

# A Brochure on Intellectual Property Rights For Universities and R&D Institutions in African Countries

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*The Organization provides services both to its Member States and to the individuals and enterprises that are constituents of those States.*

*The services provided by WIPO to its Member States include the provision of a forum for the development and implementation of intellectual property policies internationally through treaties and other policy instruments.*

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## Foreword

This brochure entitled “Intellectual Property Rights – An Outline for Universities and R&D Organizations in African Countries,” is the first of its kind to be published by the World Intellectual Property Organization (WIPO), bringing to the forefront the importance of intellectual property related issues to research and development in Africa.

Raising awareness of such issues has been one of the driving forces of this Organization and this brochure lends weight in putting that message across. With the increasing globalization of the world economy and the challenges facing us in this new millennium, the importance of IP rights is becoming widely recognized as the crucial factor in safeguarding the results of technological development. We hope that this brochure will allow researchers in African universities to understand the IP system better and establish ways to ensure their efforts may eventually lead to potentially sustainable benefits, both financially and intellectually, for their organizations and countries.

WIPO is grateful to Professor Dr. Tom P.M. Ogada, Associate Professor of Energy and Environmental Engineering, Department of Production Engineering, at Moi University in Eldoret, Kenya, for writing this brochure and highlighting how the private sector and the university system together can make a difference for all the people of the continent.



Kamil Idris  
Director General



## Preface

Issues related to intellectual property rights are becoming increasingly important within universities and research and development (R&D) institutions in Africa. This is particularly so with respect to the current move by most universities to generate income through consultancy, technology transfer and commercialization of innovations, inventions and research findings. Unfortunately, the current level of awareness of researchers in most R&D institutions in Africa as regards intellectual property systems is still rather low. Consequently, these universities and R&D institutions are not yet deriving full benefits from the potential of the intellectual output of their researchers. This publication is aimed at providing this awareness. Attempts have been made to present the content in a cohesive and straightforward way. It is the author's sincere hope that it will stimulate interest in the subject of intellectual property rights amongst researchers in universities and R&D institutions in Africa.



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## I. Relationship Between Research, Technology Development and Intellectual Property

### **A. Stages of Technological Evolution and the Role of Universities and R&D Institutions in African Countries**

1. Based on the concept of Ungku Aziz [1], African countries must undergo the following six stages of technological evolution before they reach the final stage of innovation.
2. Stage I consists in learning operational skills such as driving trucks and performing simple line-process tasks such as assembling. High-level skills, including supervision and management, are provided by foreign workers. Semi-processed materials and parts for assembly are imported. Education is provided at primary and secondary levels. At the tertiary level (if this exists at all), more emphasis is given to the arts and social sciences than to technology, medicine and natural science.
3. Stage II involves learning maintenance and servicing skills progressively, and including the maintenance of heavy plant and equipment, and also electronic equipment. Locals are sent abroad to acquire specific skills. Universities and technical institutes are established to provide courses in engineering, technology and science, taught mainly by foreigners.
4. During stage III, the skills required for repair and replacement of imported technology are learned. At this stage more and more parts for the assembly-cum-manufacturing processes are produced locally. Universities and technical institutes train engineers, technologists and managers, who constitute local manpower for the increasingly sophisticated technological production processes. Research institutes are established and local researchers trained overseas and in local universities.
5. Stage IV entails learning the adaptation of imported designs to local conditions, paying particular attention to the unique conditions of climate, raw materials and labor, and to the practical needs of the local or regional market. At this stage, close links begin to be forged between relevant university departments

and private industry. Universities are beginning to report registration of patents in their annual reports.

6. In stage V, the skills required for the manufacture of whole products and the local construction of plants to meet local needs are developed. Regional markets are expanded in order to obtain a scale of operation sufficient to lower unit costs of production and to provide an adequately large base for technical training and R&D facilities. At this stage, the links between the public and private sectors and university and research institutes are close and mutually supportive. The intellectual property system becomes part and parcel of R&D activities.
7. Stage VI consists in learning to make machines that produce machines, as well as learning to innovate and being ready to approach the frontiers of modern technology in such fields as computers, robotics and biotechnology, using energy and raw materials without causing irreparable damage to the environment, and becoming an exporter of high technology products. The intellectual property system is already integrated into R&D activities.

### **B. Catalysts for the Pace of Transition of Technological Development Between Different Stages.**

8. Each of the stages of technological evolution discussed above has, as a prerequisite, the successful realization of the preceding stage [1]. There is no magic way of jumping straight into the higher stages and bypassing the earlier preparatory stages. The political management of national resources, education, R&D activities and utilization of the intellectual property system can determine the pace at which a nation passes from one stage to the next (Ogada [2]).

### **C. Challenges for Research in Universities and R&D Institutions in African Countries**

9. Universities and R&D institutions in African countries are being urged to play a leading role in spearheading technological development in Africa (Luhanga [3]). However, the need for technological advancement poses several challenges for research activities in universities and R&D institutions in African countries (Kamba [4], Birt [5] and Blume [6]).

10. The first challenge is that for a long time the almost exaggerated emphasis on the pursuit of knowledge for its own sake elevated the university to an 'ivory tower' virtually detached from the community in which it existed. However, owing to the increasing financial pressures and general shortage of resources, it has become quite clear that the pursuit of knowledge for its own sake by universities is a luxury that African countries cannot afford. Universities are expensive institutions to establish and run and normally represent a heavy drain on a country's scarce resources. The State and the community are therefore entitled to expect returns which should be seen to contribute to national development.

11. The second challenge is that universities and R&D institutions should provide the knowledge and information necessary for promoting technological development. They should do so in a way which is suitably responsive to the needs of society and to assist society to make the political, social and economic adjustments required to cope with the ensuing technological developments.

12. The third challenge is to ensure that research enables society to exploit resources, both renewable and non-renewable in a most effective and economic manner. Universities and R&D institutions are therefore required to align part of their research efforts with national needs and requirements, and to justify the value of the entire research effort to the community at large.

13. The fourth challenge is to make the best possible use of information technologies (including patent documents) which offer enormous potential advantages to research workers in the conduct of R&D activities.

14. The fifth is that universities will be strongly challenged by changing public attitudes to the morality and acceptability of certain kinds of research endeavor. It can no longer be assumed that community and government support will be forthcoming for all that can be done in science and technology. Universities will be required to provide, for public scrutiny and debate, well-balanced and comprehensive assessments of the costs and benefits of proposed introductions of new technology.

15. The sixth challenge is that there is frequently a conceptual gap between the outcome of university research and the stage at which the majority of particularly local firms can assimilate it. There is a sort of preparation stage which has to be

completed before the fruits of university research can be realized. R&D starts with the basic idea arising from fundamental research and the extension of such an idea to experimental use through applied research. This is followed by the introduction of new processes by development, the design of new products, their manufacture and finally, the maintenance and servicing of the products sold in the market. Universities in Africa must have organizations in place tailored specifically to this role. Furthermore, the role of universities in developing small and medium-sized industries, which are typical of African countries, is important. Here, an effective university role appears to depend on a holistic approach, bringing together the variety of disciplines found in universities. Moreover, successful university links with emerging industry seem often to derive from the prior involvement of universities in their planning and infrastructure development. A structure within universities designed to provide the linkage is essential.

#### **D. The Way Forward for Universities and R&D Institutions in Africa**

16. In order to address the above-mentioned challenges, universities and R&D institutions in Africa need to learn from the experience of institutions in developed countries as well as developing countries in Asia and Latin America (Ogada [7] and CHE [8]). These institutions have managed to forge closer links with industries and government departments, contribute effectively to countries' development and generate income to support teaching and research activities. They have achieved successes through activities such as:

- commercialization of innovation, inventions and research findings;
- royalties and fees from licensed patents and innovations;
- consultancy, research contracts and sponsored research;
- companies owned by institutions and joint ventures.

17. Experience has also shown that to undertake the above effectively, most of these institutions provide adequate awareness of intellectual property rights and have in place intellectual property policies. They also have support structures such as business incubators, technology transfer centers, patent service offices and industrial parks for technology transfer and commercialization of innovations, inventions and research findings.



## 11. Types of Intellectual Property (IP)

18. There are several types of intellectual property, which a university or R&D institution may wish to pursue [9-17]. These include:

- patents;
- utility models;
- industrial designs;
- trademarks;
- copyrights;
- trade secrets, and;

### A. Patents

a) What is a Patent and What Does it Do?

19. A patent is an exclusive right granted for an invention, which sometimes is a product or a process that provides a new way of doing something, or offers a new technical solution to a known problem. A patent provides protection for the invention to the owner of the patent. The protection is granted for a limited period, generally 20 years from the filing date of the patent application.

b) What Kind of Protection Does a Patent Offer?

20. Patent protection means that the invention cannot be commercially made, used, distributed, imported or sold without the patent owner's consent. These patent rights are usually enforced in a court which, in most systems, holds the authority to stop patent infringement. Conversely, a court can also declare a patent invalid upon a successful challenge by a third party.

c) What Rights Does a Patent Owner Have?

21. A patent owner has the right to decide who may or may not use the patented invention for the period in which the invention is protected. The patent owner may give permission to, or license, other parties to use the invention on mutually agreed terms. The owner may also sell the right to the invention to someone who will then become the new owner of the patent. A patent owner does not necessarily have the right to use the patented invention – there may exist superior (earlier) patents of third parties that in case of use might be infringed.

d) What Happens When the Protection Period Expires?

22. Once a patent expires, the protection ends and an invention enters the public domain, i.e. the owner no longer holds exclusive rights to the invention and the invention becomes available for commercial exploitation by others, free of charge.

e) Why are Patents Useful?

23. Patents provide incentives to individuals by offering them recognition for their creativity and material rewards for their marketable inventions. These incentives encourage innovation, which ensures that the quality of human life is continuously enhanced. Patent owners and licensees may enjoy commercial advantages because of the exclusivity position given by a patent. Patents are ideal vehicles for technology transfer.

f) What Role Do Patents Play in Everyday Life?

24. All patent owners are obliged, in return for patent protection, publicly to disclose information on their invention in order to enrich the total body of technical knowledge in the world. Such an ever-increasing body of public knowledge promotes further creativity and innovation by others. Patents therefore provide not only protection for the owner but valuable information and inspiration for future generations of researchers and inventors.

### B. Utility Models

25. In general terms, utility models protect "small inventions" which may be less inventive and thus may not be protected under a patent. The inclusion of utility models in the intellectual property system in some African countries has the primary objective of encouraging rapidly evolving, native innovations, particularly in small and medium-sized enterprises as well as the informal sector. Most universities and R&D institutions in Africa are currently being urged to take an active part in the development of small and medium-sized enterprises in their respective countries.



### C. Industrial Designs

#### a) What is an Industrial Design?

26. An industrial design is the ornamental or aesthetic aspect of an article. The design may consist of three-dimensional features, such as the shape or surface of an article, or of two-dimensional features, such as patterns, lines or color. Industrial designs are applied to a wide variety of products from industry and handicrafts: from technical and medical instruments to watches, jewelry and other luxury items; from domestic wares and electrical appliances to vehicles and architectural structures; from textile designs to leisure goods. To achieve protection under most national laws, an industrial design must appeal to the eye. This means that an industrial design is primarily of an aesthetic nature and does not protect any technical features of the article to which it is applied.

#### b) Why Protect Industrial Designs?

27. Industrial designs are what make an article attractive and appealing, hence they add to the commercial value of a product and increase its marketability. When an industrial design is protected, the owner - the person or entity that has registered the design - is guaranteed an exclusive right against unauthorized copying or imitation of the design by third parties and in some countries (like in the European Union) even protects in an absolute sense, like a patent against unauthorized use by others. This helps to ensure a fair return on investment. An effective system of protection also benefits consumers and the public at large, by promoting fair competition and honest trade practices, encouraging creativity, and promoting more aesthetically attractive products. Protecting industrial designs helps economic development, by encouraging creativity in the industrial and manufacturing sectors. They contribute to the expansion of commercial activities and the export of national products. Industrial designs can be relatively simple and inexpensive to develop and protect. They are reasonably accessible to small and medium-sized enterprises as well as to individual artists and craftsmen, in both industrialized and developing countries.

### D. Trademarks

#### a) What is a Trademark?

28. A trademark is a distinctive sign which identifies certain goods or services as those produced or provided by a specific person or enterprise. The system helps consumers to identify and purchase a product or service because its nature and quality, indicated by its unique trademark, meet their needs.

#### b) What Does a Trademark Do?

29. A trademark provides protection for the owner of the mark by ensuring the exclusive right to use it in order to identify goods or services, or to authorize another person to use it in return for payment. The period of protection varies but a trademark can be renewed indefinitely, beyond the time limit on payment of additional fees. Trademark protection is enforced by the courts which in most systems have the authority to block trademark infringement. In a broader sense, trademarks promote world-wide initiative and enterprise, by rewarding the owners of trademarks with recognition and financial profit. Trademark protection also hinders the efforts of unfair competitors, such as counterfeiters, to use similar distinctive signs so as to market inferior or different products or services. The system enables people with skill and enterprise to produce and market goods and services in the fairest possible conditions, thereby facilitating international trade.

#### c) What Kinds of Trademarks Can Be Registered?

30. The possibilities are almost limitless. Trademarks may be one or a combination of words, letters and numerals. They may consist of drawings, symbols, three-dimensional signs such as the shape and packaging of goods, audible signs such as music or oral distinguishing features and smells.

31. In universities and R&D institutions, a trademark may be important where the institution owns an enterprise, and sells goods and services. For example, the University of Florida developed an electrolyte replacement for use by its football teams. The formula was patented and had value and the trademark (Gatorado) had similar value. The patent ran out after 17 years but the trademark remained in force and continued to produce income for the University.

## E. Copyrights

### a) What is a Copyright and What Does it Cover?

32. Copyright is a legal term describing rights given to creators for their literary and artistic works. The kinds of works covered by copyright include literary works such as novels, poems, plays, reference works, newspapers, computer programs, databases, films, musical compositions, choreography, artistic works such as paintings, drawings, photographs and sculpture, architecture, and advertisements, maps, and technical drawings.

### b) What Rights Does a Copyright Provide?

33. The creators of original works protected by copyright, and their heirs, have certain basic rights. They hold the exclusive right to use or authorize others to use their works on agreed terms. The creator of a work can prohibit or authorize:

- its reproduction in various forms, such as a printed publication or sound recording;
- its public performance, as in a play or musical work;
- its recordings, for example in the form of compact discs, cassettes, or videotapes;
- its broadcasting, by radio, cable, or satellite;
- its translation into other languages, or its adaptation, such as a novel into a screenplay.

### c) What Benefits May a Creator of Copyright Have?

34. Many creative works protected by copyright require mass distribution, communication, and financial investment for their dissemination (for example, publications, sound recordings, and films). Hence, creators often sell the rights to their works to the individuals or companies best able to market the works in return for payment. These payments are often made dependent on the actual use of the work, and are then referred to as royalties. These economic rights have a limit, according to the relevant World Intellectual Property Organization (WIPO) treaties (such as the Berne Convention), of at least 50 years after the

creator's death. National law may establish longer time limits. This limit enables both creators and their heirs to benefit financially for a reasonable period of time. Copyright protection also includes moral rights, which involve the right to claim authorship of a work and the right to oppose changes to it that could harm the creator's reputation. The creator - or the owner of the copyright in a work - can enforce rights administratively and in the courts, by inspecting premises for evidence of production or possession of illegally made - "pirated" - goods related to protected works. The owner may obtain court orders to stop such activities, as well as seeking damages for the loss of financial rewards and recognition.

### d) How Has Copyright Kept Pace With Advances in Technology?

35. Many owners of creative works do not have the means to pursue the legal and administrative enforcement of copyright, especially given the increasing world-wide use of literary, musical and performance rights. As a result, the establishment of collective management organizations or societies is a growing trend in many countries. These societies can provide members with the benefits of the organization's administrative and legal expertise in, for example, collecting, managing, and disbursing royalties gained from the international use of a member's work. The field of rights related to copyright has expanded enormously with the technological progress of the past few decades, which has brought new ways of spreading creations by such forms of world-wide communication as satellite broadcasts and compact discs. Dissemination of works via the Internet is merely the latest development which raises new questions concerning copyright. WIPO is deeply involved in the ongoing international debate to shape new standards for copyright protection in cyberspace. The Organization administers the WIPO Copyright Treaty and the WIPO Performances and Phonogram Treaty (often known together as the "Internet Treaties"), which set down international norms aimed at preventing unauthorized access to and use of creative works on the Internet or other digital works.

## F. Trade Secrets

### a) What Are Trade Secrets?

36. Trade secrets comprise confidential data, information or compilations used in research, business, commerce or industry. Universities and R&D institutions, government agencies, business entities and individuals may own and use trade

secrets. The information may include confidential scientific and technical data and business, commercial or financial information not publicly known, which is useful in an enterprise and that confers competitive advantages on a person having the right to use such information. The secrecy of the information must be maintained so as to preserve its trade secret status.

37. Trade secrets information may be disclosed or shared under the terms of a confidentiality agreement. Confidential information may be created in sponsored research projects. In this case, the sponsor will generally require the university or R&D institution and the creator to preserve the secrecy of the information. Trade secrets in the form of know-how may be vital to the practice of patented inventions and other innovations. Trade secrets information may have considerable value by itself or in conjunction with other forms of IP.

38. A familiar example of a trade secret is the formula for Coca-Cola. If the formula had been patented, it would no longer be a secret since patent law requires public disclosure of the invention. Anyone who independently and legitimately discovers the secret of the Coca-Cola formula can use that discovery and the Coca-Cola Company would have no legal means to stop them.

39. Some universities, however, may have certain reservations as regards trade secrets protection, arguing that this does not augur well for openness in knowledge sharing which is part of academic missions.

### G. New Plant Varieties

40. Currently, most Universities and R&D institutions in African countries are involved in research in areas such as crop production, livestock and animal health, forestry, fisheries and crop storage. Research efforts in these areas have led to a number of specific achievements e.g. varieties of many crops, which are capable of producing high yield, more adapted to specific farming systems, resistant or tolerant to main diseases and pests, etc. These varieties are made available to farmers through existing seed services. For each variety, descriptive data are also available. They give a brief description of the variety: origin (group, pedigree, common name, etc.), agricultural characteristics (farming system, vegetative cycle, adaptability to biotic and/or abiotic stresses, yield, grain quality,...), etc. These data facilitate the choice of a specific variety for a relevant type of farming system.

41. Under the International Convention for the Protection of New Varieties of Plants ("UPOV Convention"), an intellectual property right, namely "Plant Breeder's Right", can be granted to a breeder [51], if the obtained variety is considered to be new, distinct, uniform, stable and has a suitable denomination. The breeder's right means that the authorization of the breeder is required before accomplishing some acts in respect of the propagating material of the protected variety. The UPOV Convention contains important exceptions to the breeder's right: The use of protected varieties in subsistence farming does not require the breeder's authorization. Protected varieties are available without the breeder's authorization for research and plant breeding and Contracting Parties to the Convention may, within certain limits, permit farmers (other than subsistence farmers) to use for propagating purposes the product of the harvest which they have obtained from the protected variety.

42. By granting a plant breeder's right, the development of new varieties of plants is encouraged in order to contribute to the enhancement of agricultural, horticultural and forestry productivity and, therefore, improvement of income and overall development.

