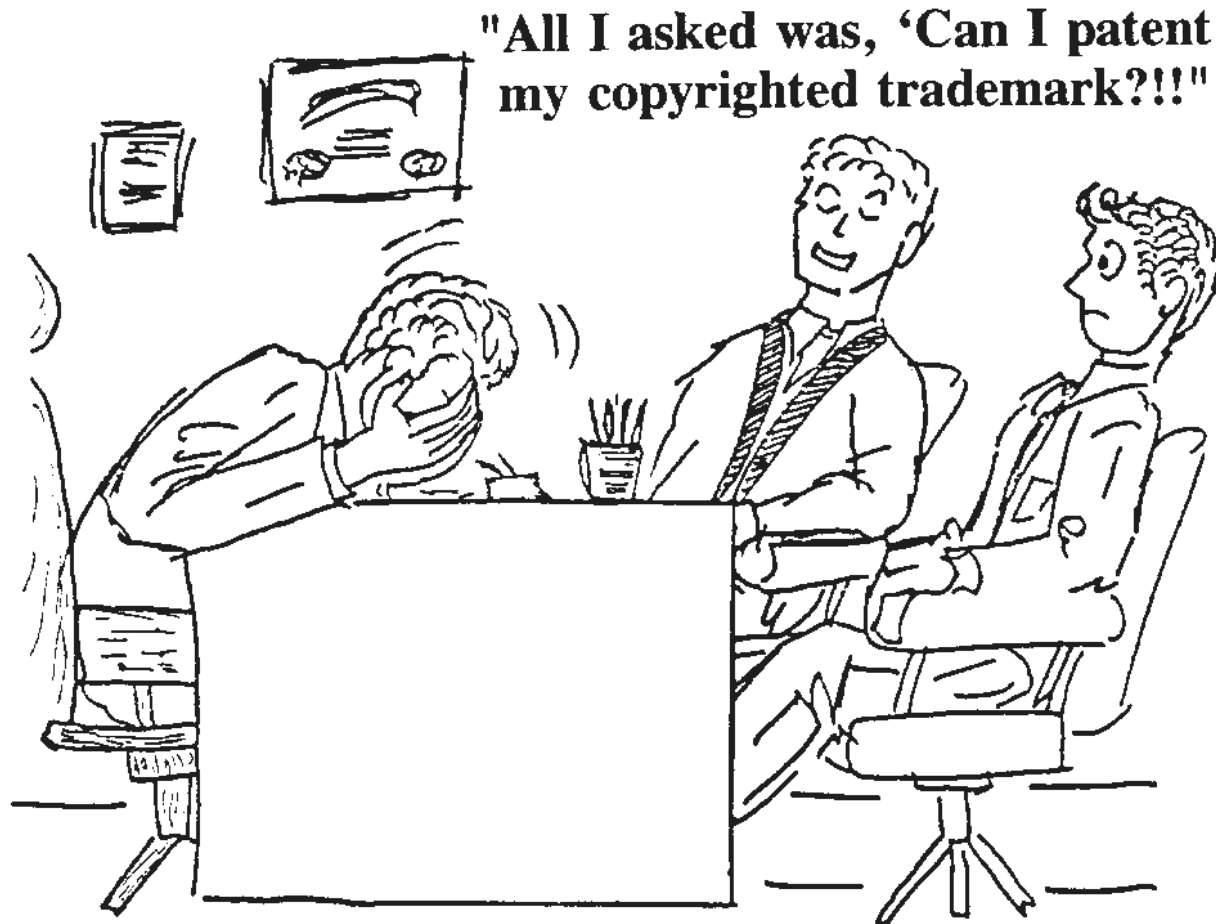
Motivations for Collaborations & Intellectual Property



- All the above motivations are important **when assessing IPRs as they frame the interests and concerns of participants**
- However, **not all motivations imply an expectation of commercially-exploitable research results**
- In some cases, IP considerations when **overlooked at the start of projects** may subsequently be a **source of difficulty and conflict** among partners



Types of Expected Outputs	Types of Participants	Utilization of Results
IPRs e.g. patents, copyrights, designs, confidential information etc.	Commercial enterprises	Incorporation in new commercial products and services
Commercially valuable information communicated by partners	Research Organisations e.g. research associations	Improvement of, or new use for existing products and services
Relationships with other companies and organisations e.g. suppliers or clients	Academic institutions, institutes, departments laboratories,	Use in internal company work e.g. new product development
Private(“de facto”) standards for use in industry or consumer markets	Government research establishments	Input for further research, publications in academic journals; Financial asset-use in negotiation with other firms





- If you don't see a problem with this question, you need this Professional Development workshop!



