THAILAND'S EXPERIENCE IN FOSTERING UNIVERSITY-INDUSTRY PARTNERSHIPS

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ABSTRACT

This paper reports and focuses on Thailand's University – Industry partnership and their activities, especially in Intellectual Property (IP) assets. It has been found that, in fostering University – Industry partnerships, the effective management as well as the appropriate Government's support are both very significant. A special partnership organization to promote better IP asset outcome is also introduced here.

INTRODUCTION

Thailand is a developing country of 513,115 square kilometers located in South-East Asia, with Myanmar, Laos, Cambodia, and Malaysia as her neighbors. The current number of population reaches 65 millions in 2004 with an average income of 4,237 baht per person per month (approximation: 1 U.S. dollar ≈ 40 baht, THB). Almost 80% of the populations are occupied in the agricultural sectors, with 0.015 % are in the Government sectors, and others are in the industry. It is reported that 1,311,201 MTHB of the country's revenues are from the industry compared to 351,512 MTHB earning from agricultural products. Since Thailand is not yet an industrialized country, there are more IP assets to develop in The Agricultural Industry which is most matches with her population's root of nature.

IP ASSETS

IP (Intellectual Property) in Thailand is divided into:

A. Industrial property
B. Copyright

A. Industrial property consists of Patents, Trademarks, Trade Secrets, Trade Names, Layout–Designs of Integrated Circuit, and Geographical Indications.

Patent protects "invention", "Product Design", and "Utility Model". One can apply for "Petty Patent" which has the lower steps of work accomplished requirement compared to "Patent". It needs quicker time and shorter procedures to be granted (at a lower fee). No "Petty patent" can be granted for "Patent" again.

Trademarks concern all products that need "Trade Mark", "Service Mark", "Collective Mark" and "Certification Mark". These are quite known as "Logo's".

B. Copyright covers creation work on literatures, arts, music, movies, and other creation in sciences. The copyright includes "Neighboring Right", "Computer Program" (software) and "Data Base".

IP assets to be discussed in this paper mainly describe the utilizations of both "Industrial Property" and "Copyright" as well. The Department of Intellectual Property (DIP) of the Ministry of Commerce, in October 2003, had signed Memorandum of Understanding (MOU) with SME Bank and Industrial Finance Corporation of Thailand (IFCT), the leading creditors for industry, to accept IP Assets as the investment capital.

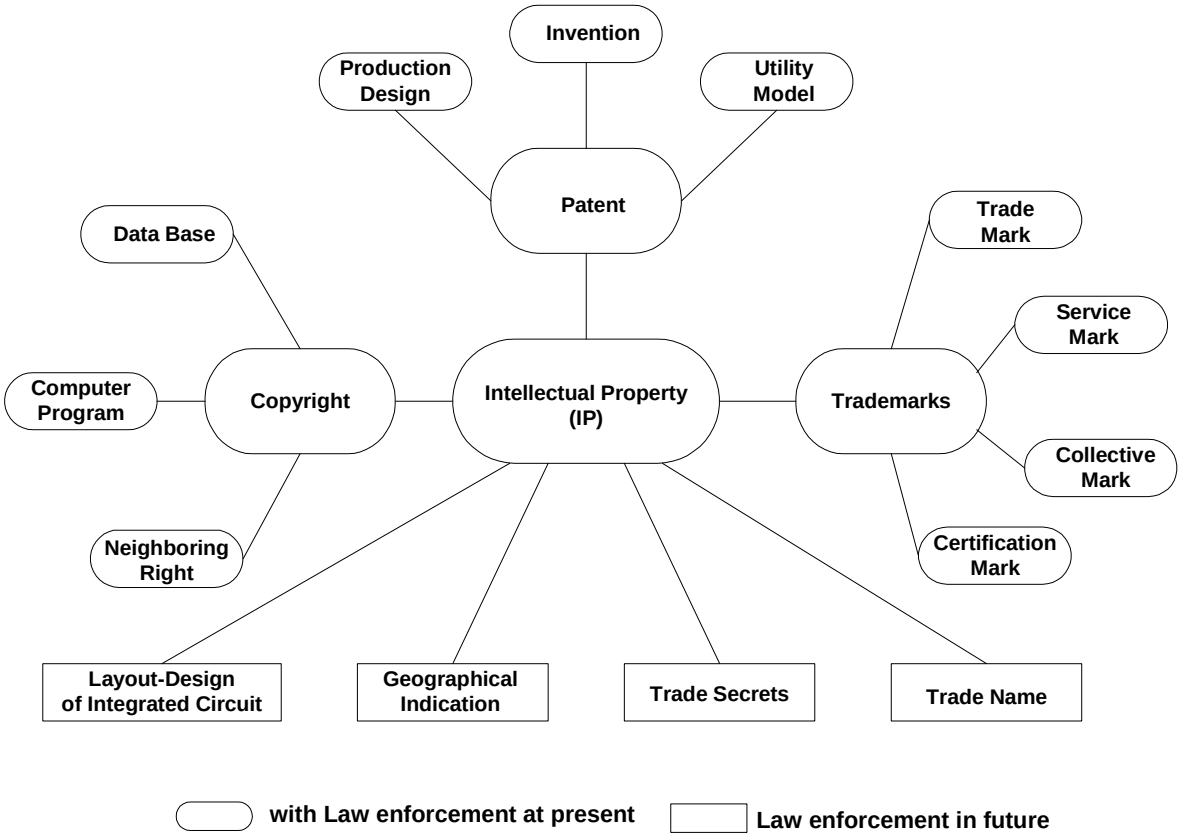


Fig.1 IP Assets in Thailand

1. THE POLICY FRAMEWORK

THE GOVERNMENT'S POLICY

During 2002 to 2006 of "The Ninth National Economic and Social Development Plan", Thailand must balance her objectives and targets to "The Sufficiency Economy Philosophy". This means that the economic structures for production, trading, and service sectors have to be adjusted. At the same time, the country also needs R&D budget to improve science and technology development for good trade competitions of the government's and private sectors. Although R&D budget is specified at 0.4% of the GDP, the real figure showed that only 0.18% was spent in 2003. (2003: R&D budget is approximately 10,218 MTHB for both sectors and is approximately 1.02% of the total government expenses)

IP LAWS

Thailand had the first IP Laws in 1979 which covered the Industrial Property. The modifications of this law had been made in 1992 and 1999 respectively.

The second IP Laws covered Trademarks was announced in 1991 and modified in 2000.

The third IP Laws covered the Copyright was in 1994.

The fourth and the latest IP Laws in 2000 was on Layout-design of Integrated Circuit.

Since the international trade negotiation deals with all kinds of IP's, Thailand has her obligation to announce more laws of IP in the future.

Still, there is no Government's Law of IP partnership. The MOU and the project contract are the only legal documents for the University-Industry partnership practice.

When there is any U-I partnership existing in any university and/or in any company, MOU and/or project contract must state some institutional regulations between the two parties. Furthermore, both university and company must have their own regulations to control their staff to have the project fulfilled with agreeable success. Mainly, the regulations are about how U-I can work together, like working place(s), job descriptions for their staff, working steps, periodic meeting to solve some problems and work follow-up ,and other needed working rules. It is in the MOU or the Project Contract that states some agreements about the ownership of IP assets, the sharing of work benefit, time terms, work secret practice, and permission on some publishing or work disclosure (that have no effect on patenting, this depends on the partnership policy of both parties and the staff selection to fit the agreement well).

Again, there is no general MOU or project contract (in a standard form) to cope with all requirements and regulations that is best for both parties to practice their task happily together.