43. In Africa, two countries (Kenya and South Africa) are currently party to the UPOV Convention. Some 20 other countries (Morocco, Tunisia, Zimbabwe and 16 countries parties to the "Bangui Revised Agreement", namely the African Intellectual Property Organization (OAPI) countries) and OAPI itself, already have a legislation in line with the UPOV Convention. Many other African countries have contacted the Office of UPOV for assistance in drafting their plant variety protection legislation.



### III. Registration Process For Intellectual Property Rights (IPRS)

#### **A. General Information on the Protection of Patents**

##### a) What Kinds of Inventions Can Be Patented?

44. It is possible to protect inventions in any technological field, for example, a product or process in the following main areas (Cornish [15] and KIPO [19]):

- human necessities such as agriculture, foodstuffs, tobacco, personal or domestic articles and health;
- processes such as separation, mixing, shaping, printing, transportation and formation;
- engineering fields, including mechanical, electrical, civil and structural, chemical, textile instrumentation and measurement, and mining;
- science, including physics, chemistry and biotechnology.

##### b) What Cannot be Patented?

45. In many countries, the following are not regarded as inventions for patent protection [18]:

- discoveries or findings that are products or processes where mankind has not participated in their creation;
- scientific and mathematical methods and theories;
- schemes, e.g., investments or insurance schemes;
- business methods as such, like credit and stock methods;
- computer programs as such;
- methods for treatment of the human or animal body by surgery or therapy;
- simple presentation of information;
- inventions contrary to public order, morality, public health and safety, and principles of humanity.

##### c) Patentability Requirements

46. There are three major requirements for an application for the issue of a patent [15, 19-21]. These are:

- novelty;
- inventive step, and,
- industrial application or utility.

47. To be granted a patent, an invention must be new (novelty). This means that it must not have been disclosed (that is described sufficiently to enable the invention to be understood, by word of mouth, use, in any piece of printed publication or any other single way domestically or even in most elsewhere in the world), before a first application is made for the patent. In other words, the novelty requirement is denied if a claimed invention has been disclosed before the filing date of the application, or where priority is validly claimed, before the priority date of the application. Novelty therefore indicates some new characteristics which are not known from the body of existing knowledge in the relevant technical field. This body of existing knowledge is called prior art. To establish that an invention is novel, a search must be carried out in existing printed publications. These publications may include previous patent applications. The requirement that an invention must be new makes it essential that before a patent application is made, the invention must be kept secret, though a few countries do not consider a publication of the invention by the inventor himself as novelty destroying if it happened within a grace period of 1 year, for example, before the filing of a patent application. Secondly, to be patentable an invention must be a development or an improvement that is not obvious beforehand. The invention must involve an inventive step which could not be deduced by a person with average knowledge of the technical field. Finally, a valid patent cannot be obtained for something that does not work or that has no useful function. An invention must be of practical use.

#### **B. Filing an Application for National Registration**

##### a) Potential Steps for Patent Registration

48. The steps towards obtaining a patent can be summarized as follows:

- undertaking a preliminary search;
- finding a patent agent;
- helping the patent agent to prepare a patent application;
- filing the application and obtaining a filing date;
- requesting a search and/or examination;



- examiner searches for previous patents and studies the claims;
- examiner either approves or rejects the application;
- applicant responds to examiner's objections and requirements;
- examiner reconsiders and either approves or calls for further amendments;
- if final decision is rejection, applicant may appeal;
- if final decision is approved, then a patent is granted.

#### b) Drafting a Patent Application

49. The first step in securing a patent is the filing of a patent application. The applicant can be a person, company, or organizations, such as a university or R&D institution. The application forms issued by most patent offices are structured in parts or sections which are to be completed with specific information or details about the applicant, title of the invention, and the residence or addresses of the applicant and the inventor. The patent application also requires an indication of the technical field of the invention as well as the background. A description of the invention should be written in clear language and enough detail for an individual with an average understanding of the field to be able to use or reproduce the invention. Drawings, plans and diagrams may accompany a description. The application also contains various claims, i.e., information that determines the extent of protection requested by the applicant. The application should also have an abstract and, where applicable, a declaration of priority (i.e., a statement by the inventor as to whether the substance of his invention is drawn from or based upon another patent application filed earlier at a national patent office or elsewhere). Whereas the process of giving the names and addresses of the applicants and inventors is straightforward, that of providing a clear description of the invention in such a way that another person skilled in the field of the invention would understand involves more. Moreover, the applicant must define accurately his claims in the invention so that protection is ultimately given for definite claims which fulfil patentability conditions or requirements, as set out by a specific law, treaty or convention. It therefore takes skill and practice to acquire the ability to formulate and draft a patent application properly and accurately. Needless to add that basic knowledge of industrial property protection or experience in examining patent applications is very useful in drafting such applications. It is therefore recommended that the services of a trained patent agent are sought. Most national patent offices maintain a list of qualified patent agents.



50. Description: the description discloses an invention in a manner sufficiently clear and complete for the invention to be carried out by a person skilled in the art. The description shall:

- state the title of the invention as it appears in the request;
- specify the technical fields to which the invention relates;
- indicate the background art which, as far as is known to the applicant, can be regarded as useful for the understanding, searching and examination of the invention, and preferably cite the documents reflecting such art;
- disclose the invention as claimed in such terms that the technical problem and its solution can be understood, and state the superior virtues, if any, of the invention with reference to the state of the art;
- briefly describe the figures in the drawings, if any;
- set forth at least the best way envisaged by the applicant for carrying out the invention claimed;
- indicate clearly the way in which the invention is capable of being exploited in industry and the way in which it can be made and used.

51. Claims: the claims define the subject matter for which protection is sought. They should be clear and concise, and should be fully supported by the description. Information specified by the applicant as protected by the claims cannot be used freely (copied, manufactured or sold) by other person until the patent expires. Information not protected by the claims as finally granted can be used immediately by anyone. The challenge is therefore to draft the claims so that the invention is defined broadly enough to provide maximum protection against potential infringers, while at the same time being sufficiently specific to identify the invention and distinguish it from all previous inventions.

52. Drawing (s): Flow sheets and diagrams usually are considered to be drawings. The abstract is a summary of the disclosure (approximately 150 words), as contained in the description, the claims and any drawings. It indicates the technical field to which the invention pertains. It should be drafted in such a way as to allow clear understanding of the technical problem, its solution and the main use of the invention. A well-drafted abstract enables immediate understanding of the invention for the purposes of undertaking patent research. A priority document is a document which forms the basis of or refers to the application being made. Basically, a priority document would be a copy of a patent, original patent application, sometimes certified. The document is attached to the application.





### c) Assisting a Patent Agent to Obtain Maximum Protection

53. An inventor should strive to assist a patent agent in obtaining the strongest possible patent and avoid unnecessary costs by providing him or her with the right information. The inventor should carefully prepare a statement covering the following points:

- subject matter of the invention;
- a broad description of the invention;
- objectives of the invention, including its main practical advantages over existing practices and products;
- the preferred practice, i.e. the most appropriate use of the invention;
- features of the invention that are new and distinguish it from what has come before. These features should be stated, regardless of whether they may be patented or not;
- the scope of the invention, i.e., the materials, compositions and conditions used to obtain the best results;
- limitations;
- results of laboratory or commercial tests illustrating both the preferred practice and the conditions under which unfavorable or hazardous results could be expected;
- lists of relevant patents or technical articles available from a literature search.

54. Filing/Priority date: when an application document is submitted to a patent office, it is subjected to a preliminary examination in order to establish that the application contains no defects. In other words, it is properly completed and provides the name and address of the applicant, title of the invention, description, claims and abstract. Also, in many countries, all relevant documents must be submitted and requisite fees paid. An application that is found to be in order is stamped with the filing date. The filing date is extremely important for the purposes of an ownership claim. This is because in some countries, if two or more people separately and simultaneously come up with an invention, the first person to file it is the owner of the invention. The priority so obtained can be used for foreign filings, see below.

55. Requesting an examination: once filed, the application is not automatically examined. The applicant must formally request a preliminary examination and search, and pay the search author examination fees. In some cases, the applicant

may wish to delay a request by an examination in order to assess the feasibility or marketability of the invention. Filing will already provide a degree of protection. There is, however, a time limit for this. For example, in Kenya, a request for an examination must be made within 3 years of the filing date.

56. Undertaking an examination and search: the patent examiner assesses the application to determine whether it is in the proper format. The next step is a study of the claims and a search among previous patents and other technical literature to find what is most closely related to the features covered in the claims. The examiner will reject what is old, obvious or improper in the claims by means of a report to the applicant or patent agent. The examiner's search often results in the rejection of some claims. This is the consequence of patent agents tending to draft broad claims in an attempt to obtain the fullest possible protection. The examiner may discover previous patents or publications, which show every feature of one or more claims in the application, thereby destroying novelty, or may consider some claims to be obvious to a person having ordinary skill in the field.

57. Responding to examiners' comments: The examiner may reject the whole application or only certain claims or may demand other changes to the application. Together with the agent, the applicant will carefully study the examiners' comments to help him or her decide whether to abandon the application or proceed with it. If he or she decides to continue, he or she will be required to prepare a reply, known as an amendment letter. This may include changing, canceling or adding some claims. On receiving the applicant's response, the examiner will study it and prepare further instructions, which may be to inform him or her that he or she will be granted a patent, or call for further amendments.

58. Appealing: in all countries, appeal mechanisms are in place, should the examiner totally reject an application.

### C. Filing an Application for Regional Protection

#### a) How to Get Protection Outside the Country of Origin

59. An applicant may apply for a patent in different regions by means of the following possibilities [19]:

- African Regional Industrial Property Organization (ARIPO);
- African Intellectual Property Organization (OAPI), intended for French speaking countries in Africa. It is situated in Yaoundé, Cameroon and covers 14 countries;
- European Patent Office (EPO) in Munich, Germany covering 17 countries under the European Patent Organization;
- it is also possible to apply through a national patent office to any country not covered by the above organizations.

60. The African Regional Industrial Property Organization (ARIPO) is based in Harare, Zimbabwe. It is mainly for English-speaking African Countries. One of the main objectives of the Harare Protocol is to enable member countries to file a patent application in Harare, and designate the other member states in which protection is also sought. Once ARIPO grants the application, it will have a degree of protection in all the States thus designated. The application conditions, and details required in the application form and their drafting, are basically the same as these for national patent offices. There are currently (2001) 11 Member States. These are Botswana, Gambia, Ghana, Kenya, Lesotho, Malawi, Sudan, Swaziland, Uganda, Zambia and Zimbabwe.

#### **D. Filing an Application for International Registration – Patent Cooperation Treaty (PCT)**

##### a) What is the PCT?

61. As the name suggests, the PCT is an agreement for international cooperation in the field of patents [21-23]. It is largely a treaty for rationalization and cooperation with regard to the filing, searching and examination of patent publications, and the dissemination of the technical information contained therein. The PCT does not provide for the granting of “international patents.” The responsibility for granting patents remains exclusively in the hands of the patent offices of the countries where protection is sought (the designated countries).

##### b) The Advantages of the PCT Over the Traditional Patent System

62. The traditional patent system requires the filing of individual patent applications for each country for which patent protection is sought. This is with

the exception of the regional patent systems such as the African Intellectual Property Organization (OAPI) system, the African Regional Industrial Property Organization (ARIPO), the Eurasian Patent System and the European Patent System. Under this route, priority and earlier application can be claimed for applications filed subsequently in foreign countries within 12 months of the filing date of the earlier application. This means expenses for translation, patent attorneys in the various countries and payment of fees to the patent offices, all at a time at which the applicant often does not know whether he is likely to obtain a patent.

63. Filing patent applications under the traditional system means that every single patent office has to carry out a formal examination of every application filed with it. Such offices must also make a search to determine the state of the art in the technical field of the invention and have to carry out an examination as to its patentability.

##### c) Resolving the Shortcomings of the Traditional Patent System by Means of the PCT

64. In order to overcome some of the problems involved in the traditional system, an international treaty was drafted, discussed and finally adopted, and became the Patent Cooperation Treaty (PCT). The PCT entered into force on January 24, 1978, and became operational on June 1, 1978, with an initial 18 Contracting States. Currently there are 117 Contracting States, of which 32 are from Africa.

65. The principal objective of the PCT is to simplify and render more effective and economical the process of acquiring patent protection abroad. To achieve its objective, the PCT established an international system which allows filing with a single patent office (receiving office) of a single application (the international application) in one language and having effect in each of the States parties to the PCT, which the applicant designates in his application. For each international application, an international search is carried out. This results in a report citing the relevant prior art which may have to be taken into account in deciding whether the invention is patentable. The report is made available first to the applicant, subsequently published and thereafter sent to all patent offices in the designated countries, which then decide individually whether to grant a patent.

66. The filing, search, possibly examination and publication of an international application is called the "international phase" of the PCT procedure, whereas the "national phase" describes the last part of the patent-granting procedure, which is the task of the national offices of the designated countries.

67. Even in the most developed countries, patent offices have been struggling for years with a heavy workload (leading to delays) and with questions of how best to allocate resources so as to ensure that the patent system yields the greatest return from the available manpower. Under the PCT system, by the time an international application reaches a national office, it has already been examined as to its form by the receiving office and searched by the International Searching Authority. This enables the workloads of the national patent offices to be reduced, since they have the benefit of these international-phase centralized procedures and do not therefore need to duplicate those efforts.

68. The filing of international applications under the PCT began on June 1, 1978. By the end of 1997, a total of 348,335 international applications had been received by the International Bureau of WIPO.

## E. Protection of Industrial Designs

### a) What Can be Registered as an Industrial Design?

69. The following are examples of industrial designs (Muna [24]):

- the appearance of a ciondo (a popular Kenyan home made handbag);
- the pattern appearance of a pen;
- the outside appearance of a vehicle;
- the pattern on a textile item;
- furniture designs, e.g. a sofa set, dining table, and so on.

70. In most countries, an industrial design must be registered to enable it to be protected under industrial design law. As a general rule, for registration purposes the design must be "new" or "original". Different countries have varying definitions of such terms, as well as variations in the registration process itself. Generally, "new" means that no identical or very similar design is known to have existed before. Once a design is registered, a registration certificate is issued.

### b) What Cannot be Registered as an Industrial Design?

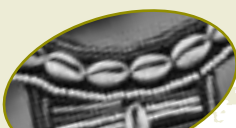
71. In some countries, the following are not included in the category of industrial designs [11,15, 24] that can be registered:

- works of sculpture, architecture, painting, engraving, enameling, embroidery, photography, and any other inventions of a purely artistic nature;
- inventions contrary to public order, morality, public health and safety;
- designs whose features correspond to, or are determined by the function to be performed by the products;
- designs that consist solely of a change in the color of a design already known.

### c) Process of Registering an Industrial Design

72. Any person wishing to apply for industrial design protection must first produce an industrial design which to them appears new and original [24]. The process is more or less similar to that of registering a patent, although much simpler. The applicant is required to complete an application form for an industrial design. It must be borne in mind that protection begins at the date of filing and, if two similar applications are filed, the first to be filed will be registered while the second one will be disqualified on the grounds of lack of novelty. Inventors should therefore file their designs at the earliest possible juncture. The applicant is also required to provide four identical copies of the representation of the design, if the design applies to a single article, or five identical copies if the design applies to a set of articles. A set of articles means a unit composed of different pieces which work together, e.g., a sofa set which comprises three different items but which work together. A representation can be a photograph, a drawing or tracing, or where the design applies to textile articles, the actual specimen can be supplied.

73. Once an inventor-applicant has filed a design application, the national patent office checks whether all the required documents and items are present and in order. If it is found that some items are not in order, the applicant is informed and requested to furnish the office with the requisite information. Once the office is satisfied that the application is in order, it then proceeds to check for novelty of the industrial design. This involves comparing the existing designs with the applicant's design. If it is found that the applicant's design is new and



original, then the design is registered. Once an industrial design is registered, the duration of protection conferred by a certificate of registration for an industrial design is five years from the date of filing. The registration may be renewed for two further consecutive periods of five years each upon payment of a renewable fee. In total, an industrial design can be protected for a maximum of fifteen years.

d) Can International Protection be Granted?

74. Generally, industrial design protection is limited to the country in which protection is granted [12]. Under the Hague Agreement Concerning the International Deposit of Industrial Designs, a WIPO-administered treaty, an international registration procedure is provided. An applicant can file a single international deposit either with WIPO or under the treaty. The design will then be protected in as many member countries of the treaty as the applicant wishes. National "Second Filings" as well as The –Hague-Filings may be made with a priority claim of 6 months.

## F. Registration of Trademarks

a) How is a Trademark Registered?

75. Firstly, an application for registration of a trademark must be filed with the appropriate national or regional trademark office [13]. The application must contain a clear reproduction of the trademark filed for registration, including any colors, forms, or three-dimensional features. The application must also contain a list of goods or services to which the sign would apply. The sign must fulfil certain conditions in order to be protected as a trademark or other type of mark. It must be distinctive so that the consumer can distinguish it as identifying a particular product, as well as differing from other trademarks identifying other products. It must neither mislead nor deceive customers, or violate public order or morality. Finally, the rights applied for cannot be the same as, or similar to, rights already granted to another trademark owner. This may be determined through search and examination by the national office, or by the opposition of third parties who claim similar or identical rights.

b) How Extensive is Trademark Protection?

76. Almost all countries in the world register and protect trademarks. Each national or regional office maintains a Register of Trademarks, which contains full application information on all registrations and renewals, facilitating examination, search, and potential opposition by third parties [13]. The effects of such registration are, however, limited to the country (or, in the case of a regional registration, countries) concerned.

77. The following steps are involved in the registration of trademarks (Ramba [25]):

- preliminary search either by the applicant or registrar;
- application for registration;
- examination of a trademark by a trademark office;
- advertising or publication of the trademark;
- allowing time for opposition;
- registration and issue of a registration certificate.

c) Protecting a Trademark Abroad Using the Madrid Protocol

78. In the same way as the PCT for the registration of patents, the Madrid Protocol eliminates, for the purposes of trademark protection in several countries, the need to file a separate application in each country, which is complicated and expensive [25]. The Treaty provides for the international registration of trademarks and service marks. By filing a single international application in one language (English or French) it is possible to obtain a single registration (international registration) which secures protection for a mark in several countries which are parties to the Protocol. An international application under the Madrid Protocol may be filed by any person who has a real and effective industrial or commercial establishment, or a domicile in or is a national of one of the States parties to the Protocol.

d) How is an International Application for a Trademark Processed?

79. Before a mark can be the subject of an international application, it must already have been registered, or registration must have been applied for, for the same goods or services with the trademark registration office of the country of origin. The date of filing is important, since priority can be claimed for a first



national or regional application in an international application, within six months of the filing of the first application.

80. An international application must be filed with the office of origin.

The office certifies that:

- the mark in the international application is the same as the goods and services in the national application or registration;
- the applicant is the same person as the owner of the national application or registration, and;
- the goods and services listed in the international application are covered by those listed in the basic application or registration.

81. The office of origin then forwards the international application to the International Bureau of WIPO. Fees are required for the international application. They are to be paid direct to the International Bureau although, in some cases, the office of origin may be prepared to collect and forward them. In addition, the office of origin may charge a handling fee for forwarding the international application to the International Bureau.