Common features of intellectual property

intellectual

Subject matter
of protection:

immaterial
(intellectual)
good =
information

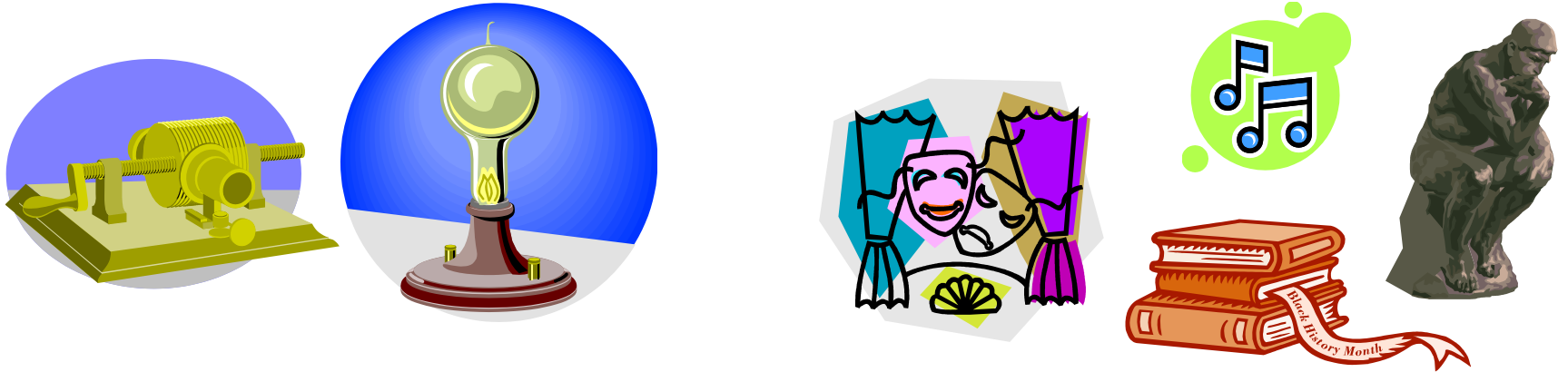
property

Legal nature of
protection:

Exclusive
private right



- Defined as **creations of the human mind** and comprises:
 - Inventions and their protection; e.g. patents
 - Literary & Artistic Works and their protection; e.g. copyright
 - Trade names, trademarks, service marks & geographical indications
 - Trade Secrets and their protection
 - “Know-how”
- **Intellectual Property** reflects the ideas that this subject matter is the product of the mind of the Intellect and that IP rights may be protected by law in the same form as any other property
- IP laws confer a bundle of exclusive rights in relation to the particular form or manner in which ideas or information are expressed or manifested and not in relation to the ideas or concepts themselves





- IP Rights protect the interests of creators of IP by giving them property rights over their creations
- Countries have **laws** to protect IP for two main reasons:
 - (a) Provision of statutory expression of moral and economic rights of creators in their creations, and to rights of public to access them
 - (b) To promote creativity, and the dissemination and application of its results; and to encourage fair trade which would contribute to economic and social development



TWO MAIN CATEGORIES:

- (a) Industrial Property:** inventions (patents), trademarks, industrial designs, service marks, geographical indications, commercial names & designations

- (a) Copyrights & Related Rights:** literary & artistic works (e.g. books, novels, poems & plays, films, musical works); artistic works such as drawings, paintings, photographs & sculptures, architectural designs, technology-based works such as computer programs and electronic databases



- **Related Rights:** Rights related to Copyrights and include:
 - Rights of Performing artists in their performances
 - Rights of Producers of phonograms in their recordings
 - Rights of broadcasters in their radio and tv broadcasts



PATENTS

- Protection for Inventors.
- A Patent Is A Negative Right or Exclusive rights
- **A Patent** is a set of exclusive rights granted by a state to a person for a fixed limited period of time in exchange for the regulated, public disclosure of certain details of a device, method, process, or composition of matter (substance) (known as invention), which is new, inventive and useful or industrially applicable.
- Usually granted for a period of 20years
- A **Patent** is a legal right to exclude others from “making, using, selling, or offering to sell” a patented “invention”
- **A patent is not a grant of an affirmative right to make, use, or sell the invention**
- Three types of patents: **Utility patents (includes “provisional” patents); Design patents and Plant Patents**