The Ministry of Finance had registered government and private firms, the government firms include the universities or institutions, for R&D activities. About 200% of the expenses can be deducted in the tax

clearing forms for any R&D spenders who chose the service from registered firm(s). This Ministry's regulation is benefit to promote R&D in any firm, especially in U-I (University – Industry) projects.

The Ministry of Commerce is in charge of the IP through The Department of Intellectual Property (DIP). Since the patent granting process is quite long (2 to 5 years), to minimize the search and examine process (in time spending), DIP had made MOU with Thailand's group of University and Institution (16 members, at the first state). DIP hopes that each expert of the group will need 45 to 70 days to finish their examiner task and have their fee of 2500 baht (min) to 20,000 baht (max) per case (depends on the number of claims). The MOU was signed on February 25, 2005. This brought some benefits for university staff of experts and for the Government also.

2. THE EXTENT OF UNIVERSITY – INDUSTRY PARTNERSHIP (U-I PARTNERSHIP)

HISTORY

Consultations started relationship between U and I. Graduates asked their lecturers to help them solve some technical problems, and lecturers gain experience from the industry, this is very helpful in the teaching work also. Sometime, owners or company executives are lecturer's friends. They invited U staff to do the part-time job as the company's advisors or consultants. Of course, some undergraduates or graduated students took part in helping their advisors in the companies as well as in some projects in the companies, and this related to their finishing of thesis or papers. On the other hand, some company's staffs had part-time job teaching in the universities through the relationship and their skill. This personal relation is the first step of U – I partnership in either collaboration or business partner.

PRESENT

At present it is the need of The Thai Government to have each university free from the government fully – controlled to the government partly-controlled (in policy only), and the government will partly support its budget to the universities, especially in non-private universities. The government permits the universities to operate all academic services without commercial taxes. This brings commercial offices to the universities with the same servicing purposes but in many different names. The government also guides the industrial and business sectors to work together with universities to gain more IP assets and utilize these assets in commercial and industrial companies by setting some working committees from these three parties.

The industry needs more IP assets to do good business. This is not count for the foreign companies or the Thai-Foreign joint-venture companies, since they import IP assets in "Know-How" and pay for royalties. However, they need some training for their human resource and also some technical modifications in production process, both in hardware and software adjustments. For the Thai (local companies), they need IP assets, mostly in copyrights and trademarks, to improve the present business achievement. No questions about their need of industrial properties to produce new products in the future, the needed assets include patents and petty patents indeed. The Universities have good potential in sharing R&D with The Industry, they can either select good R&D project available or work for the requested R&D project to the industry's demand. At present, the most collaborate work between the two are technical seminar or training, and the basic laboratory tests. There also are some textbooks (in Thai) and some manual operation translation by The University for The Industry, on special tasks, and on demands.

PARTNERSHIP BENEFIT

For U – I, the trading of technical knowledge with skill will bring good IP assets. Very little R&D tasks are from the company's laboratories. Only large companies have their own R&D departments. They may contact U for buying some IP assets from the IP office of the university, or

go to the researcher directly, in person, on special purposes, and pay them in lump sum.

U – I partnership is good if it is in good balance of the partnership benefits, but it is not easy to do at all.

We can see that if the development for U – I partnership is in good direction and working properly, good incomes can be brought to both parties, with a good credit to the Thai Government for the supports in laws and policies.

3. THE NATURE OF U-I PARTNERSHIP

Here, "The Partnership" is for "co-operation", "collaboration", "aiding", "funding", and all activities that give benefits to each or both parties, The University and The Industry. In Thailand, at present, it is very hard to find U-I partnership as an exact business partner. Before "partnership" there is "relation, and before "relation", there is "connection". This is the usual tradition for the Thai business practice, especially in Thailand since they believe that "good trust" come with "good connection" Anyway, now, good reputation or good references can also introduce some U-I partnership without any good connection at all.

Partnership activities between U-I are:-

A. Funding post – graduate student with or without obligation
B. Funding researcher in the university for R&D purpose
C. Consultancy by University (to The Industry)
D. Training or seminar by university staff at the industry's place or on the university campus
E. Joint training or seminar (by U-I) to public
F. Contractual research to support the company's R&D, with or without incubator, on or off the university campus
G. R&D joint – venture that leads to spin – off company
H. Special joint – project, usually a short term project for a special purpose, in designs, testing, experimenting, and others

Notice that all activities produce IP assets, but only in F and G that the IP protection by patenting is very important, and the partnership relation, U-I, must strictly be business.

Generally, funding (of A or B) passes through faculty channel rather than the university business office. Regularly, MOU is used in C, D, E and H. Sometime MOU is for F and G before the signing of contract (For G).

Very few universities in Thailand have their own activities in licensing and technology transfer to the other sectors of business or industry. The most popular way of technology transfer is through the consultancy, and without any licensing. The very small number of U-I partnership incubators at present limits the utilization of IP asset in patenting. In the near future incubation will become more popular since it makes U-I partnership in a more profitable way.

The partnership produces IP assets such as thesis, data of knowledge, designs, operation manuals, computer programs, texts, petty patents, patents, and other copyrighted documents which are grouping into Industrial Property and Copyright. These assets need some better management for the commercial and industrial uses.

4. THE MANAGEMENT OF U-I PARTNERSHIP

In Thailand, the administrative and organizational set-up for U-I partnership is quite variable in forms. There are some factors of consideration, which are:

A. The background of U and I (which has the same field of interest in R&D project to match the proposed product). The background here consists of the project site, the management concept in practice, the capability, the authority, and the readiness of R&D necessities in the proposed project. Compromise will lead to decide some office or incubation unit set-up for work sharing between the two parties, and also including the team selections.

Other factors are the notification of the following topics (B to E).

B. The type of IP output of the partnership and its expectation of success in IP asset is clarified to plan for the budget and the schedules of work.
C. The ownership and utilization of the output assets are very important and must be clarified.
D. The possibility of having a spin-off company in the future, or the possibility of technology transfer and licensing, must be noted.
E. Laws and regulations from the government are considered.

A to E are topics of interest for both U and I in planning a set-up of U-I partnership organization. U and I can set-up their proper administration and organization for their own style. Since background of other universities and other industrial firms are different, it is true that each U-I partnership organization frameworks has their own contents and structures.

In most of the universities in Thailand, each of them has an IP asset office under The Rector or Vice Rector control with different names in different universities. In some universities, these offices control commercial work for them as well, but in some universities IP section is only a part of the university's main business office (which has one director under a committee).

There are some universities which have technology transfer activities under different names of their IP asset offices such as

- Chulalongkorn University Intellectual Property Institute, Chulalongkorn University
- Applied and Technological Service Center, Mahidol University
- Research and Intellectual Property Promotion Service Center, King Mongkut's University of Technology Thonburi
- The Office of Property Management, Kasetsart University
- Industrial Technology Center, King Mongkut's Institute of Technology Ladkrabang

At present almost all universities in Thailand do the technology transfer tasks by licensing their patented technologies but they have no exact name of "Technology Transfer Office" in each of them.

Interviewing the people in charge of managing IP at Chulalongkorn, Mahidol and King Mongkut's University: the author have conclusions in various management aspects which are:-

- Each university has IP office with 2-5 people to do the technology transfer task (but does not have the direct name of "technology transfer office").

- The university has its own IP policy in patent ownership and distribution of royalties (varied from 40% - 70% to the inventor). It is the university who bears the costs of filing patent applications.