82. The International Bureau checks that all the filing requirements are met and that the goods and services are correctly classified. If so, the mark is recorded in the International Register. The International Bureau then gives notification of the international registration to the offices of the designated countries. The International Bureau does not examine whether the mark as such qualifies for protection, or whether an identical or similar mark has already been registered, since this is a matter for the offices of the designated countries. If no refusal is notified within the prescribed time limit, the protection of the mark in each designated country is the same as if the office of that country had registered the mark.

83. An international registration bears the date on which the international application was filed with the office of origin, provided that it reaches the International Bureau within two months and that no essential elements (such as a reproduction of the mark, or the list of goods and services) are missing. A priority claim (6 months) can be made.

84. The office of a designated country has the right to refuse protection for a mark in the territory of that country. A refusal may be made on any of the

grounds on which an application for registration filed direct with that office might be refused. Notification of refusal is given to the International Bureau and recorded in the International Register. In principle, any refusal must be issued not later than 12 months from the date on which the office concerned was notified of the designation. At the end of the applicable time limit, the holder of an international registration is therefore in a position to know whether his mark has been accepted for protection in each of the designated countries, whether protection has been refused in one country, or whether there is still a possibility of refusal on the basis of an opposition in a particular country. The holder has the same right to contest the refusal with the office that issued it as if the mark had been deposited directly with that office. Where the refusal relates only to some of the goods and services listed in the international registration, and the refusal is not contested, the mark stands protected for the remaining goods or services, without any action being needed on the part of the holder.

85. International registration lasts for ten years. Paying the requisite fees to the International Bureau may renew it for a further ten-year period. Additional countries can be designated at any time, provided they are parties to the Protocol at the time of the designation. Such subsequent designations are useful where new countries accede to the Protocol, or simply where the holder's interest in a country develops after an international registration has been made.

86. The following changes affecting an international registration can be recorded in the International Register:

- a change in the name or address of the holder or ownership of the registration;
- a limitation on the list of goods and services;
- a renunciation of the protection in respect of one or more of the designated countries;
- cancellation of the international registration.

### G. Registration of Copyright

87. Copyright itself does not depend on official procedures. A created work is considered protected by copyright as soon as it is produced. However, many countries have national copyright offices and some laws allow for the registration of works for the purposes of, for example, identifying and distinguishing titles of works.



## IV. Benefits of the IP System for Universities and R&D Institutions

### A. Importance of Patent Information Services for R&D and Other Commercial Activities

#### a) Possible Use of Patent Documents

88. There are a large number of benefits which researchers from universities and R&D institutions as well as investors can derive from patent documents (Kiige [26], Sackey [27] and Misati [28]).

89. Patents form the single most comprehensive technical resource in the world. There are currently over 45 million patent documents directed towards solving technical problems, the majority of which are the first and only publication of the development described. Furthermore, patent documents generally convey the most recent information. This is so because applicants always try to file their applications as soon as possible on the principle that the first to apply will be granted the patent.

90. Patent documents have a fairly uniform presentation with respect to layout and bibliographical data, and frequently have drawings with explanations. Patent documents disclose technological information by describing the invention in accordance with the requirements of the applied patent law and by indicating the claimed novelty and inventive step with reference to the existing state of the art. They are therefore sources of information not only on what is new (the invention) but also on what is already known (i.e., state of the art), and in many cases furnish a history, in summary form, of the technological progress in the field to which they relate.

91. Patent documents normally disclose complete information on new inventions earlier than other documentary sources of technological information. For example, the invention of television by Baird had its patent published in 1923 and took five years to be disclosed in other forms of literature. Similarly, the jet engine invented by Whittle was patented in 1936 and took 10 years to be disclosed in other forms of literature.

92. Patent documents often contain information which would not be disclosed through articles or journals. Such information is divulged taking into

consideration only the legal protection which the patent affords. Many patents contain an abstract which allows a general idea to be formed of the contents of the documents within a few minutes.

93. Patent documents belonging to the same family (i.e. patent documents published in different countries but relating to the same invention) are frequently in a number of different languages. The reader may choose the document that is in the language most familiar to him. Patent documents also bear "Classification Symbols," for the purposes of maintaining search files and performing state-of-the-art searches. Industrial property offices classify patent documents according to the fields of technology to which their contents relate. The International Patent Classification (IPC) allows retrieval of patent documents belonging to any given branch of technology. Patent documents belonging to a given IPC subdivision contain a highly concentrated supply of usually technically advanced information on a given technological field.

94. Patent documents bear a date, from which conclusions can be drawn as to the age of the invention and to the question of whether the invention they describe is still under legal protection. If the invention is no longer legally protected, it can be exploited without the consent of the patentee.

95. Patent documents indicate the name and address of the applicant, the patentee, and the inventor, or at least one of these. This information allows any potential licensee to contact the person or entity concerned in order to find out under what conditions they may be authorized to exploit the invention.

96. Patent documents often disclose, in addition to concepts concerning the general utility of the invention, detailed information on the possibility of its practical application in industry.

97. Much of the information contained in patent documents has value far beyond the period of legal protection provided. Information designed for one use can have applications in quite different fields at different times and in different parts of the world. Something that originally had limited application in a single field at the time it was discovered might have a greatly expanded application at a much later date, to perhaps solve a very different problem. Often a "new" idea is really an old idea that has a new application or has recently become commercially viable. It can be seen that something long in the

public domain continues to form a valuable part of the "new" technology. Information about such an invention must be identified, modified and used quite freely and legally by all stakeholders involved with technological development.

98. Patent documents cover the entire technological spectrum and form a large accumulated store of technical literature containing a considerable portion of a collective history of technological development since the industrial revolution. Patent documentation as a whole can be considered internally to be an international network of technological information that is on hand, open to consultation and ready for use.

#### b) For What Purpose Can Researchers Use Patent Information In Universities and R&D Institutions?

99. Use of patent information should be an integral part of R&D activities in universities and research organizations as well as for investors, for the following purposes:

- providing technological information for research;
- providing solutions to technical problems;
- identifying alternative technologies;
- evaluating specific technologies offered for acquisition;
- identifying of rights in the public domain;
- identifying the patentability potential of R&D activities at early stages of development;
- avoiding the risk of R&D duplication;
- solving potential disputes involving patents;
- providing assistance during the development and marketing of new products;
- monitoring trends in R&D activities, and;
- monitoring the success of funded R&D activities.

#### (i) Providing Solutions To Technical Problems

100. A search in patent literature can potentially identify solutions to technical problems. Patent documents often discuss the difficulties of a particular process or design, which can frequently be avoided, or will include advantages of a particular process or design.

#### (ii) Identifying Alternative Technologies

101. A search of patent literature could help to identify an alternative solution that is more desirable, more economical, effective, efficient or environmentally beneficial. Economics are a major concern for inventors and statements concerning the economic importance of an invention are routinely included in patent documents. These include such things as the use of cheaper materials, streamlined manufacturing techniques, and a smaller number of parts, as well as providing fewer opportunities for damage and wear and tear. Use of materials and skills more readily available in a particular part of the world is also often included.

#### (iii) Searching For Information In A Specific Field

102. Knowledge of technology in a specific field can be gained through a search of the relevant literature. Valuable information may be provided concerning raw materials, procedures, processes or by-products in order to choose the most favorable conditions under which to implement a new solution or an established solution to a slightly different problem. Such information would also be valuable when entering into negotiations for production skills or processes.

#### (iv) Evaluating Specific Technologies Offered For Acquisition

103. Another problem closely related both to finding alternative technologies and negotiations for products is the evaluation of a specific technology that is available for licensing and offered for acquisition. An evaluation is needed to choose between two or more technologies, about which much information can be gained through a search of patent literature. A review of both present and past technology currently used and unused, in similar and unrelated fields, can also be evaluated.

#### (v) Identifying Potential for Patentability of R&D Activities at Early Stages of Development

104. For a project in the early stages of development, which produces a potentially innovative technical development, further patent searching is valuable before any decision is made on filing a patent application or maintaining secrecy. The searches would help to determine whether the development is likely to be novel and whether, when implemented, it is likely to infringe existing patents.

(vi) Providing Assistance During Development and Marketing of New Products

105. Patent searches are clearly valuable all the way through the process of initiating, developing and marketing a new product or process. They are useful for:

- competitor analysis and marketing recruitment;
- analysis of the patent activities of a given company over a period of several years can give useful pointers to future products that the company may develop;
- looking at the patent holdings of other companies can also be useful in identifying companies which are end-users of a particular product or equipment;
- analysis of the patent holdings of specific inventors within a narrow research area can be used as an aid to recruitment, since it can identify a major player in the field, whose services could then be sought.

(vii) Monitoring Trends in R&D Activities

106. Patent information can also be used to monitor technological trends as well as a competitor's R&D activities. Since patents must be applied for before any public disclosure and are normally published after 18 months, patent information serves potentially as an early warning of future trends in an organization's activities. While the publication of an individual patent does not in itself tell us much about a competitor's intentions, taken together with several similar patents, however, it provides a strong indicator of that company's likely intention to commercialize a product or process.

(viii) Monitoring the Success of Funded R&D Activities at Early Stages of Development

107. Patents have been found to be useful as a measure of the success of funded research and development programs. Once research programs are underway it is necessary to have a base for monitoring their efficiency. By looking at the nature and number of patents granted, it is possible to arrive at some estimate of the success of a program. This is particularly the case where researchers are aware of the basis of assessment and hence tend to patent worthwhile inventions.



(ix) Solving Potential Disputes Involving Patents

108. If a patent is applied for and granted, these searches should be updated regularly throughout this process to ensure that potential conflicts are identified early. Again if disputes do arise, extensive patent literature searches may be vital in determining the real strength of the relevant patents.

(x) Avoiding the Risk of R&D Duplication

109. It is important to complete a patent search in order to establish the state-of-the-art when a new research is being initiated. Not only will it alert the scientist or researcher of previous research in the area, but will also point out potential major competitors whose patents might be in force and be infringed by the results of the proposed new research.

(xi) Identifying Rights in the Public Domain

110. Patents have both a time frame and an area of protection. Patents whose legal protection has elapsed are said to be in the public domain and can be exploited freely without requiring the authorization of the original inventors. A well-developed patent documentation system when appropriately used through an adequate administration infrastructure will readily reveal rights in the public domain, which can be exploited. This facility is very important in African countries where the informal sector and small and medium-sized enterprises are considered major engines for industrial transformation.

**B. Technology Transfer and Generation of Income Through Commercialization of IPRs**

111. Universities and R&D institutions in African countries should strive to improve their financial status by generating income through consultancy, technology transfer and commercialization of IPRs [28-29] using internal resources.

a) Market Evaluation

112. Technology transfer and commercialization initiatives are the means by which research and development and the market place can encounter one another and ideas be transformed into products and new businesses. This is because inventions are not of any use if they are not marketed and



commercialized. The road to commercialization is rough and frustrating. It needs very careful planning, market analysis and evaluation of the various alternatives.

A number of questions must be answered before any decision to market an invention is taken or even before an invention is registered, given that the registration process can be very cumbersome. These include whether the invention can be exploited at a profit as well as the value of the invention and whether there are potential buyers. This will require an assessment of whether there is a market for the products that will result from the invention, and the product life cycle. Furthermore, if the technology is not environmentally friendly it is obvious that the invention is not an ideal technology [29].

#### b) Methods of Commercialization of Intellectual Property

113. Given an invention has economic and commercial value, the inventive institution has the following commercialization and marketing options [29]:

- selling patent rights and/or other IPRs;
- licensing IPRs;
- joint venture or collaboration;
- science parks and business incubators;
- university companies.

##### (i) Selling Patent Rights

114. It is established that most researchers are not good entrepreneurs and most universities and R&D institutions cannot effectively engage in commercial activities. In this connection, the inventor institutions may sell their IPRs to entrepreneurs. The advantage of this option is that it does not entail major expense, although the returns are small compared to other options.

##### (ii) Licensing IPRs

115. As in the case of the outright sale of patents, an inventor institution may not be interested in the commercial exploitation of the invention. The institution may thus enter into a licensing agreement with another company which will commercialize the invention. The inventor institution would in return receive royalties. The advantage here is that the license can be given to a number of entrepreneurs. Many entrepreneurs today manufacture under license. Famous



trade names such as Coca-Cola, Kodak, Nike and Macdonalds are some examples of licensed products.

##### (iii) Joint Venture or Collaboration?

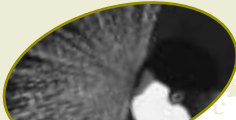
116. Universities and R&D institutions can also transfer their technology through joint ventures or collaboration with entrepreneurs. Recognizing their lack of knowledge in commercial activities, these institutions may forge strategic alliances with the business community in order to exploit their inventions. In this case, the inventor becomes more pro-active by participating in the production process. The major advantage of joint ventures is that the research institution shares the income that accrues from selling manufactured products and benefits from the business knowledge of the entrepreneurial partner. However, this route requires a certain amount of heavy investment.

##### (iv) Science Parks and Business Incubators?

117. Science parks and business incubators are common features within technology-based universities and R&D institutions in a number of countries, such as Brazil, Canada, China, Germany, Indonesia, Japan, Netherlands, Republic of South Korea, Sweden and USA. Science parks and business incubators have given rise to a number of spin-offs. As in the case of joint ventures, such centers feature strategic alliances between research institutions and high technology firms.

##### (v) University Companies

118. At an extreme, a university inventor may opt to establish his or her own business in order to exploit IPRs. Indeed, this option requires a lot of resources, both in terms of financial and human capital. The question of the involvement of university researchers in business creations looking to exploit their inventions has become a very controversial subject. The conflicting interests between the scientific and entrepreneurial roles act as an obstacle to academics' involvement in commercialization. Despite these conflicting views, it is common knowledge that some universities have incubated a number of large multinational companies. For example, Stanford University and Massachusetts Institute of Technology (MIT) have incubated a large number of spin-off companies. The number of companies set up as an offshoot of MIT has increased from 156 to 636 in 20 years. Within





a period of 50 years, MIT has transformed the economy of the State, from its traditional dependence on textiles and footwear, to its current high technology base. In Sweden, Chalmers University of Technology has created 240 companies within 30 years.

### C. Need for Innovation and Invention Support Services for Universities and R&D Institutions in African Countries

#### a) Importance of Technology Transfer Centers

119. Universities and R&D institutions should have in place a department, unit or section, with an appropriate name such as technology transfer office, center for technology management and so on, responsible for the protection and commercial development of inventions and creations. The activities of such a unit should include the following:

- processing and safeguarding patent and copyright agreements;
- determining patentability or copyrightability (including receiving patent disclosures, undertaking patent searches as well as filing applications for patent and copyrights);
- evaluating the commercial potential of an invention;
- obtaining appropriate patent protection;
- locating suitable commercial development partners;
- negotiating and managing licenses.

#### b) Bottlenecks in the Commercial Exploitation of Technology Transfer IPRs Generated by Universities and R&D Institutions in Africa

120. There are several bottlenecks for the commercialization of IPRs by universities and R&D institutions in Africa [30]. These include:

- bureaucracy and civil service ventures;
- lack of clear policies on consultancy, technology transfer and commercialization of IPRs;
- lack of entrepreneurial, management and legal skills;
- lack of awareness of IPRs;
- lack of an intellectual property policy;
- lack of data banks on specialists and research findings from R&D institutions;

- insufficient marketing strategies for products and services;
- weak university-industry links.

#### a) How Do These Factors Affect the Process of the Commercialization of Innovations, Inventions And Research Findings?

121. Most universities and R&D institutions in Africa are characterized by bureaucratic operations and slow decision-making processes. Financial regulations governing the operation of most public institutions are, comparably speaking, more cumbersome than in private enterprises. This, coupled with a civil-service work culture characterized by low productivity, insensitivity to deadlines and quality of service, are the major impediments to universities and R&D institutions doing business with private enterprises.

122. Most universities and R&D institutions do not have in place clear and comprehensive operating guidelines to govern the day-to-day management of consultancy, technology transfer and commercialization of IPRs.

123. Most of the researchers in universities and R&D institutions do not have entrepreneurial skills. Whereas they occasionally have innovative ideas, converting these ideas into business activities is a major problem. The concept of promoting income generation through consultancy, technology transfer, and the commercialization of innovations, inventions and research findings is something new to most researchers in African universities. Another related problem is that few researchers are able to formulate business plans. However, the path towards converting innovation and invention into a business enterprise requires a detailed and well thought out business plan. Furthermore, the process of licensing technology requires negotiation and contract preparation skills which most researchers do not have.

124. A major handicap for the effective transfer of technology and dissemination of research findings from universities and R&D institutions is the lack of intellectual property policies (IPPs). As already shown, an IPP is a prerequisite for the application of commercial activities related to innovations and inventions. The presence of IPP cannot only stimulate innovations and inventions within universities, but also remove the suspicion which may exist between the university administration, researchers and, to some extent, industries. A major factor here is the policy governing the distribution of income from royalties and licenses.



Whereas universities and R&D institutions are urged to develop an IPP, there is a need to have a unit responsible for implementing the policy.

125. Most universities and R&D institutions do not maintain an up to date data bank on research findings by their staff. Such information is at best left with an individual researcher who, after managing to have it published in a reputable journal, updates his or her curriculum vitae and that is the end of it. No unit is concerned with the compilation and maintenance of such data as a way of identifying research findings with commercial potential, which could be marketed for sale to industries for the production of goods and services.

126. Currently, most universities and R&D institutions do not market their services to external clients adequately. As such, potential clients including industries as well as small and medium-sized enterprises do not know of services the universities can offer.

#### b) How Can the Above Bottlenecks be Addressed?

127. In order to address the bottlenecks, there is a need for universities and R&D institutions to have units which are autonomous or semi-autonomous, and are operated in a manner akin to a private enterprise, so as to provide support services for technology transfer and the commercialization of innovation and inventive activities in universities. Such units can offer the following services:

- business incubators;
- technology transfer;
- provision of patent services.

#### (i) Business Incubators

How does a business incubator work?

128. A business incubator coaches researchers and assists in molding their innovative ideas into successful enterprises within a very short time, normally three to five years [30-33]. This is achieved by removing most of the start-up problems so as to enable the entrepreneur to concentrate on the development of the company. Clients may include entrepreneurs direct from universities and R&D institutions, inventors and people from industry. In most cases, the innovative ideas are the result of R&D activities.



Which services do business incubators offer?

129. A business incubator may offer entrepreneurs the following services:

- assistance with issues related to IPRs;
- assistance in the preparation of business plans;
- secretarial and communication services;
- cheaper rent for work space;
- legal and financial assistance;
- marketing;
- post-graduation settlement.

How does a university or R&D institution based business incubator work?

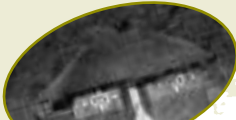
130. Most business incubation centers are large, catering for clients from various institutions, and require the direct involvement of a government authority or municipality. It is, however, possible to form institution-based incubators. Such an incubator would have the following characteristics:

- be located near or within the institution;
- have a formal relationship with the institution - be part of the institution;
- have an informal relationship - as an independent entity - with respect to day-to-day management and operation;
- possibly specialize in specific technology, and;
- possibly have a flexible graduation policy.

What benefits can be obtained from institution-based business incubators?