Design Patents

- For a **new, original, and ornamental design** for an article of manufacture, in other words, for its **appearance**
- Term: 14 years
- Protects only the **ornamental appearance of the article** and not its structure or function
 - **Appearance is not ornamental if dictated by function**
- Infringement test is whether an accused design is “confusingly similar” to the patented design



Plant Patents

- Protects **new and distinct plant varieties of asexually reproducing plants**
- Term: 14 years from effective filing date
- Uses photographs of plant to identify and protect the invention
- Distinctiveness determined by **characteristics such as habitat, color, flavor, odor**



Utility Patents

The most common type of patent

- Protects **utilitarian structure, function, method, or composition**
- Term: 20 years from effective filing date
- ***Utility Patents:*** are issued for “. . . any ***new*** and ***useful*** **process, machine, manufacture, or composition of matter**, or any new and useful improvement thereof.”

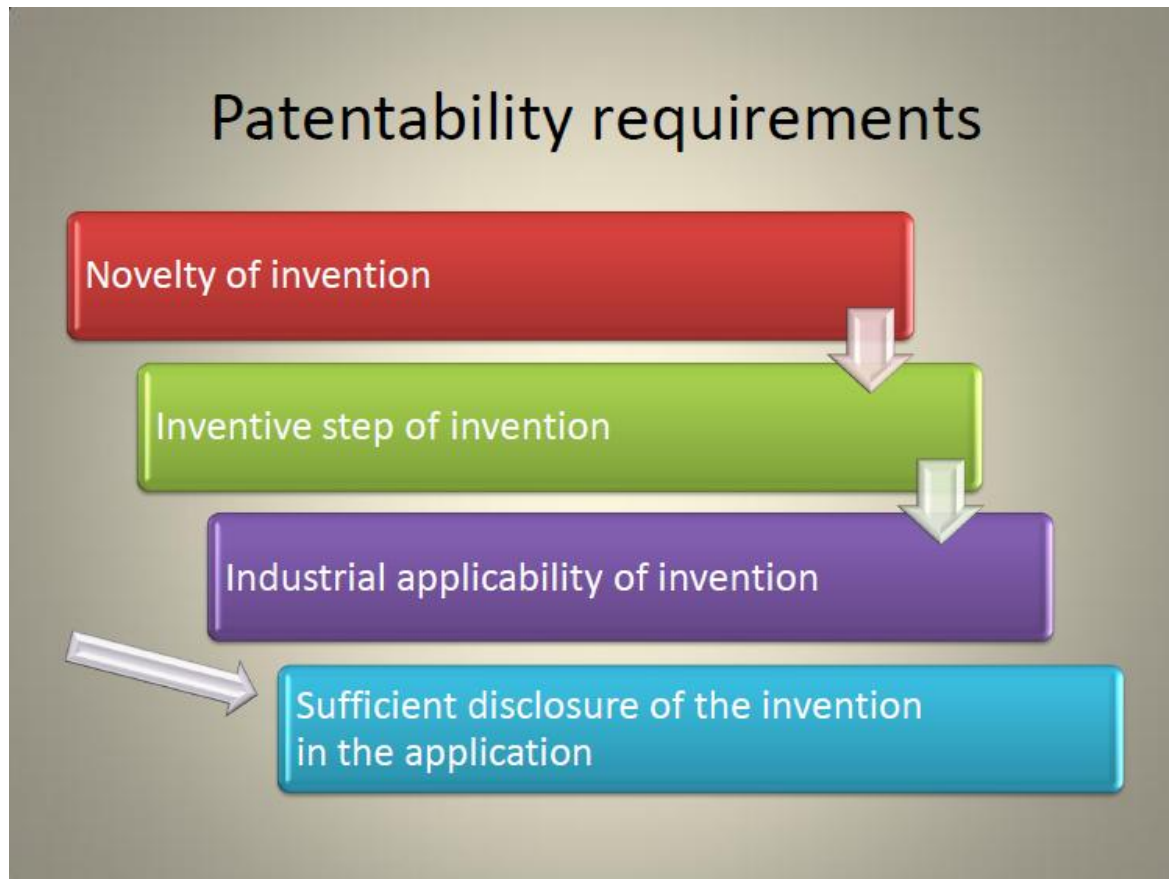


Provisional Patent Applications

- Allows inventor to obtain **early filing date** with few formalities and low filing fee
- Is not examined and cannot mature into a patent
- Automatically abandoned **12 months** (one year) after filing
- A **non-provisional patent application** can rely on the provisional application for **PRIORITY** if filed within one year of the provisional application filing
- Does not affect the 20-year term of a patent issuing from a related non-provisional application



- **Criteria for Patenting**





Criteria for Patenting...