- Most of the universities have patents in their fields of strength, including Chemistry and Applied Physics as their second popular patents.

- The university has incomes from licensing its patents, each ranging from 100,000 baht to 100 million baht. They prefer both of exclusive and non – exclusive licenses in general.

- Patented technologies can lead to a start – up company with researcher can hold the stock or other benefit (licensing fee) or both. The researcher can take time off to set up this company.

- Patents are considered by the universities as work load and academic success for each researcher.

- Disclosure of the research work can be partly done in an academic way but not with substantial knowledge, information, and details that may lead to the filing of a patent.

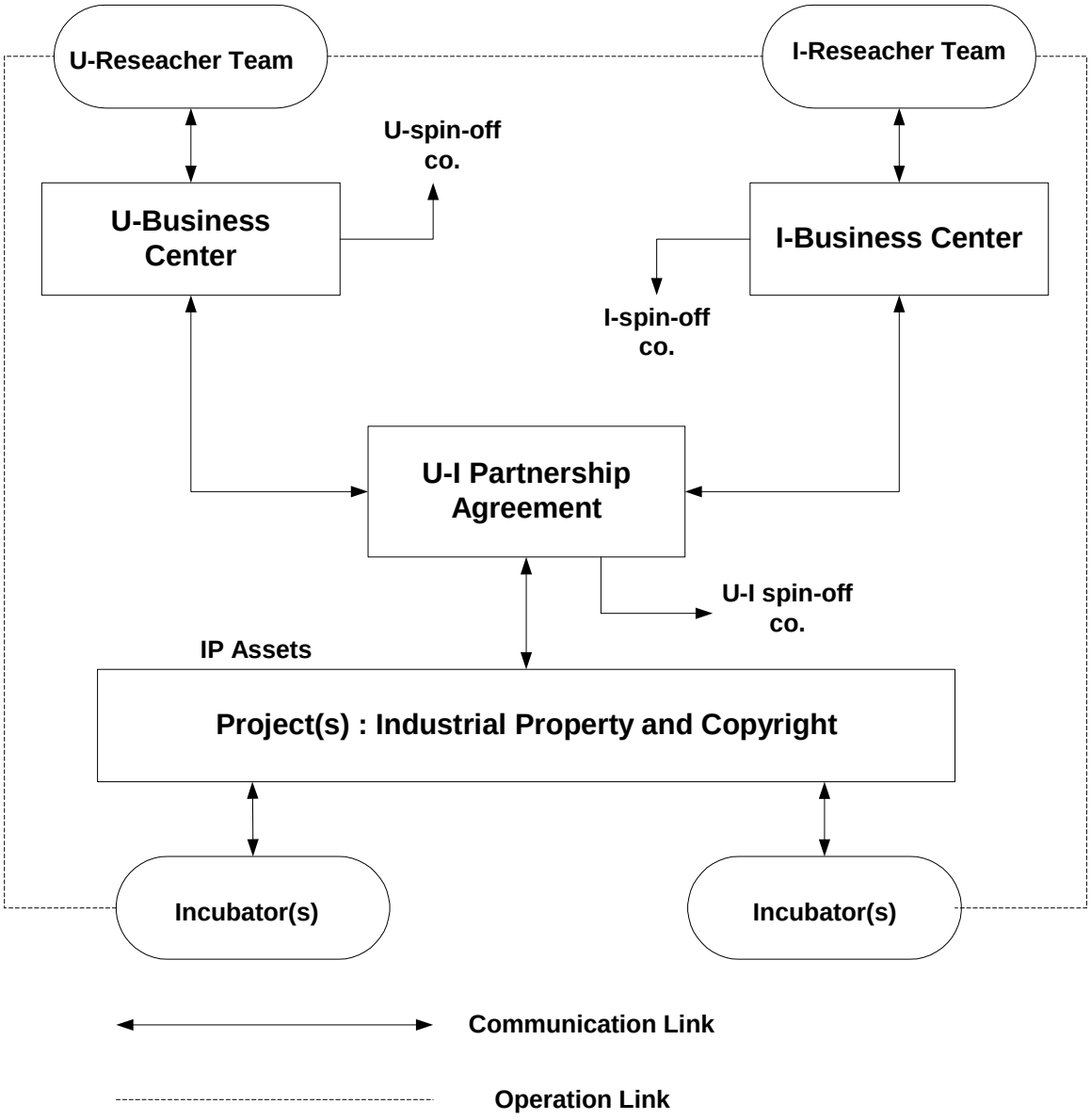


Fig. 2 Thailand's U-I Partnership Scheme

From fig.2, notice that The University's research staff can be from teaching and/or research profession. The Industry's research staff can be its R&D staff or those selected from the factory on a special mission. These staffs are controlled by their administration offices.

Some U-staff, without engagement to the university's business office who have some relation with the Industry can directly work as the company's consulting freelance.

U – I partnership usually operates under the university's business office. The project goes on when a project leader and his team work has been chosen. All schedules, procurements, financial matters, and office work must be good enough so that the project will go on target. Here, to reach the goal, methods and standards of quality control and management are put in. IP asset output is evaluated. MOU or contract is re-read before a further step of IP management between the two.

Marketing research and business planning play a very important role in commercialization of the IP asset. The first output may be better or worse than the expectation (prior to the writing of MOU or contract). Selling the invention, licensing to other firms, setting joint venture, or establishment of a spin-off company will be discussed again between U-I partnership for their best mutual benefit.

As seen from Fig. 2, according to the U-I partnership agreement in each project, IP output can be commercialized by a spin-off company in three ways. The university as well as the company can have their own spin-off company. Here, the university staff involved in the project will have their sharing in that company by owning some stock and doing academic advisory. Some alumni will join with the university to run this company by investing some capital and managing this company. It is hardly found that the university and the industry will co-invest in the spin-off company after their successful IP output that aims for the commercial scale. In most practices, it is by the industry side that intends to create a new company using technology transferred from the university or from the output of U-I incubators.

5. THAILAND R&D SOURCES OF FUNDS

The Thai universities get funds from many sources. These funds are expended in various useful objectives, such as for students and researchers. For the student graduation in Bachelor's Degree, Master's Degree, or Doctoral Degree, these funds have nothing related with IP asset output expectation for commercial uses. For the researchers, spending of funds on equipment and material, also for the researchers themselves, produced work in both pure research and applied research which is quite an academic output of knowledge rather than in an industrial application. (However, some research work can give some development for industrial products). Most of the researcher or student funds are from privates and foundations who are wealthy or who get money from donation, or even from the big companies, who give them for free, only for the education purpose. It is quite interesting to see that some alumni foundations which are in The Universities have no interest in providing fund for business purpose at all.

Thai Government and their related sectors in business always have objectives in giving funds to universities. Most of the funds to the researchers are more of to "know" something than to "get" something. Anyway, this trend is changing. In the past, social welfare was needed to be better, and then the research work aimed in knowing something to improve or solve problems. Now, commercial and industry in the country are developing, so the country thus needs IP output that can be commercialized. That is why funds from the government's business sectors to the universities require more productive of IP assets.

Now, Thai Government provides funding to support U-I collaboration projects as fully-support or partly-support in training or consultancy by university staff (U-staff) to industry staff (I-staff), normally at the industry sites.

Some government sectors are assigned as R&D institutes, which have their own researchers, work closely together with industry staff aiming for prototype development. University staff join with them in the projects of which using some of the university's facilities and equipment.

Here, funding is paid by the government, and will be paid back later by the industry, if the IP asset can be commercialized.