131. It has been shown that institution-sponsored incubators bring the following benefits to the institutions concerned:

- provide a mechanism for commercialization of institutions R&D results;
- help institutions to partake in the economic development of their countries;
- provide an opportunity for entrepreneurship and business development within the institutions as well as for graduating students.



## (ii) Technology Transfer

Which services would a Technology Transfer Center Offer?

132. A technology transfer center may offer some of the following services [34-36]:

- representation of an institution in national patent offices and patent tribunals;
- promotion amongst the institution's employees of the institution of awareness of IPRs and their benefits;
- securing and safeguarding IPRs nationally and internationally;
- taking measures to prevent contravention and litigation of IPRs nationally;
- undertaking a background search as a planning tool for development projects;
- assisting with the formulation of R&D contracts;
- assisting with the patenting process;
- marketing and commercializing the invention including licensing negotiations;
- providing a complete and detailed technical description of a desired technology;
- conducting a novelty search before a research project starts;
- providing information about protected problem solutions;
- avoiding investment in problems already solved.

133. Past experience from established technology transfer centers has established that:

- patents are effective means of deriving economic values from research development and for enhancing support for research activities. Hundreds of university staff, researchers and their research programs can benefit financially from their patented and licensed technologies;
- patents are often the best way of developing and disseminating a technology. Unless a patent exists, it is unlikely that an industry will invest in the process of developing and commercializing a product and many inventions will simply "sit on the shelf" and benefit no one;

- patents are frequently essential as a basis for starting companies based on university inventions and discoveries;
  - the process of obtaining a patent and marketing it to an industry provides a highly effective means of developing meaningful interaction between a university and industry, and strengthening university-industry links.
- c) Examples of Innovation and Invention Support Structures in a Number of Selected Universities

134. There are several examples to learn from. The table below shows a number of support structures for 10 selected universities in the United States of America.

No.	University	Support structure in place
1	Cleveland State University	University Office for Research and Economic Development
2	Rice University	Office of Sponsored Research
3	Duke University	Office of Science and Technology
4	Cornell University	Research Foundation
5	Washington University	Center for Technology Management
6	Indiana University, USA	Technology Transfer Office
7	Indiana State University	Technology Transfer Office
8	University of Massachusetts	University Office of Commercial Ventures and Intellectual Property
9	Stanford University	University Office for Technology Licensing
10	University of West Australia	Technology and Innovation Management Ltd.

## V. Need For An IPP In African Universities and R&D Institutions

135. There are several universities in developed countries which have formulated IPPs [37-50]. This chapter provides a summary of those policies.

### **A. Objectives of an IPP**

136. There are several stakeholders in the process of commercializing innovations, inventions and research findings. These include the following:

- universities and R&D institutions;
- researchers or inventors and their research group, department, faculty, college, etc.;
- research assistants;
- students;
- postgraduate and postdoctoral fellows;
- guest researchers;
- sponsors (industry, government, other organizations);
- technology transfer unit;
- national patent offices;
- the public.

137. An IPP should harmonize the conflicting interests of all stakeholders in the process of generating and commercializing of IPRs. Generally an IPP should aim at achieving the following objectives:

- creating an environment that encourages and expedites the dissemination of inventions and new knowledge generated by researchers for the greatest possible public benefit;
- protecting the traditional rights of scholars to control the products of their scholarly endeavors;
- ensuring that the commercial results, financial or otherwise, are distributed in a fair and equitable manner that recognizes the contributions of all stakeholders;
- ensuring that both intellectual property and other research products are made available to the public through an efficient and timely technology transfer process;

- promoting, preserving, encouraging and aiding scientific investigation and research;
- establishing standards for determining the rights and obligations of a university, as well as inventors and their sponsors with respect to inventions;
- encouraging, assisting and providing mutually beneficial rewards to a university or R&D institution and its members who transfer intellectual property to the public;
- ensuring compliance with applicable laws and regulations, and enabling a university or R&D institution to secure sponsored funding at all levels of research.

### **B. Issues to be Considered by an IPP**

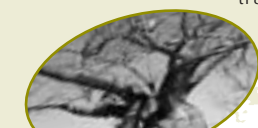
138. In order to harmonize the various conflicting interests of stakeholders and realize broad based objectives, an IPP for universities and R&D institutions should discuss some of the following issues:

- coverage of IPP;
- ownership of intellectual property;
- disclosure of intellectual property;
- marketing, commercialization and licensing of patents;
- income distribution;
- rights and obligations of an inventor and the institution.

### **C. Coverage of IPP**

139. Universities and R&D institutions need to define intellectual property broadly and their policies should be comprehensive in their coverage and holistic in their approach. However, depending on the direction of R&D activities, each institution would decide on the type of intellectual property to be included in the IPP. This may include:

- patents;
- utility models;
- industrial designs;
- copyright in literary works;



- trade and service marks;
- new plant varieties;
- trade secrets.

#### D. Right of Ownership

##### a) Claim of Ownership of an Invention by a University or R&D Institution

140. A university or R&D institution would normally own any intellectual property that is created by members of staff, students, guest researchers and so on, in the course of their employment and responsibilities, or by any person who makes significant use of the institution's resources in connection with the development of such intellectual property.

141. University resources may be defined as all the tangible resources provided by a university or R&D institution to inventors including:

- office, laboratory and studio space and equipment;
- computer hardware, software and support;
- secretarial services;
- research, teaching and laboratory assistants;
- supplies and utilities;
- funding for research and teaching activities, travel and other funding or reimbursements.

142. Each university or R&D institution is encouraged to define what does not constitute significant use of its resources. In some universities, use of library facilities, facilities available to the general public, and occasional use of office equipment and staff may not ordinarily be considered "significant use" of an institution's facilities and equipment.

143. In addition, researchers may not be considered to have made significant use of university or R&D institution resources if:

- the inventor receives advance written approval of the proposed use from the institution;
- academic or other R&D uses of facilities and equipment have priority;

- the inventor compensates the institution for the fair market value of the facilities and equipment (as actually charged by the institution to outside users);
- the inventor is not using the institution's committed time;
- the inventor does not use any institution funds in connection with the activity.

144. Normally, a university or R&D institution will own any intellectual property (including Exempted Scholarly Works) that is created by anybody who is specifically hired or commissioned by the institution for that purpose, unless otherwise provided by written agreement between such an individual and the institution.

145. A Participation Agreement is a way of enforcing an IPP, and universities and R&D institutions are advised to develop and adopt a Participation Agreement that confirms acceptance of the policy by employees, students and guest researchers, and assigns to the university or R&D institution all rights in any intellectual property in which the university or R&D institution may assert ownership.

##### b) Claim of Ownership by a Sponsor

146. Ownership of any intellectual property (including "exempted scholarly works") that is created in the course of research funded by a sponsor, pursuant to a grant or research agreement, or which is subject to a materials transfer agreement, confidential disclosure agreement or other legal obligation affecting ownership, will be governed by the terms of such a grant or agreement, as approved by the institution, although normally the institution would claim ownership.

147. Ownership of intellectual property that is made, discovered or created through government funding would depend on the law governing intellectual property in respective countries. In some countries (e.g., USA), while a university or R&D institution is assigned the rights to intellectual property generated during the course of government-funded research activities, the government retains the option to claim ownership in certain circumstances.

148. In some countries, intellectual property developed using government funds is owned by the government. When such contracts are in force, an R&D institution must require the employees working under such funding to assign ownership of the intellectual property to it for conveyance to the government.

149. In cases in which a university or R&D institution is a co-inventor together with an individual from another institution or business entity, and in which income is shared between the participating entities, patents shall normally be owned jointly by the participating institutions and rights of use relating to the invention and the distribution of derived royalties between the institutions shall normally be negotiated after a confidential invention disclosure, but prior to the initiation of patent filing.

#### c) Claim of Ownership by an Individual

150. If a university cannot or decides not to proceed in a timely manner to patent and/or license an invention, it may reassign ownership to the inventor upon request. This should be to the extent possible under the terms of any agreements that supported or related to the work.

151. Generally, patent rights to an invention made by an individual in his or her own time and without the use of an institution's resources belong to the inventor. In such cases, the institution shall not make any claim on royalties.

152. If an inventor creates intellectual property without significant use of an institution's resources, but the intellectual property closely resembles a specific research project that the inventor has conducted at the institution, it may be argued that the intellectual property was developed with the use of institutional resources. These circumstances could give rise to a dispute between the institution and the inventor (or a company for whom the inventor acts as a consultant) over ownership of the intellectual property. This would particularly be the case when such intellectual property gains substantial commercial value. In order to avoid these potentially litigious situations, members of staff should be obliged to disclose to their institutions any intellectual property that closely resembles a specific research project at the institutions.

153. Generally, students shall own any intellectual property that they make, discover or create in the course of their research unless:

- they have received financial support from the university or R&D institution in the form of wages, a salary, stipend, or research grants;
- they have made significant use of R&D institution resources in connection with the research; or,



- the research was funded by a sponsor pursuant to a grant or sponsored research agreement, or is subject to a materials transfer agreement, confidential disclosure agreement, or other legal obligation that restricts intellectual property ownership.

154. Texts of students thesis and dissertations as well as works derived therefrom are considered "exempted scholarly works." The students will therefore own the copyright to the "scholarly work," subject to a royalty-free license allowing the institution to reproduce and publish the "scholarly work." Students are normally allowed to publish their thesis and dissertations, unless they have agreed in writing to restrictions that preclude or delay publication.

155. University research contracts should protect the right of faculties, students and other employees to publish the results of their work, but may allow for brief delays to file patent applications or otherwise protect intellectual property.

## E. Disclosure of Inventions

### a) General Information

156. It is very advisable for universities and R&D institutions to develop and adopt a participation agreement or a patent and copyright agreement to govern disclosures of inventions. Generally speaking all researchers should be obliged to disclose all potentially patentable inventions conceived or first put into practice, in whole or in part of the course of their institutional responsibilities, or with more than incidental use of the institution's resources.

157. A disclosure is typically used to give a formal description of an invention that is made confidentially by the inventor to his/her employer. An invention disclosure is a document which provides information about the inventor(s), what was invented, the circumstances leading to the invention, and facts concerning subsequent activities. It provides the basis for determining patentability and the technical information for drafting a patent application. Such a disclosure is the "first alert" to the university that an invention has been produced. An invention disclosure is also used to report technology that may not be patented but is protected by other means such as copyright.





158. An invention disclosure is also used to report technology that may not be patentable but is protected by other means such as copyright.

159. University and R&D institutions should develop and adopt disclosure forms to assist inventors. If a university or R&D institution does not have a technology transfer unit, there should be a committee entrusted with the responsibility of receiving and processing disclosed potentially patentable inventions.

160. The key information required on the disclosure form should include:

- the invention title, names of all inventors and the descriptions of the invention;
- sponsorship, if any;
- dates of conception and putting into practice;
- publication dates, existing or projected, if any.

161. It is important to record an invention at the earliest possible stage. The record should include a written description which is as complete and accurate as possible. The description should be written to allow another person reading it to understand and reproduce the invention. The description should be written preferably in a bound notebook with numbered pages, in ink. The disclosure should be understood, witnessed and signed by a non-inventor. These actions are designed to substantiate the fact that the invention was produced on a certain date.

162. Submitting a disclosure is the first formal step in obtaining proper intellectual property protection through a university or R&D institution. Inventors are strongly encouraged to submit invention disclosures early in their invention development process so as to avoid any potential problems. The disclosure should be submitted with a written description of the invention (explanatory drawing, data, abstracts and summaries may be sufficient). The description can be brief and is often a draft of a manuscript prepared for publication. The invention description should state what the invention is, what it does and why it appears to be significant. Sketches or diagrams are helpful. A description of the most relevant technology known to the inventor may be required. The written description must be sufficiently detailed to permit a searcher or patent professional to understand the invention and to assess its patentability.



163. Premature disclosure is the release of information concerning an invention before a patent application is filed. Premature disclosure includes abstracts, poster sessions, shelved theses or even certain talks describing an invention to an open audience, even if it is given by someone who is ultimately judged not to be the inventor. Such premature disclosure may disqualify an invention for patentability purposes and in most countries, it definitely does so.

#### b) The Obligations of a University or R&D Institution During and After Invention Disclosure

164. In all cases of intellectual property disclosed by a member of staff for possible commercialization, the institution concerned is obliged to determine its commercial potential.

165. All intellectual property disclosures should normally be considered confidential by the institution.

166. Universities and R&D institutions should:

- educate their staff regarding intellectual property and tangible research property;
- provide support as deemed necessary or desirable;
- obtain legal protection for their intellectual property;
- facilitate the transfer of intellectual property for public use;
- develop mechanisms within the institution for the licensing and management of technology;
- provide legal support as deemed necessary and desirable to defend and protect the interests of the institutions and creators of intellectual property against third party claims or unauthorized use;
- promptly report to research sponsors any intellectual property arising from such R&D activities as are required by research and licensing agreements, and applicable laws and regulations;
- return to the creator the ownership of intellectual property which the institution decides not to patent and license;
- provide a process for settlement of disputes arising between and among the institution, sponsors and creators regarding intellectual property;
- publish or advertise the technology as deemed appropriate;
- assist the creator in finding a partner for technological development or a sponsor;



- endeavor to negotiate and manage agreements to the best advantage of the creator and the institution.

#### c) The Obligations of the Individual Inventor During and After Invention Disclosure

167. An inventor of new intellectual property is obliged to:

- disclose it in a thorough and timely manner;
- provide all the required assistance throughout the technology transfer process;
- arrange for the retention of all records and documents necessary for the protection of the intellectual property;
- abide by all commitments made in license, sponsored research and other agreements;
- disclose all potential conflicts of interest to the university;
- apply reasonable judgement as to whether an invention has potential for commercial marketing;
- disclose his or her invention as soon as possible and delay public disclosure of the invention until the evaluation process is complete and a patent application is filed;
- be aware that public disclosure of an invention prior to completion of the evaluation process and filing of a patent application will adversely affect the commercial value of the invention and may therefore decrease the likelihood that the institution will proceed with commercialization of that invention.

### F. Market Evaluation and Licensing

168. It is essential for any patentable invention to be analyzed in terms of its industrial relevance and commercial potential. Universities, together with inventors, should endeavor to answer the following questions [50]:

- does the technology offer a cheaper and/or better way of accomplishing something?
- are competing technologies available and how much better is the invention?
- does the invention provide a technological answer to an existing problem?
- does it have the potential to create a new market?
- how much investment, in terms of both time and money, will be required to bring the invention to the market place?
- will the inventors continue to work on the invention?

- what will the potential pay-off be for a company that invests in the development of the invention?

169. The following are some of the checklists of items that need to be considered by universities when discussing a licensing agreement:

- particulars of the parties;
- definitions of territory and scope;
- obligations of the parties;
- nature of agreement;
- nature of intellectual property;
- property to be licensed or assigned, or the subject of the agreement;
- ownership of property;
- developments with regard to future patents, designs, inventions, technical information, know-how, or improvements to any of the foregoing;
- nature and extent of rights granted;
- whether technical assistance is to be given;
- whether either party has the right to assign the agreement or benefits;
- what the position of subsidiaries of the licensee is under the agreement?
- what the right of the licensee to grant sub-licences is with respect to licensed property;
- what form the sub-licence is to take;
- what the licensee's responsibility is for acts of the sub-licensee;
- what the licensee's responsibility is for maintaining confidentiality with respect to know-how;
- is the licensee to have the right to sub-contract the manufacture of articles derived from licensed property?
- payments and royalties;
- what provision is to be made for preservation of copyright?
- what is to be the date of commencement of the agreement?
- what is the duration of the agreement?

### G. Distribution of Income

170. The general principle for the distribution of income is as follows:

- the university first recovers all the expenses associated with protection and exploitation of the patent or copyright;
- the net income is shared between the inventor and the institution;

- the general trend is that the inventor percentage share decreases, whereas that of the institution increases with the rise in total net revenue. For example, one American university gives the inventor 50 per cent for the first \$100,000 of net revenue, 40 per cent for the next \$300,000, 30 per cent for the next \$600,000 and 25 per cent for net income in excess of \$100,000.

171. Each institution should define the stakeholders within the institution with whom the institution's income may be shared. These may include the following:

- inventor's research group and inventor's faculty, campus etc;
- patent fund;
- operation of technology transfer center;
- research fund;
- scholarship fund and graduate education;
- inventor's research group, department, faculty and college;
- university.



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51. "BREEDER" MEANS  
The person who bred, or discovered and developed, a variety,  
the person who is the employer of the aforementioned person or who has commissioned the latter's work, where the laws of the relevant Contracting Party so provide, or  
the successor in title of the first or second aforementioned person, as the case may be.





**JAPAN PATENT OFFICE (JPO) LONG TERM STUDY CUM  
RESEARCH FELLOWSHIP PROGRAM**

OCTOBER 2010 – MARCH 2011

**Final Report**

**RESEARCH THEME:**

*Study on implementation of the Japanese Model for  
commercialization to outbreak innovation through technology  
transfer from universities to industries*

Prepared by:

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INTELLECTUAL PROPERTY CORPORATION OF MALAYSIA  
(MyIPO)

30 March 2011

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## **CHAPTER I – Rational and Overview of Research Mission**

### **Introduction**

The purpose of this research report is in conjunction and elaborates of researcher mission for his stay under Japanese Patent Office (JPO) Long Term Study cum Research Fellowship Program. It is acknowledged that Japan is develop country and advanced in science and technology. Intellectual Property Rights and utilization of patent are synonym to Japanese people. Malaysia is still in developing and looking forward for further improvement either in science and technology, also in intellectual property aspects. This research paper will try to explore Japanese Model in development and achievement to be an intellectual property nation based. Content of this research paper is translation of the researcher findings based on his past experienced and experiences that his undergo during this fellowship program. The research is focus on how universities as centre of knowledge capable of taking greater part in utilization of research and development (R&D) research findings to be useful to society.

### **Overview on Malaysian experiences in promoting intellectual property as paradigm change as valuable knowledge based economy**

Currently, knowledge based economy becomes significant to world economy segment. When we talks about knowledge, our sight will looking to source of developing better education systems and also producing better resource man power to put in jobs which this measurement as foundation aspects to assist development in economy of any developing country such as Malaysia. After independence on 31 August 1957, Malaysia has its first public university in year 1961, and currently has 20 public universities. Malaysia also has open more polytechnic which currently amount of 27 polytechnics. Besides of public universities, Malaysia developed its education systems by introducing Private Higher Education Institutions (HEIs) since 1980s which offers courses of study at the certificate and diploma levels in collaboration with foreign universities and professional bodies from United Kingdom (UK), United States (US), Canada, Australia and New Zealand. Up until 31



December 2009, there are 20 Private HEIs of University and University College respectively, 5 Foreign University Branch campuses and 393 colleges<sup>1</sup>.

In encouraging research and development activities amongst Malaysia public universities, the Malaysian government had classified universities to three categories namely, research universities, comprehensive universities and focused universities. There are five (5) public universities that been recognised as research universities. This recognition is only given to such university that fulfil requirements as list down by the Ministry of Higher Education (MOHE). Objectives of research universities are as follows; to increase research and development and commercialization activities; to increase the intake of post graduates and post doctorate fellows; to increase the number of academic staff with PhD qualifications; to create and strengthen Centres of Excellence and to increase the intake of foreign students and elevate the international ranking of Malaysian Higher Education Institutions. This recognition is challenges to the others university to have such status of recognition. However, the others universities are not less important in contribute to research and development activities in its own institutions.