- Three Main Criteria:
 - **New or Novelty:** No “Prior Art”- a novel invention has not been publicly disclosed, has not been made or sold in commerce
 - **Non-Obvious or Inventiveness:** Not obvious to a person “skilled in the art”. No “Prior Art” which would suggest the invention
 - **Usefulness or Applicability:** Must have purpose. The invention must have utility, that is, it must have a practical application. Without utility, there would be no contribution to society, a foundational requirement of the patent system.



What is an Invention and Who is an Inventor?

- Invention requires two elements - conception and reduction to practice
- An invention is *conceived when it is sufficiently formed in the mind of the inventor so that he or she can describe, to those skilled in the art, how to make and use the invention*
- An invention is completed when it is reduced to practice by either making a working model or filing a patent application
- If two or more persons **each shared in the ideas forming the invention**, they are joint inventors and the patent issues to them jointly



Patent Applications

- **Must include:** *Complete and understandable explanation of the invention, a full description of the best mode by the inventor, and the patent must be filed within “the period of grace”.*
- Criteria for the patent application include **drawings showing an embodiment of the invention; a written description of the embodiment referring to the drawings** and **one of more claims**;
- Claims must be **novel** and **non obvious** in nature.



Who is the Owner of an Invention?

- The owner is the inventor unless the inventor is obligated to assign his/her rights in the patent to his employer or client
- Joint inventorship will result in co-ownership unless all the inventors have an obligation to assign his/her ownership rights to the same employer or client
- If the terms of employment are within a joint venture or joint development agreement, more than one institution may co-own the patent with undivided interests
- Advanced planning for collaborative inventions is critical!



What is Patentable?

- May include anything “under the sun” made by man...
 - **Process**: a method of doing something (e.g., manufacturing steel, surgical or medical procedures)
 - **Machine**: combination of mechanical elements
 - **Article of manufacture**: anything which has been manufactured
 - **Composition of matter**: a new chemical, a new formulation of elements, a genetic construct
- Or any new and useful improvement thereof.



What is NOT Patentable?

- *A mere idea* (e.g. law of nature or principle) without application
- *Pure mathematical algorithms* (e.g., $E = MC^2$)
- *An inoperable device* (e.g., perpetual motion machine)
- *An obvious improvement* of an old device
- *Natural plants*
- *Anything not USEFUL, NOVEL and NON-OBVIOUS* (e.g. perpetual motion machine)

Ideas, scientific formulae, and “principles of nature” are not patentable.



- **Publication vs Patent Protection**

- World-wide patent rights will be lost due to public disclosure of an invention before the patent APPLICATION is filed except in Countries in with **Grace Periods**.
- What constitutes public disclosure?
 - ****Publication of a research paper***
 - ****A speech or a talk at a public or open meeting***
 - ****A poster presentation***
 - ****Collaborative research after a discovery***
 - ****Description of invention in published trade journal, magazine, internet website, etc.***
 - * ***Correspondence describing the invention to vendors without an obligation of confidentiality from a Non-Disclosure Agreement***



Disclosing and Protecting

WORST	BETTER	BEST
1. Invent	1. Invent	1. Invent
2. Publish or talk	2. File invention disclosure	2. File invention disclosure
3. File invention disclosure	3. Publish or talk	3. File for patent or otherwise protect
4. File for patent or otherwise protect	4. File for patent or otherwise protect	4. Publish or talk



- **Copyrights**
- **A Copyright is** a set of exclusive rights granted by a government for a limited time ***to protect the particular form, way or manner in which an idea or information is expressed.***
- Copyrights ***may subsist*** in a wide range of creative or artistic forms or “works”, including literary works, movies, musical works, sound recordings, paintings, photographs, software, and industrial designs