For U-I partnership, funding can come from the partnership who can get fund from their own sources or permission of the donators. It is I, who will pay for academic services, materials, and some new equipment or devices. The U will share them with permission of time that the U staff can work for the project in the university by using its facilities and laboratories. Budgeting for U-I partnership may include an incubator and its operation expenses. Since U-I partnership expect that the work output must be some IP asset of useful programs or inventions, financial planning before the signed agreement is the boundary for funding and budgeting of the project. If work will go on for the prototype development and for other pre deciding about commercialized activities, it is necessary that both parties must agree on the source of fund.

6. IP FOR SMEs AND OTOP IN THAILAND

SMEs

The small and medium companies play major roles in the country's business and incomes. They have the 99.5% in total number of sharing compared to 0.5% sharing of large companies. They produce a GDP of over 2 MMTHB, and there are more than 6 million jobs occupied in this category (2003). These companies are trading companies and industrial companies with local sales, import, and export business. And, of course, IP assets are their investment capitals to sell, produce, and service of consumer and non-consumer products in and out country.

Economic crisis (in 1997) affected all companies in the country. The Thai Government with two ministries (The Ministry of trade and the Ministry of Industry) set up committees to solve this problem and defied that all companies of fewer than 200 MB in asset are classified as small and medium enterprises or SMEs. Many activities are set up for SMEs to save their financial situation. One institute called ISMED (Institute for Small and Medium Enterprises Development) was assigned to work with SMEs in developing business know-how (training and seminar) and

piloting "in-wall" and "out-wall" (of ISMED) incubators through its "Incubator Center". University teaching and research staffs are occupied in most of their projects either in training or incubating tasks. This is not a true U – I partnership way of IP asset gaining since MOU or contracts are signed between U and ISMED or even some private companies and ISMED.

Some private companies have made contracts with universities for part-time U Staffs and they may employ the staff directly for their holiday jobs. This is quite a practice in all training courses.

Department of Industrial Promotion at The Ministry of Industry is responsible for the promotion of New SMEs. In 2004, they plan to increase 50,000 new SMEs through the incubation way of business and product development, by having new graduates, businessman relatives, ones who want to be a business owner, retired citizens, non-occupant people, and those who tried to do some past 1 or 2 years in business but have no success yet, as their targets. The department, with The Trade Council of Thailand, and with The Industry Council, as their helping hands in developing the incubators, will be supported by 7 business associations. The expectation is 150,000 new jobs. The new business companies will be in the categories of auto-part, fashion, IT and multimedia, food, tourism and other good potential business. The business incubation for them is under NEC (New Entrepreneurs Creation) project. Here, the government supported innovation (from R&D) will be utilized.

OTOP

The country area of Thailand is divided into 76 provincial areas. One province has many districts. Each district is divided into many tambons (or sub-district). One tambon has its own organization. This organization must operate to raise-up the standard of living of all populations in that tambon. There are 7,045 tambons in Thailand, whose populations are quite good in handicrafts, and those of which also already have these products consumed locally.

To earn more income to each tambon, they should have some good, famous, and quality local products for sales in their area either as tourist souvenirs or local consumptions. OTOP, is from "One Tambon One Product", a government policy to boost the best product of each tambon in a commercial way through the country's SMEs, or if possible, in the world market. The followings are OTOP goods: food and beverages, clothes, appliances, ornaments, decoration work-pieces, handicrafts, souvenirs, and non-food or non-medicine herbal products.

IP assets, to which SMEs or OTOP will produce, should be protected. DIP (of the Ministry of commerce) has asked Universities to cooperate in this matter. Many training courses and consultancies bring about new OTOP or SMEs inventions. Laboratory work helps improve some old product to a better quality as well.

The Government hopes that "grass-rooting" economic policy can bring good popularity to them and SMEs can get better financial situation by utilizing of good IP assets.

SMEs can develop their relation with Universities to U-I partnership with the selective OTOP goods. Now, universities at any part of the country can have some joint-venture activities with the local SMEs. The U and U cross-relationship also can improve some technical difficulty in consultations and they can exchange some special laboratory equipment or devices to help gain a more scale of success.

7. PARTNERSHIP SUCCESS AND FAILURE FACTORS

Less than 200 patents from all universities were granted between 1995 to 2004 (see Fig. 3). Around 12 universities produced those patents of which they hoped that they can make incomes by licensing them to the industry. It is quite clear that between the years of 1995 to 2004 the numbers of patent granted are fluctuated (see Fig. 4). If there are no difficulties between U and I the patent granted rate should be a progressive one. This shows that Thailand must do something to promote the good relationship of U and I, since the number of patent

granted to U-I partnership in the period of 10 years to present is very small (see Fig. 5).

Fig. 3 Patent granted to Universities From 1995 to 2004:

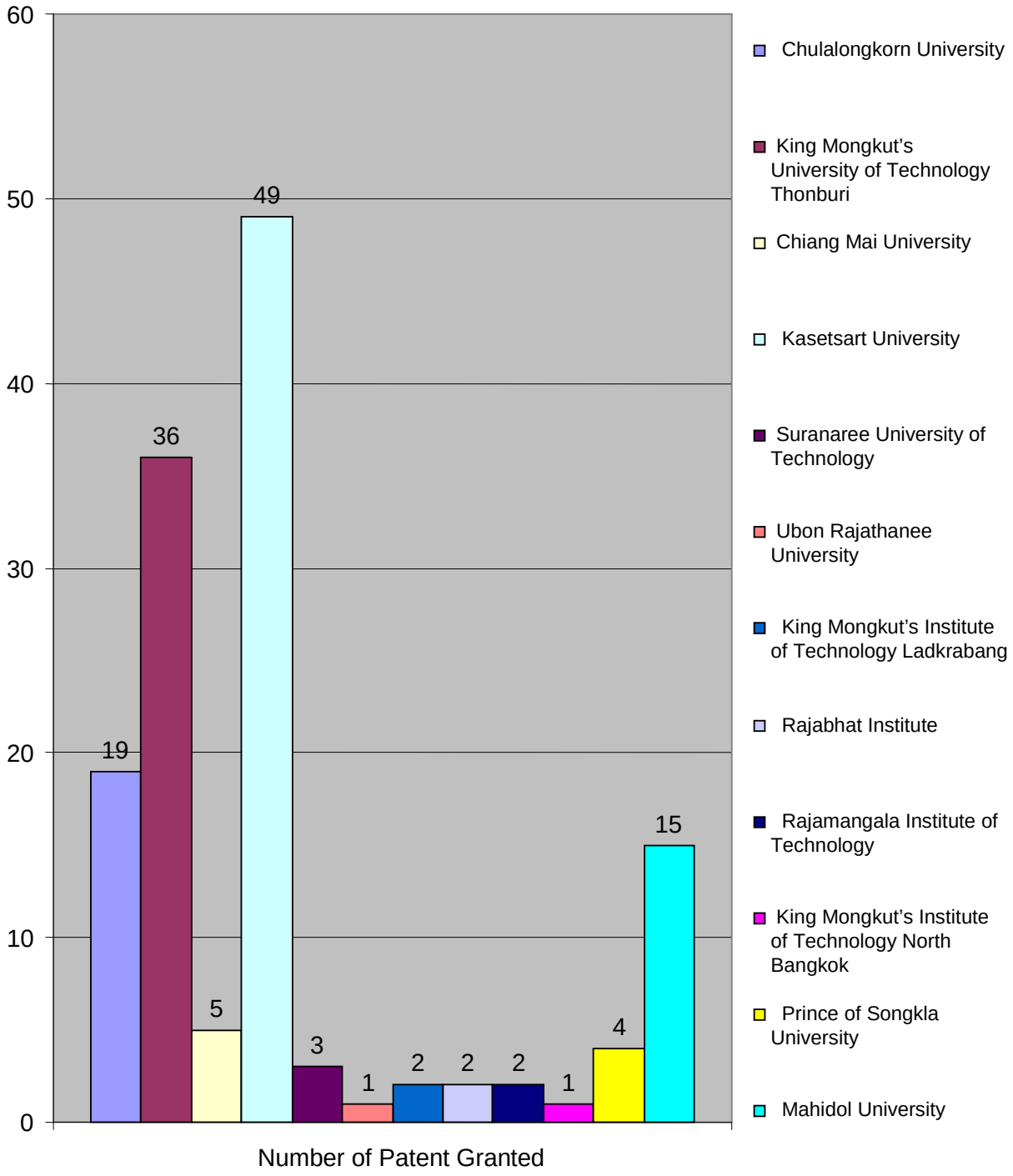


Fig. 4 Patent granted to all Universities between 1995-2004:

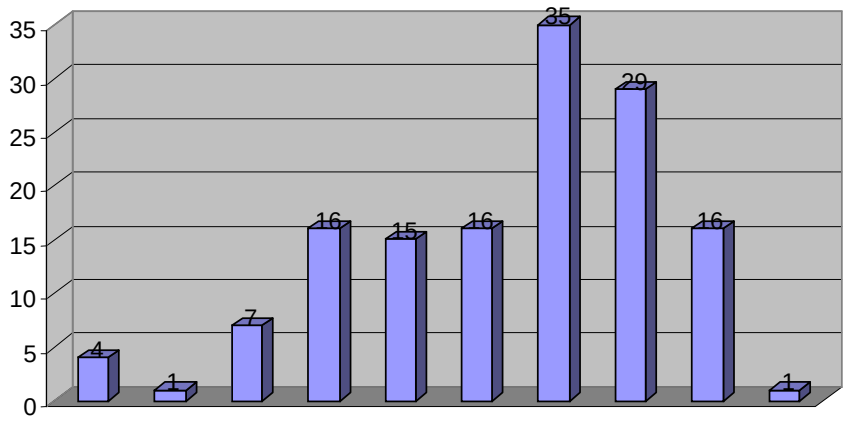
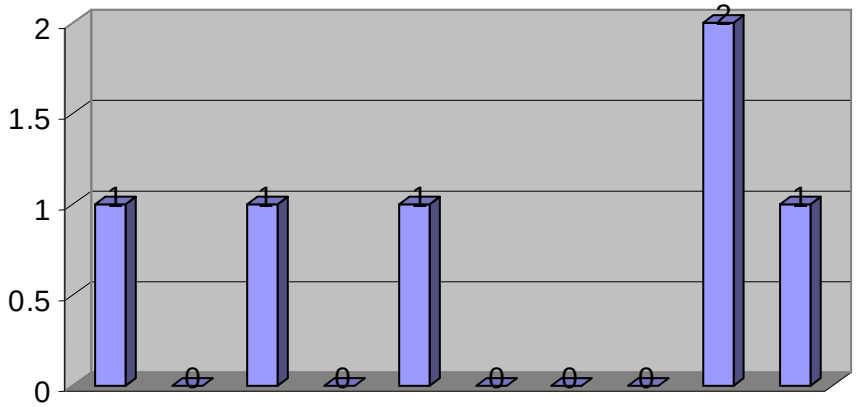


Fig. 5 Patent granted to U-I partnerships between 1995 - 2004：



At present, Thailand is not an industrialized country with good competitive technical know-how in IP and IP asset utilizations. R&D projects for commercial purposes are very few. Only in some universities and large companies begin to develop this kind of work. Of the rare U – I partnerships, mostly in consultancy and training (rather than R&D for new product), we can see some differences in many aspects, these lead to a small growth-rate of the partnerships between them, and if we need more partnership success in terms of partnership quantity or partnership output

asset, we have to balance their differences in order to narrow the gap between them, not their potential of skill and knowledge, but their sense of understanding and good attitude towards each other.

Here are some particular subjects affecting U-I partnership relations:

A. The differences in nature of organization that U produces graduates of human being, while I produces product of material in many forms, make a difference of organization behaviors in such a way that I always need profit from its product but U is a nonprofit organization (In the government's university, students pay less fee than their investment per head according to the government budget calculation. In private university, the profit margin of this educational businesswork still is not high) .This causes a slight contrary attitude towards each other. People can see their different earning by their basic salary that U- staff has an average of lower salary than I- staff. Except the famous, successful executives (sometime with an Honorable Degree), U- staff get higher social acceptance than I – staff. The U – staff himself always get respect from I-staff too.

B. The different in nature of their mind of thinking, is known as a discrete of business mind and academic mind. Here, U-staff thinks of something in high value, but I-Staff wants to get a lower cost product of same quality. I-staff needs to keep secret of their new invention or product before the selling of that product but U–staff needs to share their knowledge to public like publishing academic papers. U–staff always waits for the sure results in experimenting anything while, I–staff needs quick action for business competition in everything. U–staff can do well as an individual performance; they dictate their advisee in doing the research together but I-staff prefer to work as a team. I-staff has more management skill than the U–staff they are also more flexible in doing or dealing than the U–staff. In developing IP assets, I–staff needs the output in a commercial way (good-look, good-use) but U-staff is quite happy to see or find that there is new knowledge produced.

There is no exact report of serious partnership failure, but the above different in organization and mind thinking natures of the two

parities really delays all work schedules and initiates more work adjustments for them.

In licensing of the patented technologies from U to I through the university's business office (IP asset office, with different names – not TTO), there are some difficulties between them. The author had interviewed some directors of the universities with technology transfer activities. Here are their difficulties with the industry, they have the working culture differences and lack of technology transfer experts (with knowledge of technology, business management skills, and IP asset management, the 3-in-1 type). Some directors said that their U-I teamwork was not good enough and some directors have problems with IP asset value estimation and business bargaining.

8. A PROPOSED IP MANAGEMENT SCHEME FOR U-I PARTNERSHIP

Benefits of IP assets to the industry can be seen clearly in many uses and applications such as for better product, process, program, and cost reduction. The H.R. development by texts and training are also from IP applications. In a U-I partnership, the university, including their staff of students and researchers, gain the benefit of industrial experience in many ways. Notice that, here, some publishing (without business effects) can be done, new specific equipment are procured, new knowledge and invention or some innovation can be found. The mutual activities of co-operation, collaboration, and joint-venture in various tasks can help them improve their attitude towards each other in a more understanding way. If The IP management systems are more efficient than at the present time, they can reach the state of last long joint-venture and may have some

quicker settings and more number of spin-off companies in the near future.