The real challenges for Malaysia research universities and others public universities are to fulfil principal of *"utilization to society"*. Means that research finding will not dead lock but will widely used at home and abroad (commercialised used). Good inventions shall not waste due to knowledge profile for academic purposes only. Generally, in traditional ways of education on the objectives and functions of university are produce graduation students to have better chances for employment career and in same time have ability in producing new ideas in solving society problems for better life through research and development activities. However, nowadays, society has high expectation to universities in field of research and development at universities laboratory. The society had acknowledged universities capabilities and credibility's in having new creation over needs of business market and also consumer needs. This means that universities function in R&D activities had changed towards needs of R&D activities that capable provide real-world

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<sup>1</sup> <http://jpt.mohe.gov.my/eng/index.php>

solution by creation of opportunities in market demand through commercialization of innovation.

Malaysia economy system had being transformed from agriculture based economy (1957 to late 1970s), resource-led economy (1980s to middle 1990s) and now under innovation led economy (late 1990s to 2020). The Government of Malaysia had acknowledged that it is importance for Malaysia to consider innovation as economy driven to become more competitive in domestic and international economy cycle. The current Prime Minister inviting Malaysian to have such thinking in his speech *“The remarkable future that we can achieve together in Malaysia **if we spark innovation, bring public and private sector expertise together in the common good, focus on delivery, have the courage to make the right choices for our country, and maintain our commitment to 1Malaysia. We have ambitious plans, but they are developed in the full knowledge that we can meet our goals as a talented, innovative and skilled nation.**”*<sup>2</sup>

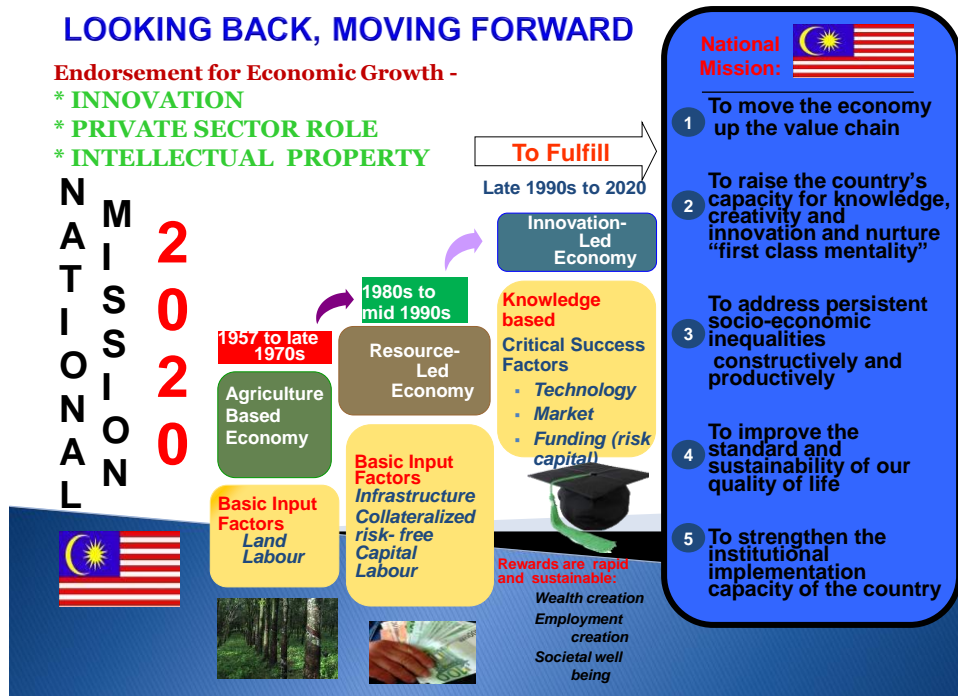
This economy reform is needed for better life and creates more job opportunity. The Malaysian had experienced changes of economy transformed since independence until current economy scheme. Generally, Malaysia as developing country has many rooms to improve its economy stability and always responds to world economy trends. Through this experience and supported by its natural resources and talented people in Malaysia, capable to have innovation based country has positive reaction from all sectors which looking forward for better improvement. Dato’ Seri Najib Tun Abdul Razak, the Malaysia Prime Minister in his speech in remind Malaysian of capability and encouraged for Malaysian to involved in this new era of knowledge based economy and innovation stated:

*“The New Economic Model is the roadmap that will propel Malaysia into the future. We have, since independence, successfully transformed our nation from an agriculture economy into a modern industrial economy. The NEM seeks to put us back on track in our forward momentum. We cannot afford to*

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<sup>2</sup> Prime Minister Speech, National Chamber of Commerce and Industry of Malaysia (NCCIM) Dinner; Kuala Lumpur, 12 February 2010

fall behind the curve in the pace, breadth and depth of change and reform lest we become another victim of the middle-income trap.”<sup>3</sup>



## Research Objectives

It is an honour and great opportunities for the researcher having six-months stay under this fellowship program to get to know, study and understand of Japanese Model in this university-industry-government (U-I-G) linked that Japan had experience and went through. Japan and Malaysia has put effort between both countries in assist Malaysia to develop its science and technology, and now extend to intellectual property fields especially in utilization of patent. The researcher felt that attending this program is likely continuity of look east policy which launched by 4<sup>th</sup> Malaysia Prime Minister, Tun Dr. Mahathir bin Mohamad. After six months in his office, on 8hb. February 1982 during "5th Joint Annual Conference of MAJECA/JAMECA" at Hilton Kuala Lumpur, Malaysia, he announced look east policy. This look east policy is an initiative to learn from the experiences of Japan (and Korea) in the nation-building of Malaysia. He considered that the secret of

<sup>3</sup> Dato Seri Najib Tun Abdul Razak , Grand Opening of Borneo Convention Centre, Kuching, Sarawak 2 March 2010

Japanese success and its remarkable development lies in its labour ethics, morale, and management capability. He felt a programme enabling that young Malaysians to learn in Japan would contribute to the economic and social development of Malaysia.

In considering and implementing Look East Policy and inspiring technology culture for Malaysian, the former prime minister, directed establishment of national car under Government Linked Company (GLC), *Perusahaan Otomobil Nasional Berhad* (PROTON) was incorporated in May 7, 1983 to manufacture, assemble and sell motor vehicles and related products, including accessories, spare parts and other components. Based on cooperation and technology transfer includes know-how from Japanese car maker Mitsubishi Motors, production of the first model, the Proton Saga began in September 1985 at its first manufacturing plant in Shah Alam, Selangor. Malaysia's first car, brand name "Proton Saga",  commercially launched on July 9, 1985.

In his speech, he mentions that *"The people of East-Asia had been Looking East long before Malaysia adopted the Look East Policy. When Japan started modernizing during the Meiji Restoration, East Asians who were then faced with aggressive European and American free traders to open their countries for trade, looked at Japan's handling of this problem"*<sup>4</sup>

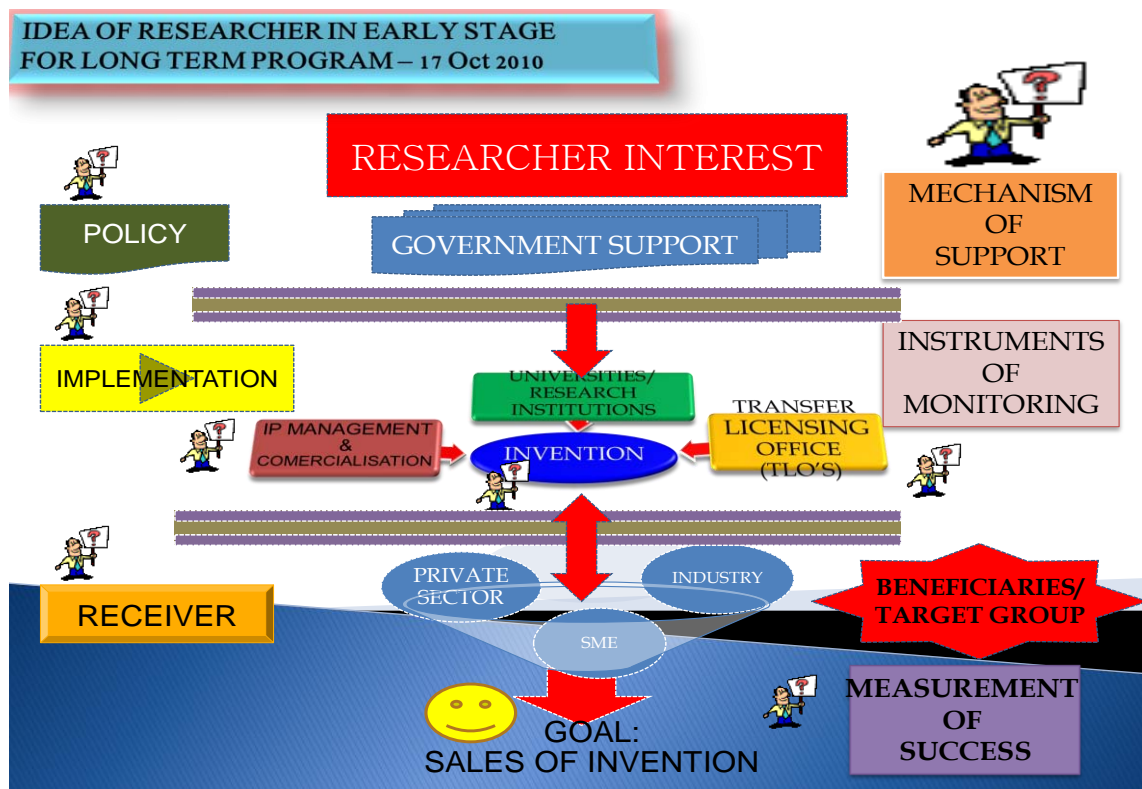
Therefore, experienced in person of the researcher during his stay here in Japan, beside study cum research on his theme, the researcher also has opportunity to having some understanding on Japanese Model in promoting and developing Japan Intellectual Property Systems and achievement in executing national policy of intellectual property nation based.

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<sup>4</sup> <http://www.mofa.go.jp/region/asia-paci/malaysia/pmv0212/speech.html>) Keynote Address at the Seminar for the 20th Anniversary of the Look East Policy, Visit to Japan by Dato' Seri Dr. Mahathir bin Mohamad, Prime Minister of Malaysia, 12 December 2002

The objectives of research theme will consist of the following steps.

- a. Study the policies Government of Japan and its mechanism in supporting and encouraging invention activities;
- b. To study the implementation and instruments of monitoring in executing the such policies at the implementing stage;
- c. To study and understand how technology transfer office in Japan Universities works;
- d. To understand possibilities of transferring technology from technology transfer office to industries
- e. Possible to made comparison between Japanese Model in intellectual property management and commercialization activities of transfer technology office and Malaysian practice in same issues;
- f. Possible gives such recommendations in capacity building in improving functions of technology transfer office for Malaysia TLO's activities.





## **Research Methodology**

It is intention of the researcher to having a better understanding of Japan Universities in operating technology transfer activities or technology licensing office (TLO). An effort has been made to fulfil the researcher interest. The researcher during in his early stages of this program discovered lots of information that should be gathered in understands Japanese Model in its technology transfer activities and programs in relation to Intellectual Property Strategy Program for build up Intellectual Property Nation Based.

This long term program is an eye opener to enhance the researcher knowledge in technology transfer activities. It is seems that this long term program is beginning to have better understand in this area of studies. Even though, the researcher does not have opportunity made attachment in any TLO's office for experienced real situation of operating TLO but experienced attended few meetings, interviews and seminar had being good starter for the researcher his line of direction to gain more knowledge in this subject matter for future knowledge gain.

Therefore, study cum research is main methodology of the researcher in preparing this research report. This report is consists efforts made by Japan and Malaysia experience in managing intellectual property from idea to commercialization, in particular area of science and technology promotion policy, innovation efforts and also universities involvements in technology transfer and patent utilization.

Methodology and extracting information that the researcher made for this research report as follows;

### ***a. Japan Perspectives***

- i. Interview, discussion and meeting with few universities, TLO's representative; Universities Transfer Technology Associations of Japan; relevant agencies and officials in implementing IP Strategy Program and promoting Intellectual Property Systems and IP advisors;
- ii. Attended seminar provided by Asia-Pacific Industrial Property Centre (APIC) either in APIC or outside APIC; and

- iii. Reading material provided by APIC and suggested relevant website relates to research theme

***b. Malaysia Perspectives***

- i. Sources for Malaysia perspectives are taken from official website of relevant ministries and universities namely Ministry of Science, Technology and Innovation (MOSTI); Ministry of High Education (MOHE), official websites of various Malaysia Public universities and Intellectual Property Corporation of Malaysia (MyIPO).

There were attempts to circulate questionnaires to relevant target groups. However, due to constraint of time, the draft questionnaire was not able to circulate. Nevertheless, data gathering for purpose for this research report from target groups being replaced from other sources that the researcher considered as benchmark in understanding the researcher mission and objectives.

**Expected Benefits**

Purposed of the researcher attending this fellowship program with intention and expectation to benefit from this program as follows;

- i. To understand purpose, function and operation of technology transfer activities especially linkage between universities, industries and government (U-I-G);
- ii. To enhance the researcher knowledge in collaborating technology transfer and intellectual property environment;
- iii. Capable of the researcher to share his experience with Malaysian Universities and other government agencies on Japanese Model in implementing U-I-G linked program; and
- iv. To allow the researcher gather input and information for his future line of direction to understand the importance of intellectual property systems.

## **CHAPTER II - Study on development of Japanese Model towards Intellectual Property based nation: encouraging innovation and invention through Intellectual Property**

### **Introduction**

To understand Japanese Model in build up intellectual property based nation, we should study from the Meiji Era until start up of Intellectual Property Strategic Headquarters. Japan had experience economy wave, fall and up of its economy Gross Domestic Profit (GDP). Even though, Japan had lead in innovation activities, Japan still improving in fining tune of economic thrust.

Japan had high Gross Domestic Profit (GDP) in early 60's. However, oil crisis in early 70's made Japan GDP low and later growth slowly but not achieved as experienced in early 60's. Again, Japan being involved another economy crisis which called as Collapse of Bubble Economy. The bubble economy situation, needs Japan to move more serious in developed its economy growth through technological products based.

In addressing uncertainty on economy growth in Japan, the Prime Minister Junichiro Koizumi on February 2002 in the Parliament (Diet) makes announcement which makes Japan more revolving in technology and innovation creative works in future. The Japanese Premier declared that, *“in order to enhance the international competitiveness of its industries, Japan needs to strategically protect and utilize the intellectual properties that are derived from research and creative activities”*. This announcement is starting point towards making Japan as Intellectual Property Nation Based<sup>5</sup>.

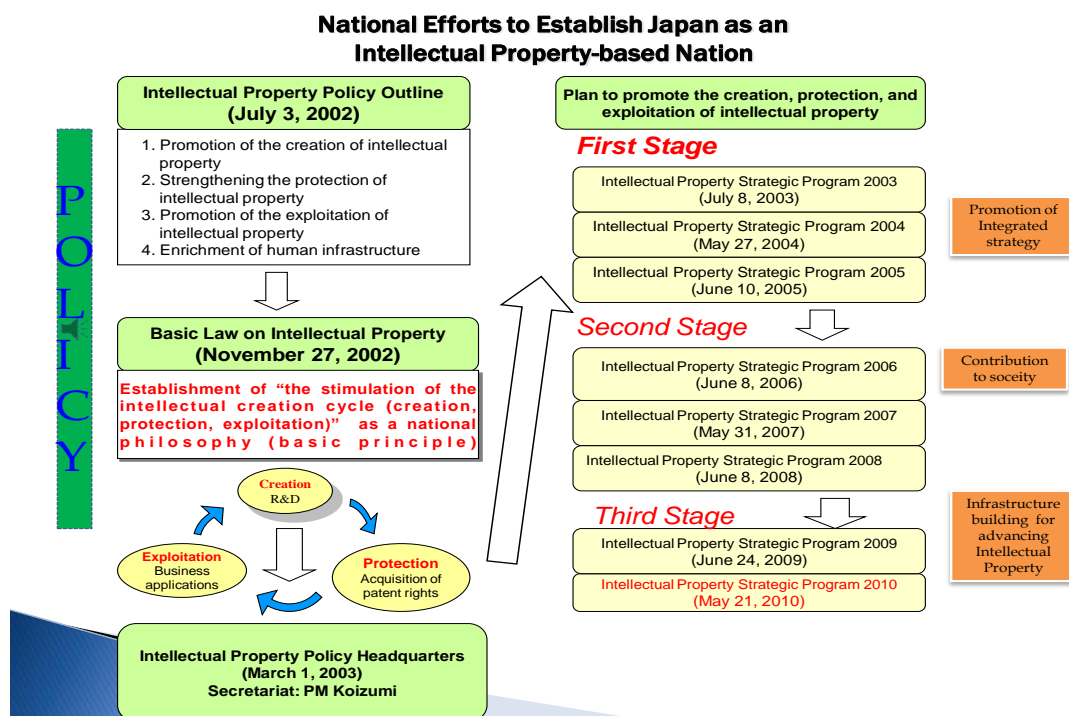
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<sup>5</sup> [http://www.kantei.go.jp/foreign/koizumispeech/2002/02/04sisei\\_e.html](http://www.kantei.go.jp/foreign/koizumispeech/2002/02/04sisei_e.html)

## Implementing Nation Intellectual Property Nation Based

As result of the Primer announcement, the Government of Japan established the Intellectual Property Strategy Council in March 2002 which formulated the Intellectual Property Policy Outlines<sup>6</sup>. The IP Policy Outlines providing a brief analysis of economic and social environment surrounding Japan at that time and called for taking a comprehensive approach for creation, protection and exploitation of intellectual property as well as development of human resources to support the intellectual property cycle to realize the goal of making Japan an IP based nation.

To implement the measures contained in the Intellectual Property Policy Outline, Basic Law of Intellectual Property (Law No.122 of 2002)<sup>7</sup>. was enacted in November, 2002 which provided for establishment of the Intellectual Property Strategy Headquarters for promoting measures for the creation, protection and exploitation of intellectual property in a focused and planned manner. The Headquarter was established in the Cabinet Secretariat in July, 2003 with Prime Minister of Japan as its Chairman and its members drawn from the Government, Academia and Industry.



<sup>6</sup> [http://www.kantei.go.jp/foreign/policy/titeki/kettei/020703taikou\\_e.html](http://www.kantei.go.jp/foreign/policy/titeki/kettei/020703taikou_e.html)

<sup>7</sup> [http://www.kantei.go.jp/foreign/policy/titeki/hourei/021204kihon\\_e.pdf](http://www.kantei.go.jp/foreign/policy/titeki/hourei/021204kihon_e.pdf)

The Headquarters has its own secretariat, comprised of bureaucrats dispatched from ministries and agencies in charge of various aspects of intellectual property. This bureaucratic “think-tank” was led by Mr. Hisamitsu Arai, a former Japanese Patent Office (“JPO”) Commissioner. Headquarters bureaucrats function as liaison officers for the ministries and agencies from which they are dispatched so that policies and legislation developed by the Headquarters are executed effectively and uniformly throughout the government.