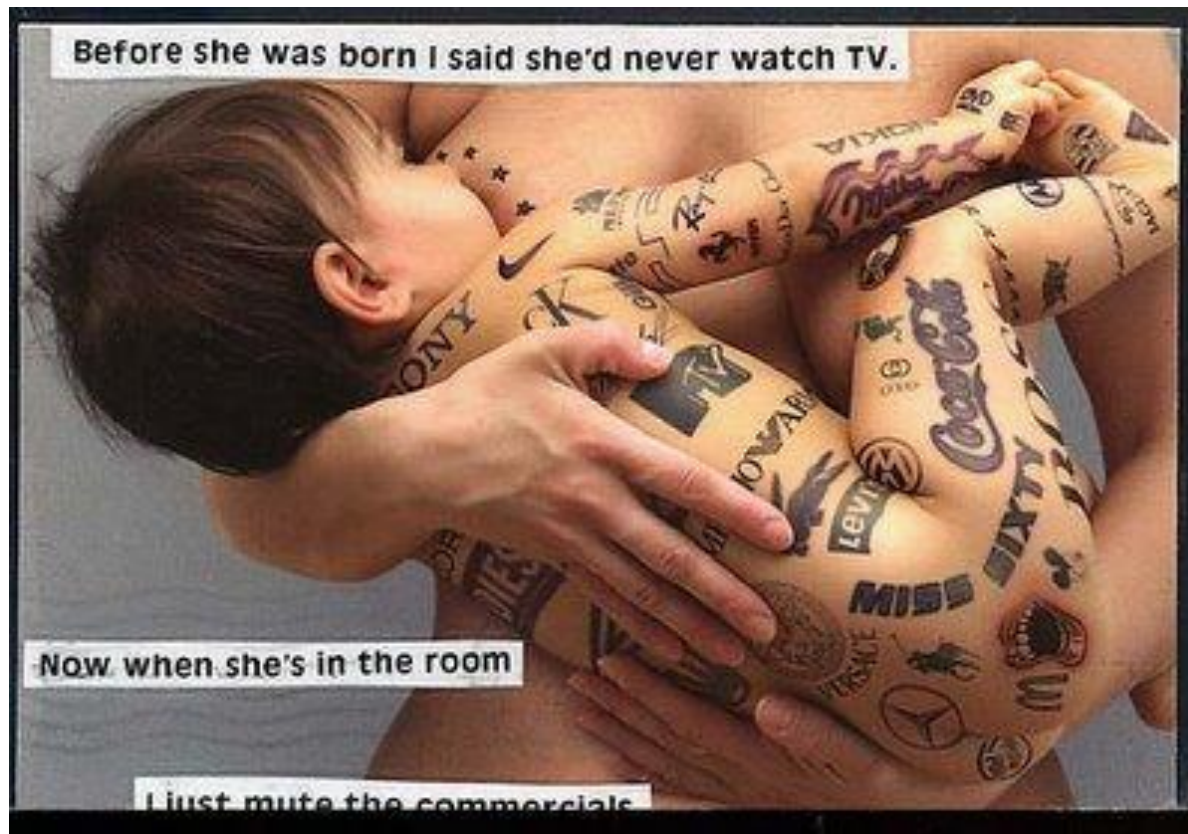


UNIVERSITY OF BOTSWANA

Basics of Intellectual Property...



- Trademarks





UNIVERSITY OF BOTSWANA

Basics of Intellectual Property...



- Trademarks...





Trademarks

- **A Trademark** is a distinctive sign of some form or kind which is used by a business to uniquely identifying itself and its products and services to consumers and to distinguish the business and its products and services from those of other businesses
- **Conventionally**, a trademark comprises a **name, word, phrase, logo, symbol, design, image or combination of these elements.**
- There is also a range of **non-conventional trademarks** comprising marks which do not fall into these standard categories .e.g. **Sounds** and **smells**



Trade Secrets

- A Trade Secret is a ***formula, practice, process, design, instrument, pattern,*** or compilation of information used by a business to obtain advantage over its competitors within the same industry or profession



Why do we want to Protect and License IP?

- It is very ***difficult to license technology*** that is not protected.
- Makes the ***technology available to the public*** and provides ***opportunities for graduates*** and ***recognition to faculty***.
- IP is a ***marketable commodity*** that can be used to leverage additional research dollars and income to support the inventors and the university, and help in the formation of new companies and jobs.