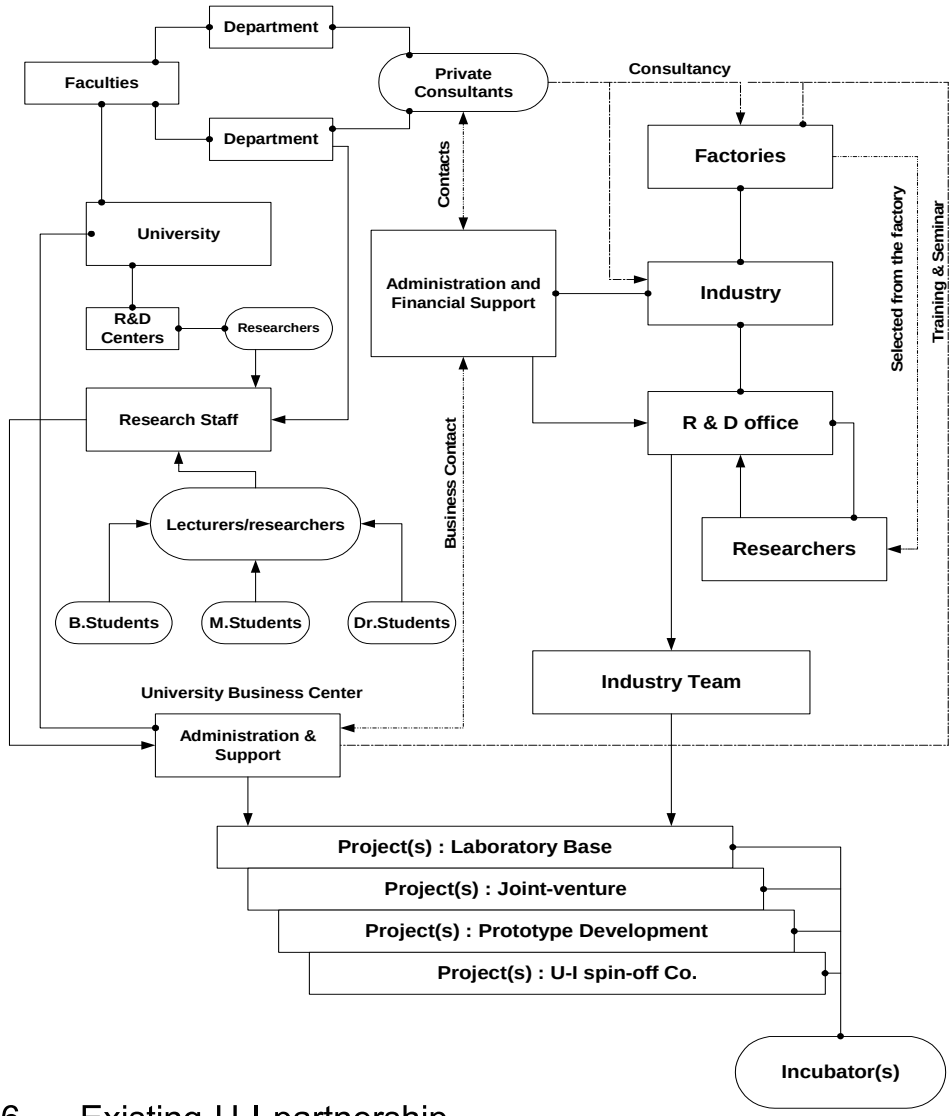


Fig. 6 Existing U-I partnership

From Fig.6, The existing U-I partnership contact-diagram is shown. In this diagram co-ordinations and co-operations between both administration offices are very important

We need an approach of having new IP partnership management organization which has the atmosphere of academic and business blending. Let us call this place of organization as "The U-I Partnership Office". Should this office is in the incubator area, or in the company area, or on campus of a university, does not matter at all. It is the project type, the readiness of staff, tools, and equipment with the appropriate investment of these necessities that decides this office allocation. Remember that it is better (in trade secret), to U and I, to have only one office in one academic field. And, it is possible that the university

can have various U-I partnerships with more than one company. The standard practices in this office must be set. The MOU or partnership contract must clearly state of the partnership target(s) or / and goal(s) of the IP asset produced, including the ownership and the publication agreements (in the given periods of time). Good working in resource management (man and material) and reasonable incentives to staff according to their duties and U-I partnership policy, with good administration and finance management headed by a capable project leader (full-time, office-boss, selected by U-I IP committee), can predict that the project will be a successful one.

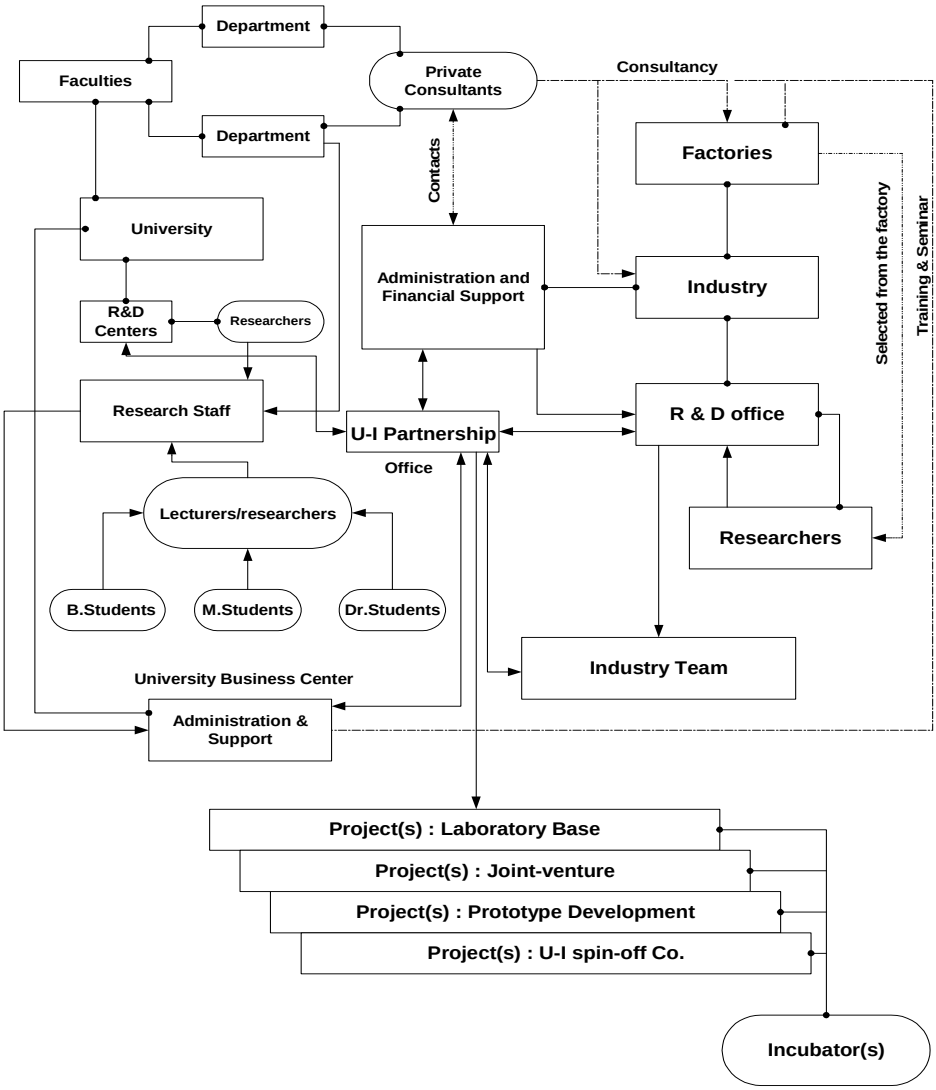


Fig. 7 Proposed IP Partnership Office

From Fig.7, the proposed "U-I partnership office" has authority and responsibility from both parties in all IP asset production and utilization.

9. THE FINAL DISCUSSION

All industrious work that leads to effective IP management in Thailand is challenging to U, I, and The Government.