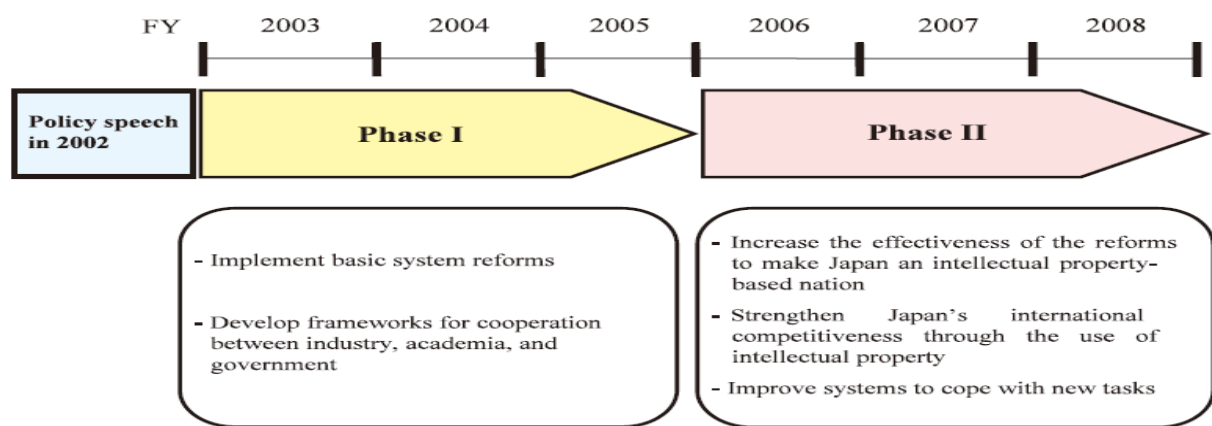
In addition of creating this secretariat, the Headquarters executed the national strategy by developing a program for promoting creation, protection, and exploitation of intellectual property; listing action plans; and reviewing the execution of such plans by ministries and agencies. Since the publication of its first program in July 2003, the Headquarters has published revised annual programs, each listing more than two hundred action plans. Although the Headquarters does not directly execute these plans, it makes clear in the program which ministries and agencies are responsible for plan execution and organizes its own task force to develop policies to execute the action plans for the most important issues requiring strong leadership. Strong leadership was necessary to execute action plans that the ministries had already failed to execute prior to the creation of the Headquarters.

The national strategy of intellectual property has conveyed important message to various fields in public and private sectors in implementing and achievement of this IP nation based objectives. Involvement of private and industry sector are highly needed their attention in promoting of integrated strategy which includes advanced management strategy, research and development strategy and intellectual property strategy. For universities and research institutions it is highly expectation better improvement of intellectual property mindset contribution to society through intellectual property and for government arms in various government agencies support and as mechanism to build up infrastructures for advancing intellectual property.



## Mechanism of Support by Government and Others Agencies in Implementing Intellectual Property Strategic Program

The IP Strategy Headquarters adopted the first strategy Program called “Intellectual Property Strategic Program” for creation, protection and exploitation of Intellectual Property in July 2003. Since then the program has been reviewed and renewed on a yearly basis. The three years period from 2003 to 2005 was designated as Phase I of the development. During this period the Government improved systems and frameworks. In the following three year period from 2006 to 2008, the Government with the aim of achieving the most advanced IP based nation in the world, is addressing new tasks while producing material results from the reforms developed in the first phase<sup>8</sup>. **JPO Annual Report 2007**



During the Phase I of the development, four Task Forces was also established by the IP Strategy Headquarters to further study and deliberate on important IP issues. These were (i) Task Force on strengthening of the Foundation for Right Protection (ii) Task Force on the State of Patent Protection Relevant to the Medical Acts, (iii) Task Force on Content, and (iv) Task Force on Intellectual Creation Cycle.

Japan Patent Office (JPO) as agency concern in administered and strengthens intellectual property in Japan play a major role in implementing the IP Strategic program. In first action, promoting IP awareness is agenda that it's achieved its mission. Having promoting IP for raising public awareness about IPRs through seminar, holdings meetings and disseminating publication on IP is continuity projects that be made from beginning until now.

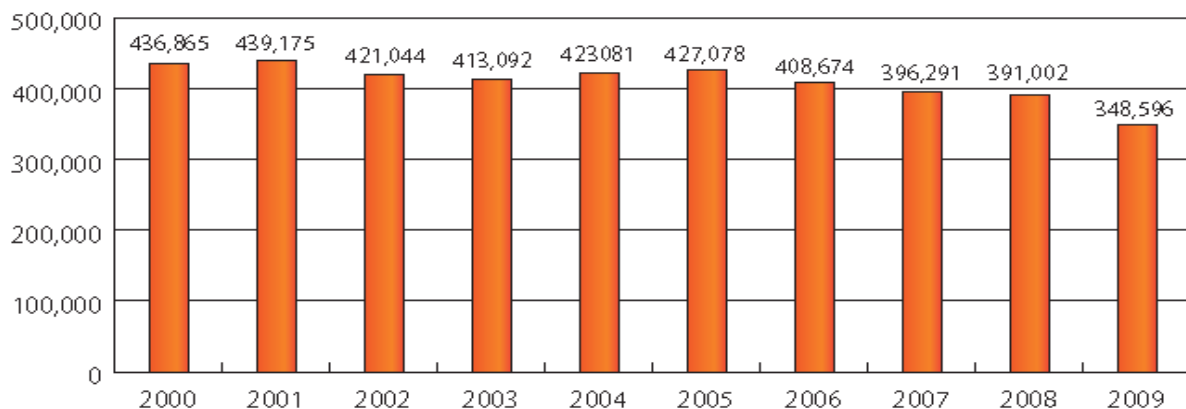
<sup>8</sup> JPO Annual Report 2007

JPO has established Patent Offices in each Regional Bureau of Economy, Trade and Industry. At these Patent Offices, professional staff offer consulting and reference services in IPR matters in response to inquiries concerning various subjects including basic matters and practical application procedure ranging from application filing to registration. The various types of services provided are listed below:

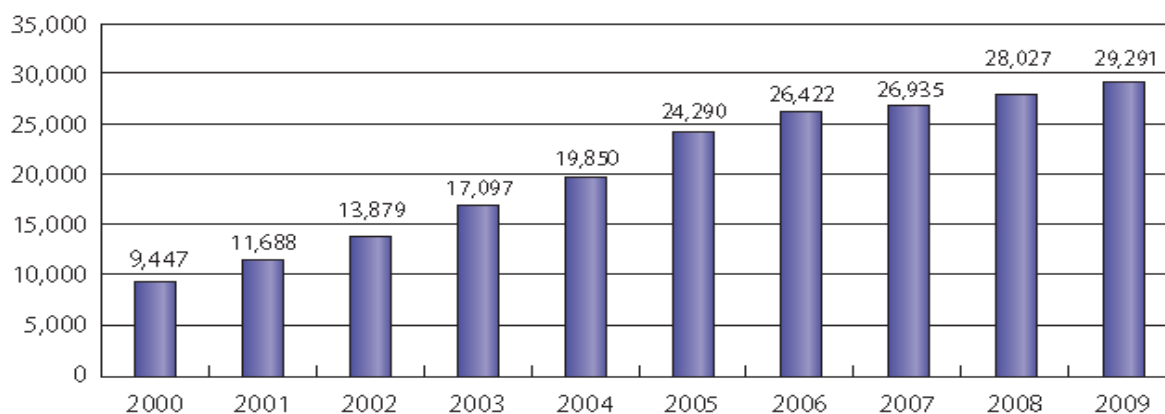
- To provide guidance and consultation over the whole range of industrial property right related processes, from application to registration.
- To browse industrial property right related books and documents.
- To issue the certified copies of patent registers.
- Interview/examination of patent application through video-conferencing.
- To introduce the patent support system ranging from application to registration.
- To hold seminars and briefing sessions pertaining to various types of IPRs.

The activities of each Patent Office in the regional bureaus are executed independently. However, from time to time JPO cooperates with any of the offices upon request for selection of the instructors or the provisions of IPR activities.

In same time, efforts been taken for expedites patent application and also offers lots of incentives had attracts more and more industries and also universities in protecting and utilizing patent. Statistic of Patent Application as indicator of implementation of Japan IP Strategy Program as follows;



**Changes in the Number of Patent Applications**



**Changes in the Number of PCT Applications**

JPO had commissioned National Center for Industrial Property Information and Training (INPIT) to support National IP Strategy Program. The INPIT, an Independent Administrative Institution, was established on April 1, 2001. The center provides comprehensive information on industrial property. These include gathering and reading official gazettes on industrial property; providing consultations on industrial property; gathering and reading the Japan Patent Office's industrial property reference materials; and utilizing licensable patents. In October 2004, INPIT, previously named as the National Center for Industrial Property Information started providing "information dissemination services" and "human resource development services." The Industrial Property Digital Library (IPDL) offers the public access to IP Gazettes of the JPO free of charge through the Internet.

In achievements for more utilizing of patent and innovation, program had been made in encouraging patent licensing through use of human resources and other means. Experts who help support the promotion of patent licensing (Patent Licensing Advisors) are dispatched to mediate, offer consultations, and provide training and educational programs on patent licensing and technology transfers. To increase the recognition of measures for encouraging patent licensing, moreover, the Department holds comprehensive seminars on these business operations, called "Seminar for Encouraging Patent Licensing", in various parts of Japan.

Another program that supports implementation of IP Strategy program is encouraging the provision and use of information on licensable patents. The INPIT having department offers ideas on how licensable patents may be used. This is conducted through provision of information on licensable patents included in the patent licensing database, and through Examples of Licensable Patent Utilization. Its' provides Charts for Supporting Patent Licensing that analyze the trends of domestic patents and corporations. Companies hoping to create new businesses will find these charts useful as an index for introducing and transferring technologies. Additional of this program, INPIT had introduces and dispatches specialists on patent information research (Patent Information Advisor) to help small and venture businesses in the regional community develop technologies and introduce patents by using patent information.

The INPIT also involves in dissemination and promoting IP and its relations to business needs in fostering of patent licensing business by organizing training programs, holding international seminars, and carrying out other activities includes fostering individuals who will play central roles in the patent licensing market in the future. At the same time, it publicizes a list of patent licensing agent to make this business better known in Japan, and to provide opportunities for the public to access the business agents.

Other independent agency that working closed with JPO and initiating more activities in innovation and intellectual property utilization is Japan Institute of Invention and Innovation (JIII). The JIII was originally established under the name of "Association for the Protection of Industrial Property" on May 5, 1904, with the basic aim of developing and safeguarding industrial property. In 1906, the Association was reorganized as a Corporate Juridical Person in order to solidify its foundation and expand its activity for promoting inventiveness, and in 1910, it was renamed "Imperial Institute of Invention and Innovation." In 1936, this institute was reorganized by unifying invention-encouraging organizations and since then, the institute has been promoting activities for inventiveness by utilizing a nation-wide system as its largest organization for the encouragement of inventiveness. In 1947, the institute was renamed as Japan Institute of Invention and Innovation.

The objectives of the JIII are to encourage invention, enhance original ideas, promote the practical use of them, and diffuse and develop the industrial property system, thus advancing science and technology and contributing to the development of economy of Japan. Principal activities undertaken by JIII through its branch offices in 47 prefectures<sup>9</sup>.

Branch of JIII that directly involved in disseminating intellectual property and also give assistance to private in advising patent system for domestic and foreign application is Asia-Pacific Industrial Property Centre (APIC). The Asia-Pacific Industrial Property Centre (APIC) was established within the JIII in 1996 with the aim of supporting the growth of human resources in intellectual property fields within developing countries in the Asia-Pacific region. Its activities are commissioned by JPO and gets cooperation and support from the World Intellectual Property Organisation (WIPO), the Association for Overseas Technical Scholarship (AOTS), the Japan International Cooperative Agency (JICA) and other related organization.

The APIC conducts training programs on intellectual property targeting the nations receiving governmental overseas development assistance (ODA) to Japan from the Asia-Pacific region. The training courses designed by APIC are targeted for managers and operational staff involved in the establishment, application and diffusion of intellectual property system such as government officials, corporate and law firms' employees, research institutions scholars and other professionals. The training seminars and lectures are arranged by inviting top professionals from various fields including academia, legal circles and business from overseas and Japan. The training courses offered by APIC on intellectual property system are based in the global perspective and directly linked to practical activities.

Beside lectures in the classroom, the trainees are also provided on-site training on electronic application systems in JPO, industrial property rights information service in INPIT, judicial proceedings in intellectual property, administration of intellectual property in industry etc.

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<sup>9</sup> <http://www.jiii.or.jp/english/jiiiprofile-e.htm>



As a part of its training activity, APIC has developed a variety of texts in various specialized fields of intellectual property rights. These texts are available in English as well as in Chinese, Vietnamese, Thai and Indonesian languages. The text in English is accessible through the internet from the website of APIC. These texts are used for dissemination of IP information as well as in the training courses and other activities. Besides these, APIC has also created English language DVDs to provide information on intellectual property system from the basics to specialized fields in an easy-to-understand way. APIC also arranges overseas IPR Seminars as follow up for its training course alumni in their own countries. These seminars are sponsored by the JPO and organized by respective local governmental organizations related to intellectual property. In FY 2007, such IPR Seminars were held in Vietnam, Philippines, Thailand, China, India, Indonesia and Malaysia.

The Japanese government recognized the key role of IP professionals as it's includes in National IP Strategies Program. International Association for the Protection of Intellectual Property of Japan (AIPPI-Japan) is one of IP practitioners association that indirectly contributes to IP Strategy Program<sup>10</sup>. The Japanese Group of International Association for the Protection of Industrial Property (AIPPI) was established on April 27, 1956 based on the strong recommendations of the then Commissioner of the JPO, who highly appreciated the activities of AIPPI for internationalization of industrial property rights. In the same year the Japanese Group was formally admitted into AIPPI at its Congress held in Washington. In 1991, the Japanese Group of AIPPI was incorporated as the International Association for the Protection of Industrial Property of Japan. In its Congress held in June 2001 its name was changed to International Association for the Protection of Intellectual Property of Japan (AIPPI Japan) with the approval of the Minister of Economy, Trade and Industry. Since then it has developed to become the world's largest national group with more than 1,111 members (as of March 2007) and is involved in a wide range of activities to improve the intellectual property system in Japan by working closely with national groups, intellectual property offices and intellectual property-related organizations of major countries.

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<sup>10</sup> [http://www.aippi.or.jp/english/info\\_e\\_200.htm](http://www.aippi.or.jp/english/info_e_200.htm)

The AIPPI Japan had participates in the activities of the Committees organized by AIPPI Headquarter to discuss and conduct research on IP related Treaties and Conventions and overseas Laws and Regulations. The various issues on which discussions and research has been made, *inter-alia*, include Limitations of the Trademark Protection, Impact of Co-Ownership of Intellectual Property Rights on their Exploitation, GATT/WTO (Doha Declaration), Patent Cooperation Treaty (PCT), Substantive Patent Law Treaty, Scope of Patent Protection etc. The details of the discussions are published in the AIPPI Journal as and when the need arises.

The AIPPI Japan also conducts investigative research on IP system of foreign countries to ascertain the current situation and trends of the world, as well as to establish policies for future directions. It has collected and translated foreign IP laws and regulations of 59 countries, regions and organizations, and has also uploaded the textual data of 53 countries, regions and organizations, after getting necessary approval from them, on the JPO's website under a project entitled "The Program for Cooperation in Establishment of Information on Foreign Industrial Property Systems" commissioned by the JPO.

The AIPPI Japan also published a monthly magazine in Japanese which contains expert analysis of IP related issues and information on legal revisions and practices of laws and regulations of various countries. It also publishes a Bi-monthly Journal in English containing analysis of IP, court decisions, laws and regulations in Japan and other countries. In addition to this, it also publishes various books and reference materials concerning overseas intellectual property-related laws and regulations and court decisions, for its members. Foregoing of this activities, the AIPPI Japan had supported in national IP strategy in strengthen IP professional to provides advisory and consultation services for patent holder to protect theirs IPRs.

Another association that provides resources for IP consultant and upheld patent Japan patent systems is The Japan Patent Attorneys Association (JPAA) that governing organization of Patent attorneys in Japan. It was originally established in 1915 and was made an official organization by promulgating the Patent Attorney Law in 1921. By partially amending the Patent Attorney Law in 1938, it was made

mandatory for all practicing patent attorneys to become a member of the Patent Attorneys Association.

The main responsibilities of JPAA are to maintain high standards of conduct and professionalism of patent attorneys and contribute to the general growth of the profession. These responsibilities are met through the exercise of guidance to members by promoting communication among them. It supervises a large number of committees specializing in IP issues of practical interest. Through its varied activities, it contributes to the development of IP system by particularly laying emphasis on the improvement IP laws and related legal regulation and practices involved. It works in close cooperation with METI and JPO by making positive proposals to the advancement of IP system and provides related information and comments to the inquiries.

JPAA has another affiliated organization, namely, Central Research Institute of Intellectual Property which was established in 1996 to undertake research on issues concerning intellectual property and patent attorneys and to provide information thereon with the objective to contribute to the sound development of the intellectual property system and the patent attorney system. The institute not only conducts research into domestic and foreign issues concerning intellectual property and patent attorney activities from a long-term and international perspective but also by performs services in connection therewith

Organizations' that mentioned as above only partly of whole organization in Japan that involves in action plans listed in the national intellectual property strategies annual program which involves into five areas:(1) creation, (2) protection, (3) exploitation, (4) media contents protection, and (5) human resources. All this efforts is Japanese Model that had shown achievement and year end of 2011 will give results of this national intellectual property nation based program.

## **CHAPTER III – Study on the technology transfer activities in Universities in Japan**

### **Introduction**

One of the National Strategy of Intellectual Property is included the importance of Universities and Research Institution role in empowering the Japan economy. The term “intellectual property” is closed relation to intellectual of human being minds. Source of intellect person is created from educational centre or research centre that working environment generates a new idea of solving human being problem. This concludes needs and importance of universities to gather and involved in improving nation economy.

From an economic perspective, intellectual property to which a monetary value can be attached is considered more valuable. Most the intellectual property rights protected by laws, including patent rights, fall into this category. However, property that cannot be judged in terms of monetary value, including knowledge and wisdom, is also intellectual property. In other words, everyone owns their own “intellect,” which could be described in a sense as property, and it can also be said that “intellectual property is the researcher’s weapon.” Such findings from research and development are importance to creation of business activities. This creation shall being transfer to industries as utilization of research findings which it gives means of purposes in research and development activities. However, as this public institution not business oriented, issue of transfer technology which involved “monetary” aspect has to be addressed in proper manner. This is to ensure benefited from technology transfer is not cause any waste of resources and its economy cycle will generate more fund to research sector that continue economy revolving through technology transfer activities.

### **Overview of Japanese Public Universities in Japan involves in Research and Development**

Idea of Japan universities to get involved in technology transfer had been introduced before the announcement of national intellectual property strategy program. The Basic Plan for Science and Technology, adopted by the Cabinet in 1996 stressed the

importance of promoting collaboration between universities and business. However, the legal framework of industry academia and governmental collaboration was established with the 1998 Law Promoting Technology Transfer from Universities to Industry which was followed by the Law on Special Measures for Industrial Revitalization made in 1999. These laws made intellectual properties obtained through research and development supported by government funding, belong to researchers, thus promoting technology transfers based on TLOs. The Law on Special Measures for Industrial Revitalization is called the Japanese version of the Bayh-Dole Act.