Frameworks Governing Intellectual Property

- **International:** Various Conventions & Agreements e.g. Berne, Rome, Paris Convention, WIPO Treaty, TRIPS-WTO, *Sui Generis* Systems e.g. UPOV, Madrid Treaty
- **Paris Convention:** Protection for Industrial Property Rights.
- **Berne Convention:** Protection for Literary and Artistic works
- **Rome Convention:** Protection of Performers, Producers of Phonograms and Broadcasting Organizations
- **Madrid Treaty:** For protection of Marks
- **Strasbourg Agreement:** International Patent Classification
- **UPOV-** Protection for New Plant varieties
- **Budapest Treaty:** Deposit of microorganisms for purposes of patenting
- Patent Cooperation Treaty (PCT)
- European Convention Treaty etc



- **Regional:** ARIPO, OAPI, EPC,
- **National:** All countries have some form of national laws governing intellectual property & IP rights
- **Institutional:** Most Universities, R&D institutions and funding agencies have Intellectual Property Policies/Guidelines, Research Commercialization Policies/strategies, MTAs etc. These spell out issues of ownership of IP, rights, royalties etc



- Intellectual Property is a **central issue** in International Research Collaborations
- International research collaborations involves:
 - **Cross-border dimensions** of R&D and technology transfer
 - This often involves a **variety of entities and conditions**
 - This can **result** in multi-layered R&D relationships involving **complex legal, commercial or management issues**,
 - Of particular importance are issues related to intellectual property rights.
- The **results** of international collaborative projects and programmes can include a variety of useful outputs, such as prototypes, methods, instruments, data, software, and in particular, IPRs such as patents, copyrights, confidential information, etc.



- Issues related to IPRs in International research Collaborations are generated by the **diversity of international practice regarding IPRs, including patent regimes, rights of privately or publicly employed researchers, social and cultural norms, and different motivations and exploitation strategies**
- **Excellent and fair dispute resolution mechanisms** must be built in contract negotiations and research agreements, especially at initial stages of engagements



- Success in International Research Collaborations depends in part on the establishment of frameworks of rights to intellectual property, in all its types and uses
- **But many international and national types of IPR regimes exist**
- **They are largely not harmonious**
- Each of these **presents its own compromise between the rights to innovators and inventors to derive economic benefits from their inventions** and **the rights of society to benefit from the rapid development and diffusion of new technologies**
- There has been **significant progress in harmonization** through TRIPS- WTO, the PCT and the European Cooperation Treaty amongst European countries
- However, **major national differences in IPR regimes persist and these may cause significant problems** in International Research Collaborations



- **These differences include:**
 - “First to file” vs “First to invent” rules (The World vs the US!)
 - Differences in rules regarding assignment of IPRs i.e. whether these are owned by researchers and inventors or the Universities that employ them, or both the employer and the inventor(s) or the funders
 - Rules regarding disclosure of information especially if parties are from countries with “Grace Periods” or Priority Dates
 - Differences in what is patentable or not from country to country
 - Differences between the rules and practices of challenge to granted patents
 - Differences among government fees for obtaining patents
 - Changes in what is Patentable or not patentable from time to time



- Protection of confidential information
- High costs of patenting at the international level
- Different patent strategies
- Different treatment and publication rules for patents

Other issues worth noting are:

- Legal and regulatory regimes that govern design, location and exploitation of results of international collaborative research
- Competition policies which may differ in their treatment of research and development joint ventures and patent pools
- Tax regulations which may lead to divergent levels of benefits to different parties to the research project or programme
- Contract laws which may vary in their recognition of entities and individuals empowered to commit resources such as previous patents and other intellectual property
- Use of Background and Foreground Intellectual Property



Assignment of IP Rights

- Differences in Potential Claims of employees of the different participating institutions poses a serious problem
 - Who owns an Invention created by employees and who receives the patent rights?
 - Whether or Not employees who invent for their employers should receive extra rewards over and above their salaries?
 - UK Law: Inventions by employees in course of employment belong to employers
 - German Law: Inventions by employees in course of employment belong to employees, but may be claimed by and transferred to employer
 - USA: inventions from government funded research are owned by institutions
 - In other countries, government owns all inventions from government funded research
 - Canada: May be individual researcher owned or institution owned even when research is funded by government. Depends on individual institution policies
- These diverse differences in the practice of assignment of rights pose problems in handling IP issues in international research collaborations



Criteria for Patentability

- Criteria for patentability in different jurisdictions is important where the intention is to patent in multiple-jurisdictions
- Efforts have been to harmonise Criteria for patenting across the world e.g. European Cooperation Treaty, Patent Cooperation Treaty (PCT) and TRIPS Agreement
- Article 27 of the TRIPS Agreement states that: “ *Patents shall be available for any inventions, whether products or processes, in all fields of technology provided that they are new, involve an inventive step and are capable of industrial application*”
- However differences still remain:
 - Software is now generally patented in the US as opposed to protection by copyright in other jurisdictions
 - In some developing countries, pharmaceutical products and plant varieties cannot be patented or protected



Disclosure Rules

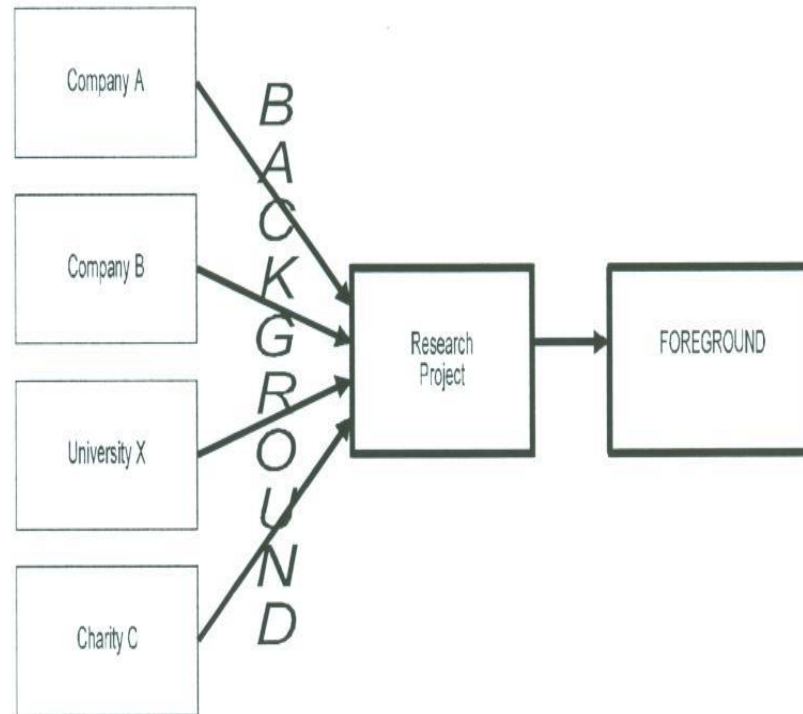
- Divergent national practices with respect to disclosure of invention-related information
- In almost all countries, the rule that a patentable invention must be **novel** applies; so any prior disclosure destroys novelty and by implication, patentability.
- Some jurisdictions e.g. USA have “Grace Periods” of up to 12 months from Disclosure before filing of a patent.
- This stems from the practice of “First to Invent” in the US as opposed to “First to File” in most other jurisdictions
- There can also be problems when publication takes place before a **Priority** date has been secured because this may be cited as prior art



- **Protection of Confidential Information**
 - The issue of protecting confidential information is also important.
 - Provisions must be made to protect the disclosure of information that partners may come across during collaborations and when the collaboration ceases
 - Need to **sign confidentiality agreements** especially by students working on international collaboration research projects
 - If practical to keep information completely secured then, legal regimes are not relevant



- **Use of Background Intellectual Property**



Source: Cameron, 1997.

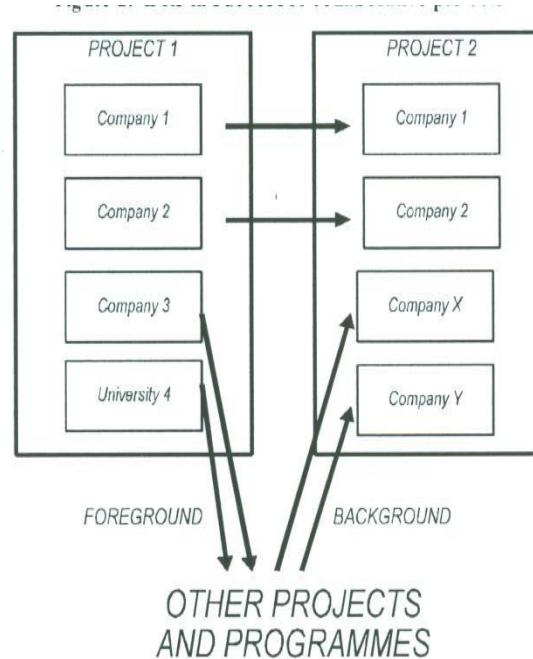


- **Use of Background Intellectual Property**

- BIP defined as ***“information, patents, design, software, proprietary information and all other intellectual property (excluding results of the project itself) which a participant owns or has rights to its use, has contributed or made available to the project and is necessary to the progress of the work or to the exploitation of project results”***
- Contractual conditions relating to BIP may include:
 - Ensuring that all such BIP as may be necessary is disclosed and defined at the beginning of the project or as soon as its importance becomes apparent
 - Ensuring that the project has rights to use the BIP for the purposes of the research project
 - Agreement to maintain confidentiality of other project’s participants proprietary information
 - Participants may also have to agree that BIP is used only for the project at hand and not in other projects



- **Foreground Intellectual Property in Int. Research Collaborations**



Source: Cameron, 1997.