The IP policy outline regarded technology transfer as an important vehicle to drive the revitalization of Japanese economy and set forth specific arrangements for efficient and smooth university-industry collaboration. The Basic Law of Intellectual Property enacted to implement the intellectual property policy outline, *inter-alia*, stipulated the social contribution of the universities through disseminating research results in Article 7 (1) which states “universities, etc. shall in light of the fact that their activities are contributing to the creation of intellectual property throughout society..”

What does intellectual property mean for researchers who work on the creation of new knowledge? Article 2 of the Intellectual Property Basic Act defines the terms “intellectual property” and “intellectual property right” as follows:

*The term “intellectual property” ... shall mean inventions, devices, new varieties of plants, designs, works and other property that is produced through creative activities by human beings (including discovered or solved laws of nature or natural phenomena that are industrially applicable), trademarks, trade names and other marks that are used to indicate goods or services in business activities, and trade secrets and other technical or business information that is useful for business activities.*

*The term “intellectual property right” ... shall mean a patent right, a utility model right, a plant breeder’s right, a design right, a copyright, a trademark right, a right that is stipulated by laws and regulations on*



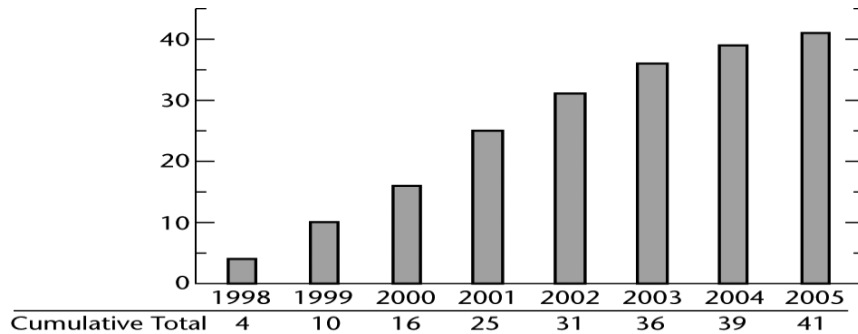
*other intellectual property or right pertaining to an interest that is protected by acts.*

Based on the policy outline and definition of intellectual property, it gives such effects to the universities to getting involved in implementing national strategy on nation built on intellectual property. Nevertheless, the research function in universities research activities not mean business but on creation and rolling of intellectual minds amongst the universities staff which to empowering supply for needs of for future employment expertise for students in science and technology related area. The changed of expectation which creates benefited for students and industries in one research activities helps creation of future expertise and also assists industries with new findings in same time.

The Technology Licensing Office (TLO) Act was passed in 1998 in establishing technology transfer system using universities and other public research institutions. Since the TLO Law in Japan was established jointly by METI and Ministry of Education, Culture, Sports, Science and Technology (MEXT), the proposals of the universities for establishment of TLOs are jointly reviewed and approved by METI and MEXT. METI provided financial support for an initial period of five years for their establishment and for some of them, this support has been finished and they are in independent operation. The TLOs in Japan can be broadly divided into three categories depending on their nature:

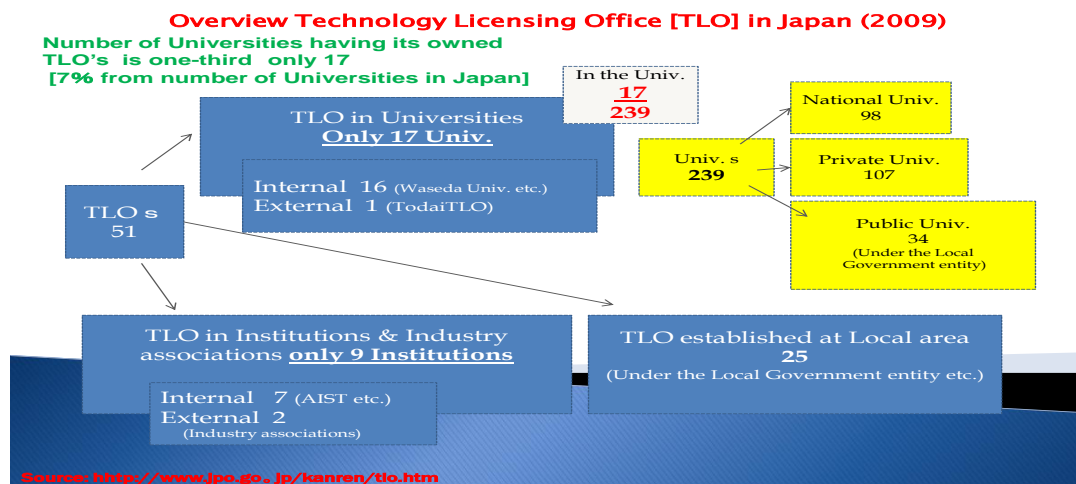
- (1) Internal TLO** : These TLOs are established within universities and are part of University without any legal status;
- (2) External TLO** : These TLOs are established outside the universities. They function separately from the University and have independent legal status. They deal with only one particular university; and
- (3) Area TLO** : They are established outside of universities, but they deal broadly with two or more universities.

By the year 2005, 43 TLOs were established in Japan since the TLO law was passed in 1998. These TLO's are representing nearly all research universities. The growth of TLO's from 1998 to 2005 can be described by the following graph.



(Source: Promoting University-Industry Linkages in Japan: Faculty Responses to a Changing Policy Environment, Prometheus, Vol. 26, No. 1, March 2008)

The Number of TLOs has since reached to 46 after operation plan of the 46<sup>th</sup> TLO has been approved jointly by MEXT and METI on 31<sup>st</sup> March, 2008<sup>11</sup>. Current status of TLO is shown as follows;



When the first TLOs appeared, the national universities were not independent entities. As such profit-making TLOs were not allowed to reside in the campuses of national universities. However, it was possible at that time for the TLOs to reside in the private university campuses. Therefore, many TLOs were established outside of universities as independent entities. For example, the Waseda University, which is a leading private university in Japan, established its Intellectual Property Center which

<sup>11</sup> [http://www.meti.go.jp/english/press/data/nBackIssue20080401\\_01.html](http://www.meti.go.jp/english/press/data/nBackIssue20080401_01.html)

was jointly approved by METI and MEXT in April 1999. Based on the Law for Promoting University-Industry Technology Transfers, the intellectual property center was designated as TLO and incorporated into the university. The typical work activities of the TLO of Waseda University are as under<sup>12</sup>:

- (i) Patent Acquisition:
  - Offering consultation to inventors;
  - Invention discovering, prior art search, market survey and technical evaluation; and
  - Patent application, maintenance and management.
  
- (ii) Technology Transfer:
  - Promoting industry-academy cooperation;
  - Total support for business agreement negotiations through conclusion.
  - Documentation supporting terms of contract documentation, verification and Management; and
  - Supervision over royalty payments.
  
- (iii) Industrial-Academic Collaboration:
  - Organization of Technology Transfer Meetings;
  - Secretarial support for government grant applications, progress management and audit preparations;
  - Representing other universities lacking TLO in technology transfer transactions.

In support for operation of TLO in universities, effort had being made by various government agencies such as JPO, INPIT, JIII and others. The said program had shown good respond in implementing universities as sources of creation in intellectual property cycle. Also not to mentioned in term of protection and utilization. Various support are includes as follows;

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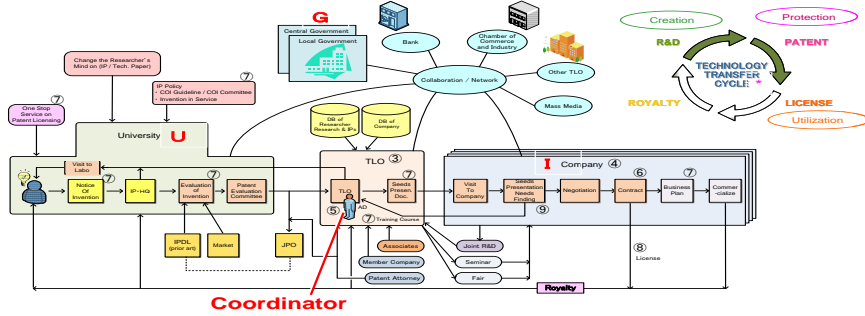
<sup>12</sup> [http://tlo.wul.waseda.ac.jp/APPLICATION/WRCPC\\_english.pdf](http://tlo.wul.waseda.ac.jp/APPLICATION/WRCPC_english.pdf)

- i. Dispatch of University Intellectual Property Advisors / Dispatching of patent Licensing Advisors
- ii. Holding of seminars for university researchers to provide information about strategic filing of applications, acquisition of rights and utilization of rights by making use of search results and also to use patents information in R&D activities.
- iii. Free Access to Patent Licensing Database: INPIT provides free access to the database of licensable patents owned by universities and other research institutes via the internet.
- iv. Accelerated examination of patent applications filed by universities / TLOs by JPO on submission of a written request elaborating such need to facilitate early commercialization of the research results of the universities through early acquisition of rights.
- v. Reduction/exemption of payment of examination request fee and patent annual fee by JPO based on the provisions made in the Law for Promotion of University-Industry Technology Transfer (TLO Law), Law on Special Measures for Industrial Revitalization and the Law for Enhancing Industrial Technology.
- vi. Exemption from the lack of novelty in patent applications filed by universities designated as academic groups by Commissioner of JPO: Based on Article 30 of the Patents Act

The operational and management of TLO in Japanese Model is in systematic manner which had been improved from time to time. Assistant offered by Patent Licensing Advisor not only in matter of intellectual property management but extends to matching between universities and industries. This management of intellectual property cycle from idea to commercialization can be shown as below;

## OVERVIEW ON FUNCTION AND OPERATION OF TECHNOLOGY LICENSING OFFICE (TLO)

"Coordinator Training for Tertiary U-I-G Link to Develop Local Industry Sector"  
 ● Ultimate Goal : "Encouraging IP Innovation Cycle" through U-I-G Collaboration"

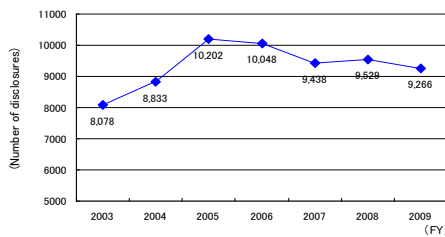


● To Circulate "IP Innovation Cycle", First Success of License is essential ● Creation, Protection & Utilization of IP  
 Courtesy Hidekatsu KASHIWARA, Senior Consultant, Technology research Development, Chiyoda U-Tech Co. Ltd.

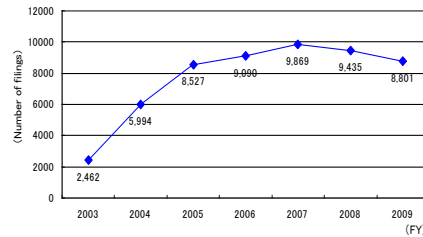
Over and above all this initiative, results shown program under intellectual property strategy has achieved success as shown as below;

### Invention Disclosures & Patent Rights

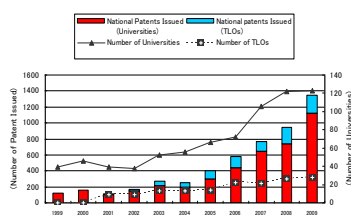
**Invention Disclosures (all universities etc.)**



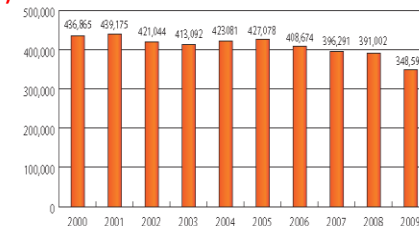
**Patent Applications Filed (All universities etc.)**



**Patent Applications Issued (all universities & TLOs)**



**Patent Applications in Japan**



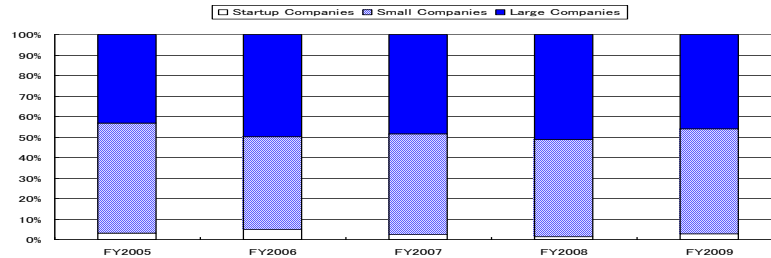
**The sum of Patent Applications issued to universities & TLOs increased 43% from 944 to 1,347 in FY2009**

Sources : Survey Report University Technology Transfer Association

In terms of measuring success of TLO activities in utilization of patent through technology transfer activities has been shown as follows;

## Licensing Activity

Type of Licensee

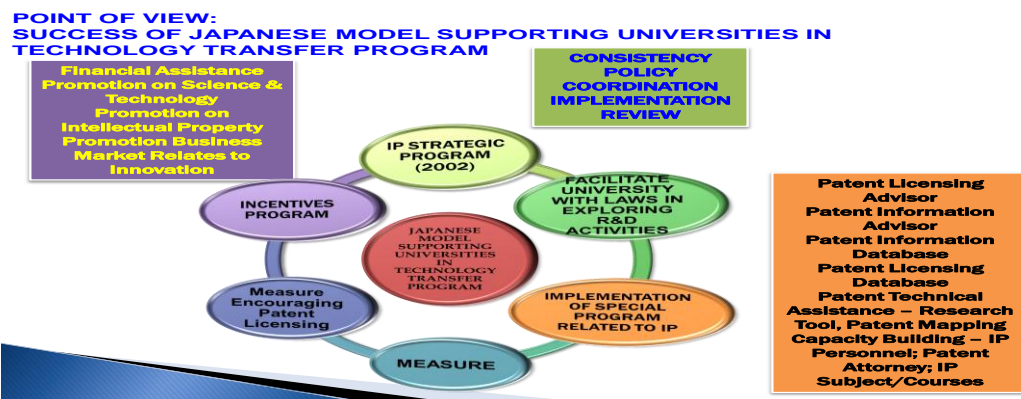


Key indices of University Technology Transfer in Japan (FY2005 ~2009)

Japan	Total Research Expenditure	Number of Invention Disclosures	Patent Applications Filed /Invention Disclosures	Number of Patent Applications Filed (Domestic)	Number of New Licenses	Number of Current and Active Licenses	Adjusted License Income	Number of Startup Companies Formed	The sum of staffing
FY2009 83 respondents	¥2,289 billion	9,266	73.4%	6,799	1,683	5,039	¥1.62 billion	28	1,549.68
FY2008 87 respondents	¥2,178 billion	9,529	73.3%	6,980	1,319	3,526	¥1.37 billion	19	1,198.86
FY2007 71 respondents	¥2,160 billion	9,438	72.9%	6,882	1,367	4,820	¥1.21 billion	21	1,216.56
FY2006 74 respondents	¥2,126 billion	10,048	72.5%	7,282	1,128	3,694	¥1.36 billion	35	1,168.19
FY2005 89 respondents	¥2,153 billion	10,202	70.5%	7,197	1,056	2,731	¥1.07 billion	46	1,008.39
	*Japan total	*Japan total	*Japan total						

Sources : Survey Report University Technology Transfer Association

It can be concluded, universities research activities under the Japanese Model had achieved the objective and purpose of national intellectual property strategy program. It is not to measure objectively on value of licensing but the spirit of needs in technology transfer from universities to industry is more important. In other words, the research funding that is invest in research and development activities is paid for and industries get benefit from this activities.






## **CHAPTER IV – Point of View: Experienced from Japanese Model in developing U-I-G Linked for Malaysian innovation/Intellectual Property Based Nation**

### **Introduction**

In late 1990's, Government of Malaysia had promoting importance of knowledge based economy as paradigm changed to achieved Malaysia vision 2020 as developed country. This movement also as respond to world scenario of economy trends as borderless business transaction. This economy trends made businesses more competitive and involves technology advancement in bringing better consumer products and also to supply business needs in operating and managing human life in this twenty centuries era.

Malaysia government had acknowledged importance of technology and innovation as the one of primer driver of economic growth. In assistance of this promotion, lots of policy in relation of science, technology and innovation were put in place to show interest of Malaysian government. Year 2010 is declared as year of innovation

named as 1Malaysia Innovative 2010 (1M2010)  on 27 January 2010. The Prime Minister in his speech states that *“Creating a high income nation will mean higher wages throughout the economy as growth is derived not only from capital, but from greater productivity through the use of skills and innovation, improved coordination, stronger branding and compliance with international standards and Intellectual Property Rights. In a knowledge economy, investment in new technology, multi skills, innovation and creativity, and increased competency are the drivers of public and private sector performance”*<sup>13</sup>.

Encouragement for Malaysian public institutions not only having more research and development activities but extended to involved into intellectual property systems which its involved patent application and patent commercialisation had put in place in

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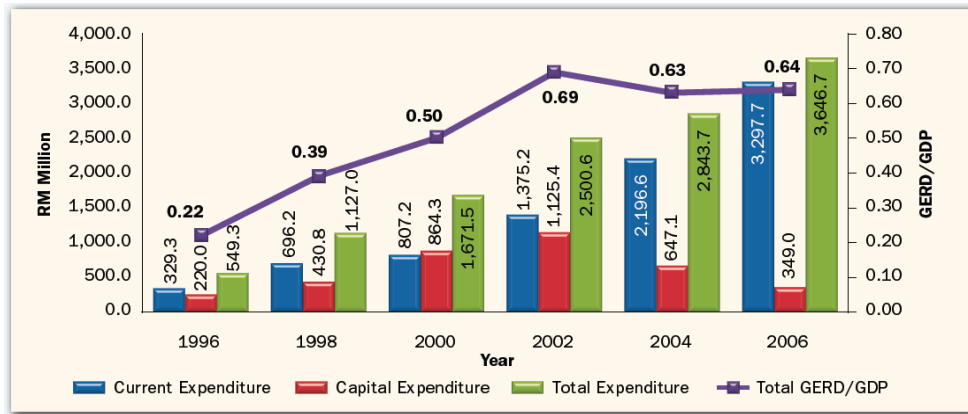
<sup>13</sup> Dato' Sri Mohd Najib Bin Tun Haji Abdul Razak, Prime Minister of Malaysia; Shangri-La Hotel, Kuala Lumpur, 30/03/2010, Invest Malaysia 2010.

early 2000. Respond from Malaysia Universities are positive and slowly increasing their interest in intellectual property systems and also commercialisation aspects.