- **Foreground Intellectual Property**
 - Defined as ***“information, patents, designs, software, proprietary information and any other Intellectual property which are generated by any member or sub-contractor of a collaborative project in the executive of the specific project”***.
 - **Foreground IP forms the basis of the exploitation** of results of a project
 - Various regimes possible for dealing with Foreground IP
 - Ownership may be **allocated on the basis of generation of results** or in **proportion of funding by various partners**
 - Ownership may also be **pooled for attributability reasons**
 - All participants may **have the rights to exploit all results** from the research project
 - Other Issues worth Considering:
 - What happens when a partner withdraws from a project?
 - How to address the different needs and purposes for Foreground IP by different partners



- **Cost of Patenting**

- High Costs may discourage prospective participants in international collaborative research projects
- Cost-sharing principles usually apply to the research project itself and seldom extends to subsequent steps involved in securing protection of results
- Partners need to discuss and agree how costs relating to securing patents and future litigation will be handled
- Costs of patenting also differ within different jurisdictions



- **Litigation and Enforcement**

- Consideration must be made of enforcement rules and practices that may determine jurisdictions in case of litigation by third parties
- Cost of litigation differs significantly across jurisdictions
- Rule of law, fairness and independence of courts in different jurisdictions
- Competences of judicial officers e.g. presence of patent judges
- Litigations vs negotiated settlements



- An international collaborative project involves a hardware manufacturer, a software producer and an academic research group and a manufacturing “user”. The hardware and software companies intend to incorporate results in marketed products and sell them to a potential new customer (the user company). The user company will gain from the focus on his specific requirements and further from improved products as well as possibly, a favourable market price. The academic group receives funding, training for research and academic staff and possibly some royalties and license fees.

As academics , what would be your main concerns as far as IPR issues are concerned in the above scenario?



- Collaborative research is growing in importance worldwide. There is a strong need for **increased awareness of the importance of IPRs** in international collaboration.
- It is common to assume that IPR frameworks are important in settling how the results of research collaborations are distributed between the various individual members or categories of members involved in collaborations
- It is the IPRs and the conditions regarding their ownership and utilization that determine the nature, scale and participation in such research. Therefore it is vital to **consult individual institution's IP policies to provide guidance on IP matters related to Int. Res. Collaborations**



- Formal Collaborations agreements with **details on IPR management** are a must:
 - They force the participants at the outset to identify their own interests, rights and responsibilities, and to recognize those of others within the project, and to codify these within a legally binding document which can be consulted during and after the project's lifetime.
 - An important, if not central part of these agreements **deals with the allocation and utilization of IPRs**
 - Must be worked out in consultation of relevant institutional IP Policies & national legislative provisions
 - It is Critical to **involve Tech transfer office personnel and Legal personnel within your institution when negotiating international research collaborations**



- Collaboration agreements should be structured to ensure that third parties have access to results. Collaborations in which the results could be neither owned nor used by the public research institutions should be viewed with caution
- Collaborators should ensure that relevant IPR rules are consistent with the goals of the collaboration. This will include considerations of the costs and extent of patent coverage in different jurisdictions.



References



- European Union. 2002. The Role & Strategic Use of Intellectual Property Rights in International Research Collaborations. Working Paper. Expert Group Report on Role and Strategic use of IPR (Intellectual Property Rights) in International Research Collaborations. Final Report - April 2002.
- National Academy of Sciences. 2011. Examining Core Elements of International Research Collaboration. Summary of a Workshop
- European Union. 2007. Commission Recommendations on the management of intellectual property in knowledge transfer activities and Code of Practice for universities and other public research organisations
- OECD. 1999. Patent Issues in Joint International Research. Working Group on Innovation and Technology Policy. Committee for Science and Technology Policy. Directorate for Science, Technology and Industry. OECD. Paris, France.



UNIVERSITY OF BOTSWANA

Acknowledgements



- JOHN FRASER, Director of the FLORIDA STATE UNIVERSITY TECHNOLOGY TRANSFER OFFICE for granting permission to use material from FSU Tech Transfer Resources in this presentation
- HENRY ESTEREZ of Allen Dyer Doppelt Milbrath & Gilchrist, PA Orlando, Melbourne, Jacksonville
- DENNIS CLARKE of Miles & Stockbridge P.C, USA.