### **Malaysia Research and Development Activities Overview on**

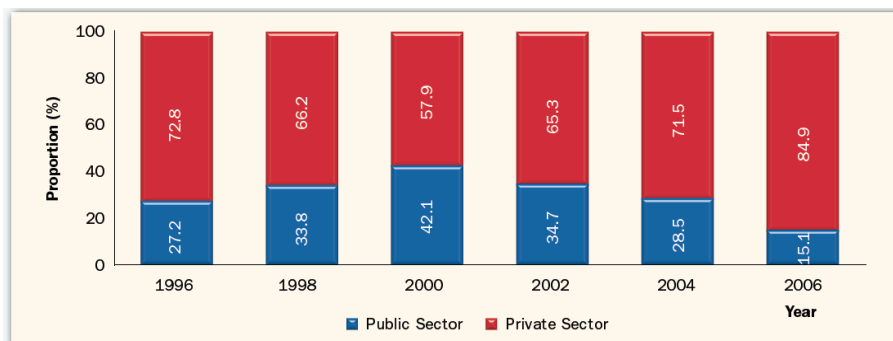
Research fund that provided by Government of Malaysia for 10<sup>th</sup> Malaysia Plan in particular for year 2011 to 2012 is RM741 million. This fund to support research of area of fundamental research grant, exploratory research grant scheme, long term research grant, prototype development research grant scheme and research incentives. Malaysia's emphasis on the importance of R&D and innovations in the process of economic and social development can be witnessed in the formulation of the Knowledge-Based (K-Based) Economy Master Plan. In the K-based economy model, a high proportion of the GDP is expected to be derived from knowledge-based and knowledge-enabling industries such as high and medium technology industries. K-based economies are also characterized by high investment in R&D, good technology related capacity and skills, and strength in innovation. Develop a knowledge-based economy; an economy based on the production, utilization and distribution of knowledge, which are the primary factors in the growth and wealth creation of the economy.

For purpose of this chapter, the researcher will refer The 2008 Report on the National Survey of Research & Development, MOSTI, Malaysia as a benchmark for discussion. Type of research that governs in Malaysia includes basic research; applied research and experimental research. Malaysia's gross expenditure on R&D (GERD) in 1996 was RM549.2 million. Since then, it has been rising steadily. It surpassed the RM 2 billion mark in 2004, and continued to rise in 2006, with an expenditure of RM3.6 billion.



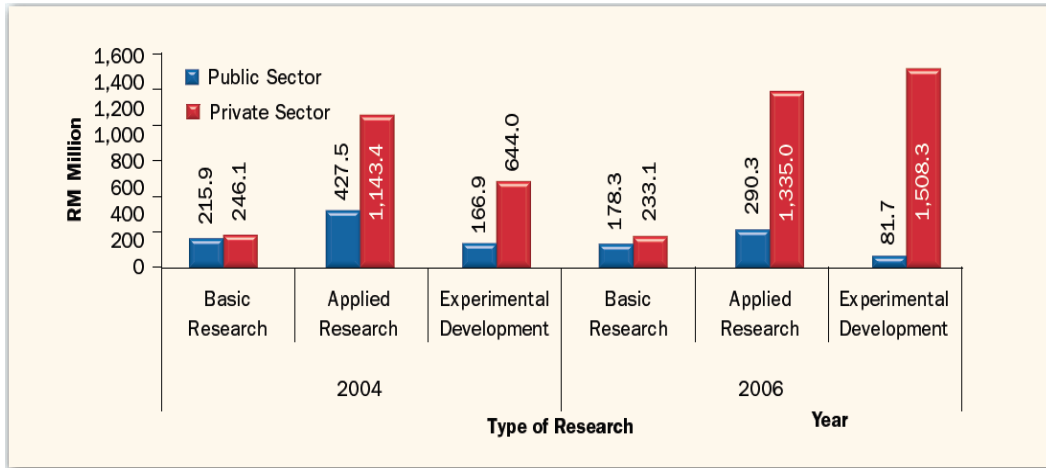
**Research and Development by Expenditure**

The public sector accounted for 15.1% of the GERD and the private sector accounted for 84.9%. From the public sector, the GRIs and IHLs accounted for 5.2% and 9.9% of the total expenditure respectively. The private sector remains the major contributor to the GERD during the 10 year period, accounting for more than three quarters of the expenditure.



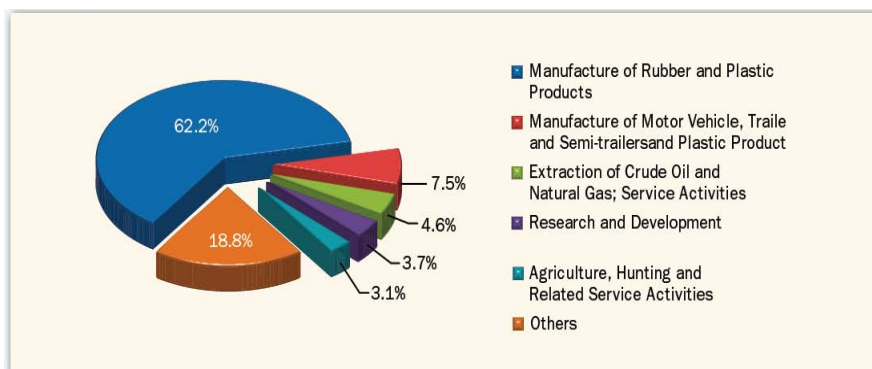
**Research and Development Expenditure by Sector**

In 2006, the private sector spent RM1.5 billion on experimental development research, an increase, in nominal terms, of RM864.3 million from 2004; RM1.3 billion on applied research, an increase of RM211.6 million from 2004, and RM233.1 million on basic research. In the public sector, expenditure decreased, in nominal terms, in basic, applied, and experimental research when compared to 2004. In 2006, the public sector spent the most on applied research (RM290.3million), followed by basic research (RM178.3 million), and experimental research (RM81.7 million)



**Expenditure by Type of Research**

The private sector remains the major contributor to the GERD during the 10 year period. The private sector accounted for 84.9% and the public sector accounted for 15.1% of the GERD. Area of research for private sector is reflecting the government effort in economy reform from agriculture based to industrial based. Basically, Malaysia is agriculture based nation then moving to industrial based nation; R&D spending in this type of industries are more which shown in 2006 R&D in the rubber and plastic products manufacturing industry accounted for 62.2% (RM1.9 billion) of the private R&D expenditure. Follow by manufacturing of motor vehicles, trailers & semitrailers industry with a spending of RM233.5 million (7.5%). Extraction of crude oil & natural gas and service activities constituting 4.6% (RM143.7 million) is the third place.

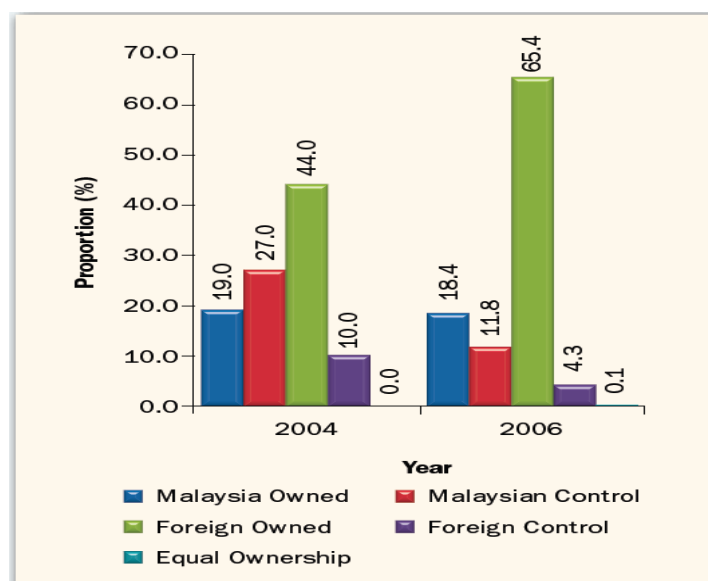


**R&D Expenditure by Major Industries 2006**

The largest amount of R&D expenditure was with foreign owned companies. However, there is a shift in the amount spent by Malaysian-owned and Malaysian-controlled companies. In 2004, Malaysian-controlled companies charted a higher R&D spending compared to Malaysian-owned companies. This pattern is reversed in 2006, where Malaysian-owned companies recorded a higher R&D spending. The proportion of R&D expenditure for foreign controlled companies indicated a decrease from 10% in 2004 to 4.3% in 2006.

Category of Company Revenue	(RM Million)	(%)
Below RM10 Million	301.6	9.7
RM10 - RM100 Million	2,147.6	69.4
Above RM100 million	647.2	20.9
Total	3,096.4	100.0

R&D Expenditure by Category of Company Revenue 2006

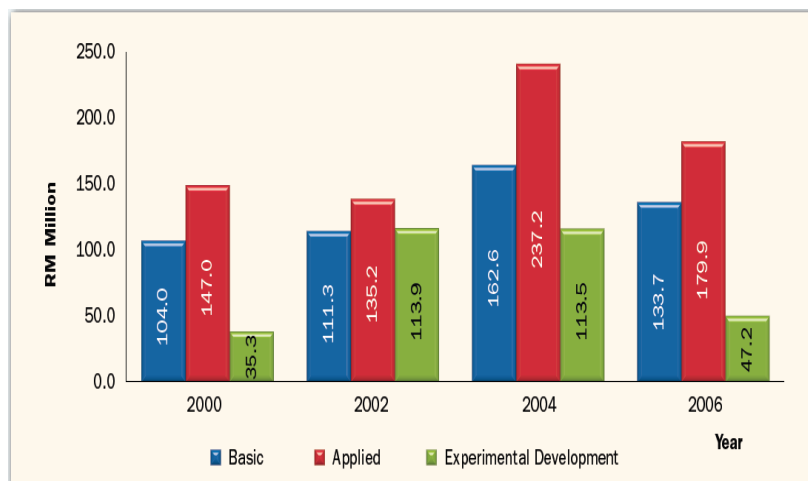


Proportion of GERD by Ownership of Companies (2004 and 2006)

## Overview on Malaysian Public Universities in technology transfer

In supporting and encouraging research and development activities, besides funds allocated for universities, there are also policies that promulgated to provides outlines and intention of Malaysia government. The Malaysia government recently, launched policy that allows Malaysian Universities to explore and utilize research activities to involve in technology transfer. The policy is named as Intellectual Property Commercialization Policy. The objectives of this policy are to establish a common framework to regulate the ownership and management of Intellectual Property from the creation, protection, innovation, exploitation and technology transfer activities carried out by the Relevant Body; to promote and facilitate the protection of Intellectual Property in line with the National Intellectual Property Policy; and to promote and facilitate the exploitation and commercialisation of Intellectual Property generated from projects funded by the Government of Malaysia.

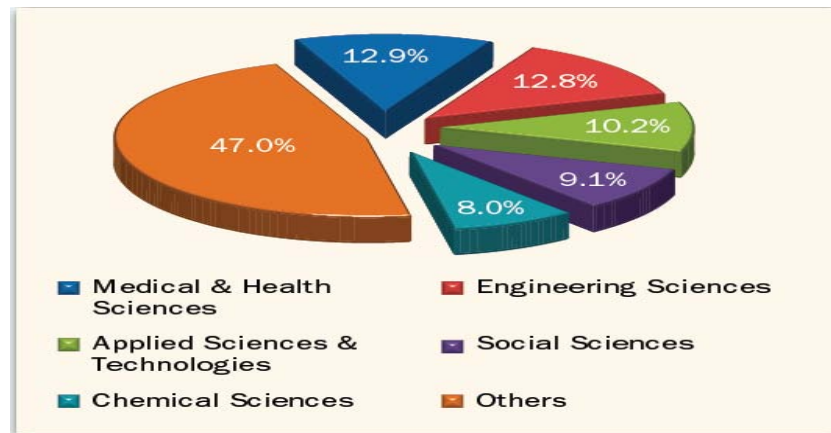
In 2006, expenditure by type of research for universities was spent on Applied Research (RM179.9 million). This was followed by Basic Research (RM133.7 million) and Experimental Development Research (RM47.2 million).



Expenditure by Type of Research

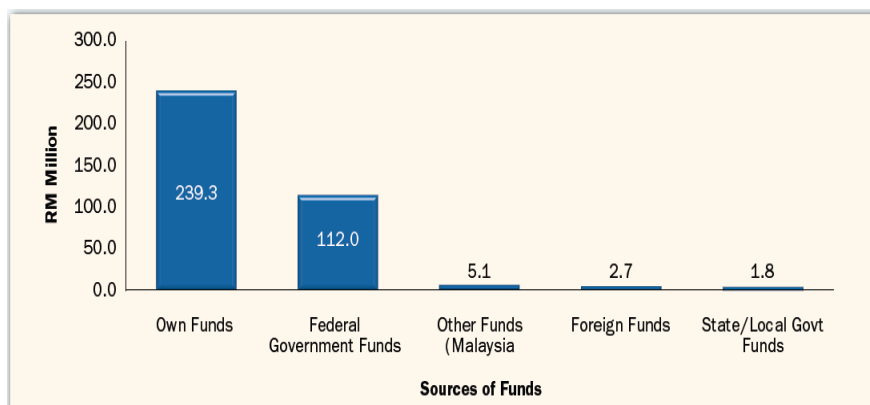


The top five Field of Research expenditure for 2006 were Medical and Health Sciences (12.9%); Engineering Sciences (12.8%); Applied Sciences & Technology (10.2%); Social Sciences (9.1%) and Chemical Sciences (8.0%).



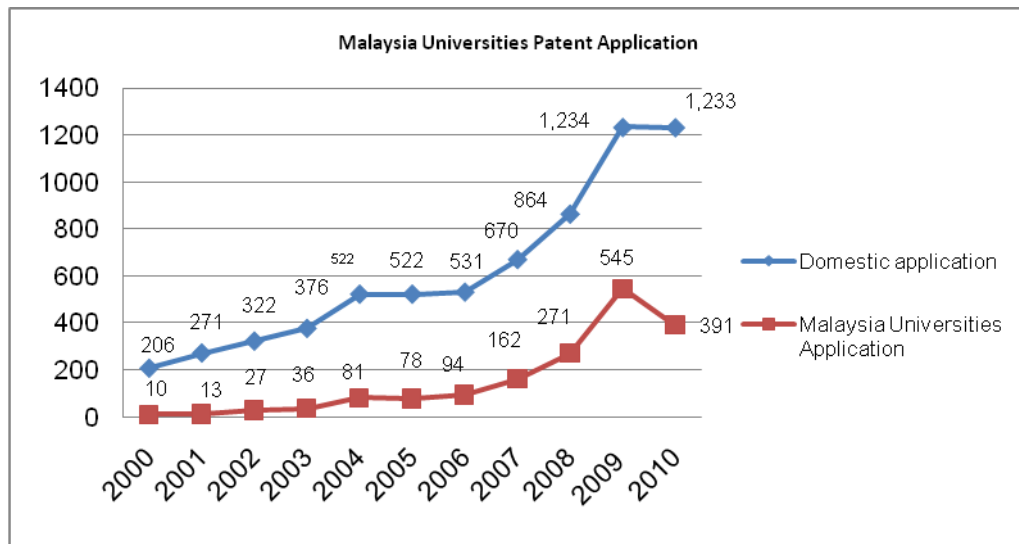
Expenditure by Field of Research

In 2006, Universities relied on their own funds as main source amounting to RM239.3 million (66.3%). Federal Government Funds fall second, with RM112.0 million (31.1%). Other sources of funds were Other Funds in Malaysia (RM5.1 million), Foreign Funds (RM2.7 million) and State/local Government Funds (RM1.8 million)



Sources of Funds in 2006

Despite of all efforts be put in encouraging on research and development, Malaysian Universities had gradually put effort in patent application especially from year 2003 whereby the number of patent application is starting up ward. This is reflects to government initiatives in encouraging patent protection in Malaysian Universities.



The researcher had gone through all 20 Malaysian websites in order to find out transfer technology activities and management of patent and innovation activities in those universities. In general, most of Malaysian Universities having centre for innovation and managing patent application. This centre be named in different names and in few universities has more than one centre for coordination innovation activities in university. These centres can be concluded as Intellectual Property Management Office (IPMO). Some of this centre has established TLO as under IPMO management. However, in term of measures for utilization from technology transfer are not disclosed in that website. However, some of those websites states initiative and invitation for licensing on theirs patent and invention activities.

## **CHAPTER VI – Concluding Remarks: Lesson Learned - A Way Forward**

### **Introduction**

This chapter is concern with the researcher findings of Japanese Model in implementing technology transfer Japan Universities which one of the Japan Government in pushing economy growth and in relation to plan of action of intellectual property strategy program which plan in year 2002. The researcher had experienced through his study and research by interview parties involved in this technology transfer process and its very helpful in understand the Japanese Model.

The researcher also liked to share his experience by putting such recommendation which based on his past experienced as project coordinator/trainers in public awareness on intellectual property activities program from year 2000 to 2005 which inspired for him to study Japanese Model in technology transfer activities. The researcher interest is continually especially in intellectual property management, understanding involvement of intellectual property systems in business cycle/activities which this continuity process not excluded technology transfer management process.

### **Lesson Learned - A Way Forward**

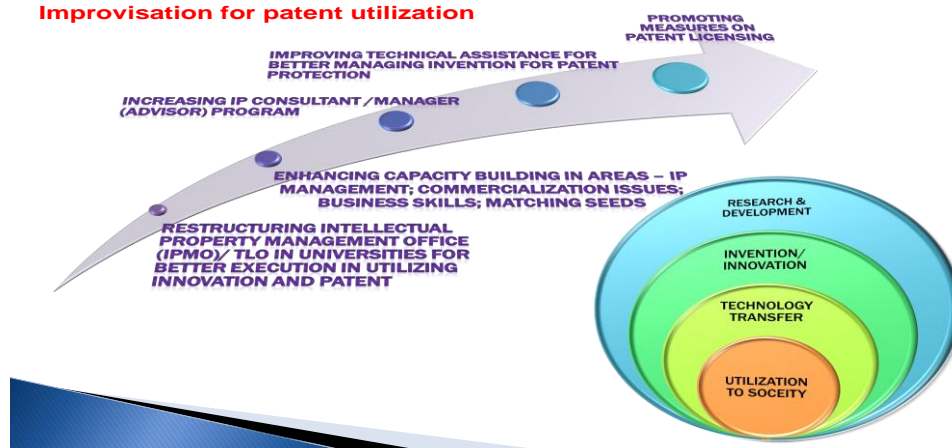
It is government interest in innovation and commercialization aspect in spinning the Malaysia economic. This statement based by science and technology related policies, number of research funds being allocated and also in meeting Vision 2020 as Malaysia becoming develop country as it should be having innovation nation based element.

In general, Malaysia had all elements of innovation nation based element. By reference to Japanese Model, even though Japan had been acknowledged as technology nation, but it is quite surprising, policy on intellectual property nation based is clearly stated in year 2002. The researcher point of view, this policy is to invite people of Japan to put all innovation and technologies knowledge in proper manner and should be measure as success of contribution to economy growth in

facing challenges to current international competition and standardized in current world economy trend.

The Malaysian Universities has lots of room to improvise in its management of utilization of patent to transfer its technology knowledge and research findings to industries and society. It is likes managing a library, whereby a good librarian will managed its books by proper indexing and arrange accordingly as gives benefit for reader to find any of reader's intention to having his reference books. It is also same approach, whereby when Universities has lots of intellectual capital should be managed in better manner from knowledge of intellectual property, business skill until success of business in industries which received technology transfer from universities.

**Lesson Learned:  
Improvisation for patent utilization**



- i. Restructuring Intellectual Property Management Office (IPMO)/ TLO in Universities for better execution in utilizing innovation and patent
- ii. Enhancing Capacity Building in Areas – IP Management; Commercialization Issues; Business Skills; Matching Seeds
- iii. Increasing IP Consultant /Manager (Advisor) Program
- iv. Improving Technical Assistance for better managing invention for patent protection
- v. Promoting Measures on Patent Licensing