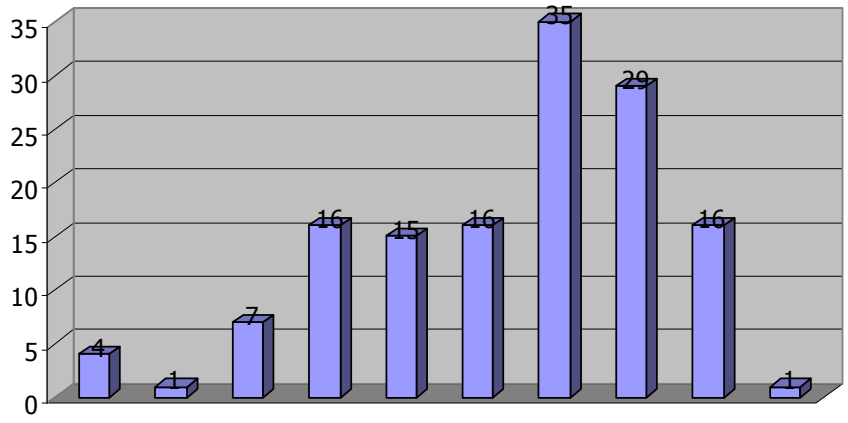
The step-by-step methods that will approach to some productive of good IP asset(s) by The U-I partnership should be selected. According to the country's background of industrial research and its applications, one can find that they need some changes. The Universities may change its policy of graduating good-overall students to good-overall students with IP asset-application. The Industry needs to change its policy of buying know-how from other sources to trying appropriate know-how from its local university-sources by collaborating with them. More demands of U-I partnership will certainly help in changing these policies. The Industry should set up some appropriate project with The University, especially the one with good potential in the field of mutual interest, and with good facilities and experienced academic staff. For the two parties, IP activities should be counted as their work-load. The granted patents or copyrights should be counted as their career-accomplishments. Then, more U-I work success will introduce more U-I partnerships. There should be more basic trainings in IP Practices and applications for both U and I including more training in Technology Transfer with the emphasis on promotion and practices. The government should continue granting and funding its budget on U-I partnership promotions with necessary new law enforcements to guide and establish work standards of mutual practices. The Laws must state U-I staff earning or benefit in some incentive style, this will motivate the U-I partnership settlement, and of course, the laws must include some mutual regulations on the IP office management between them.

Finally, Thai consumers are the real ones who judge the success or failure of SMEs those of which who selected IP asset(s) of their U-I partnership, for their co-investment.

APPENDIX A : DATA AND STATISTICS

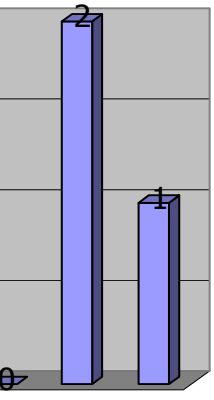
All information collecting from various reliable sources is re-arranged for quick data and statistics references. These data and statistics are the latest possible, all of which are officially confirmed by the Government's data base.

Patent granted to all Universities between 1995-2004:



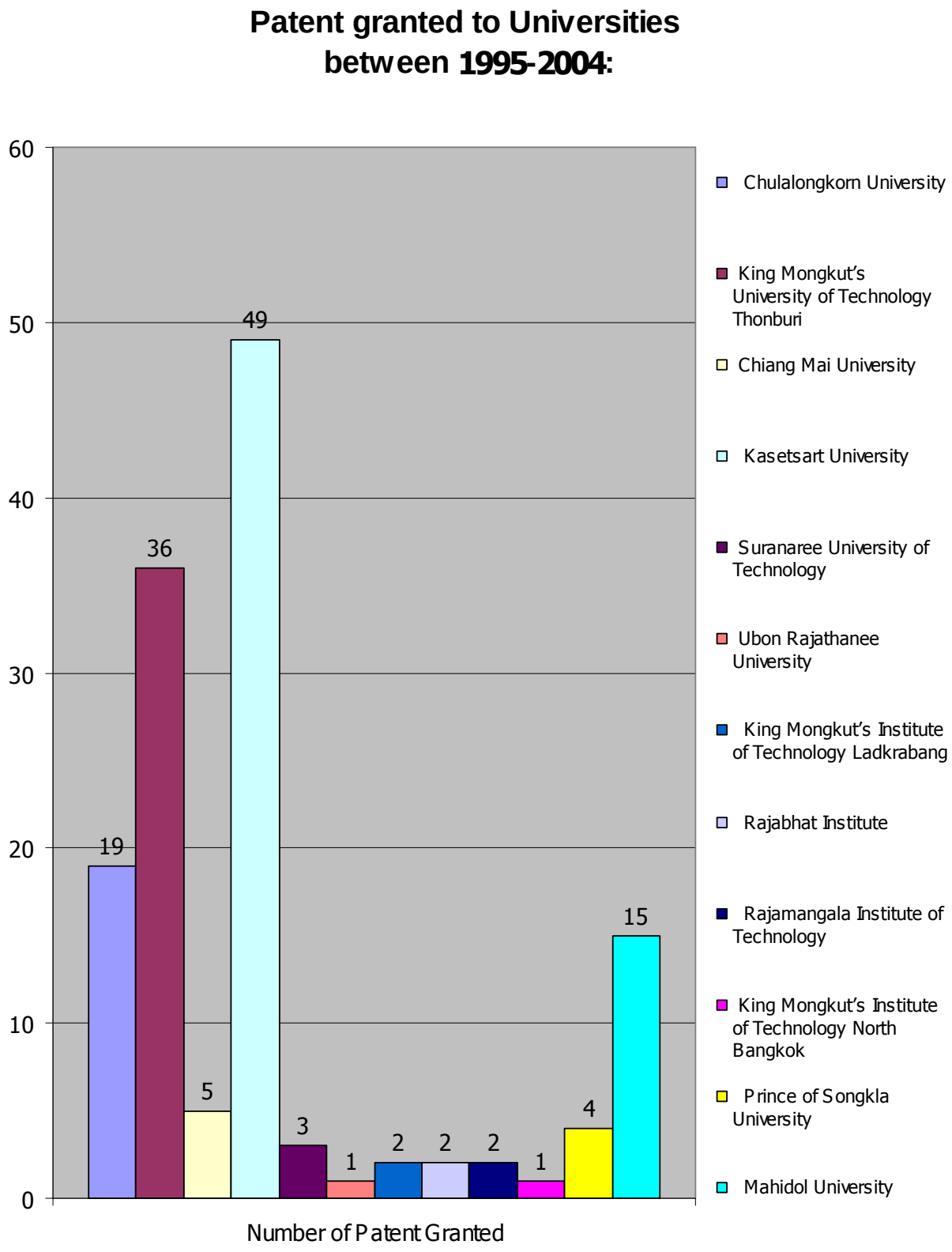
2002 2003 2004

2004:

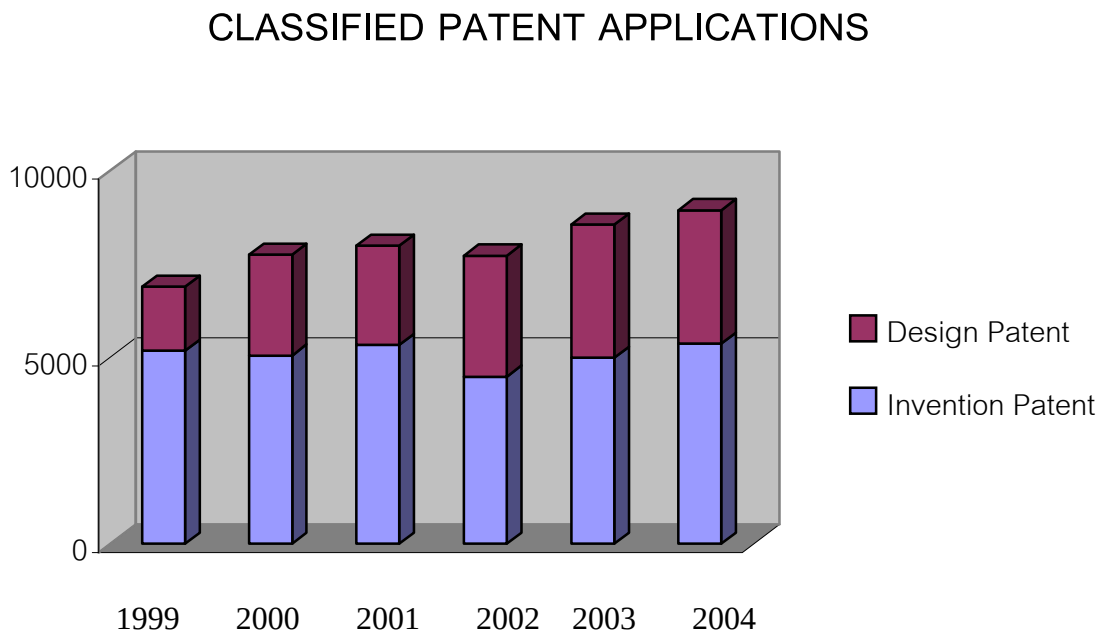


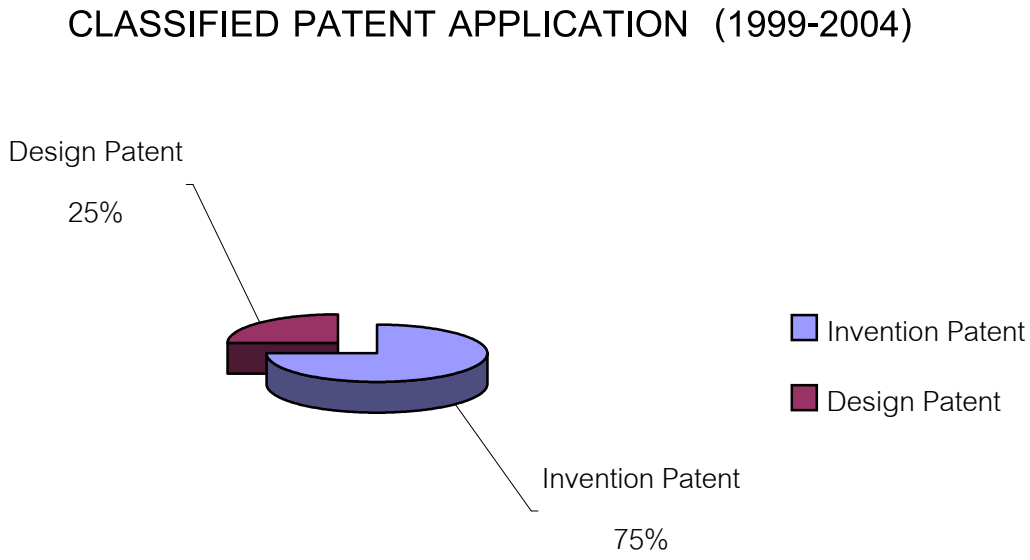
002 2003 2004

VERSITY-INDUSTRY

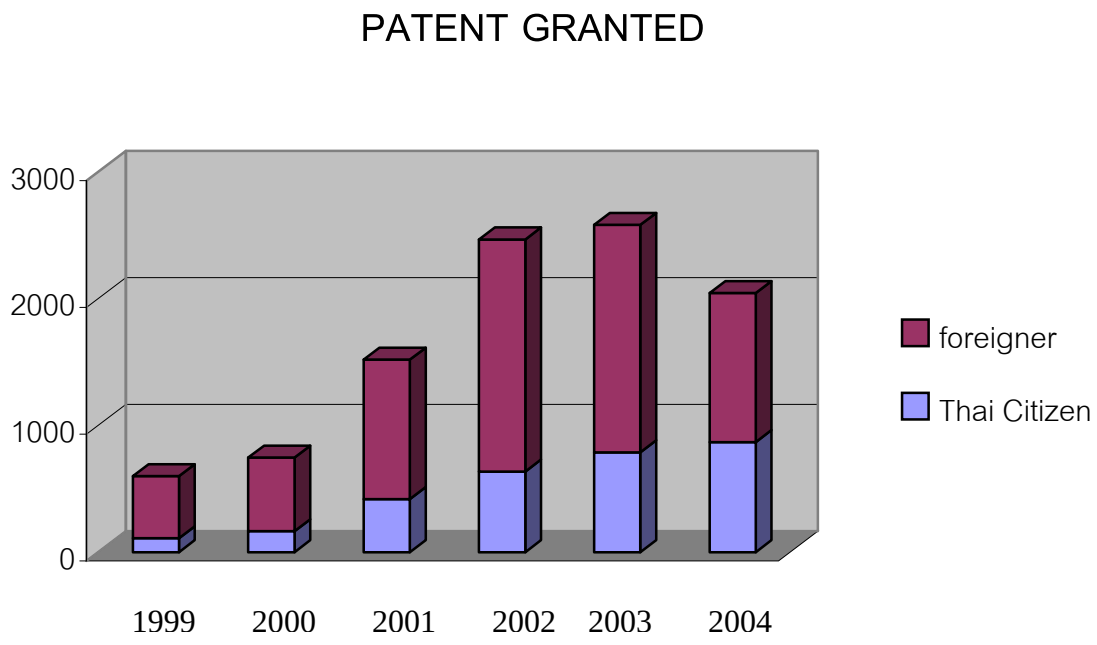


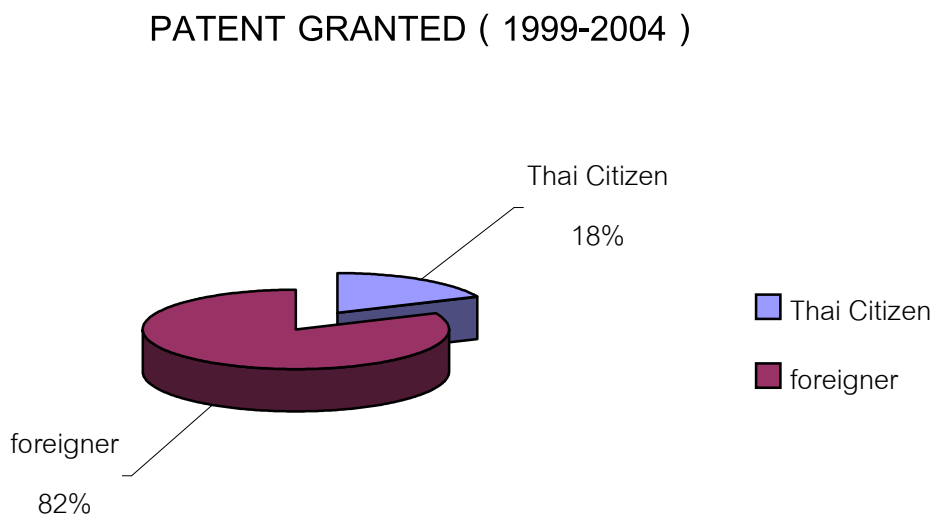
DATA 2: COMPARISON OF PATENT GRANTED AMONG UNIVERSITIES IN THAILAND



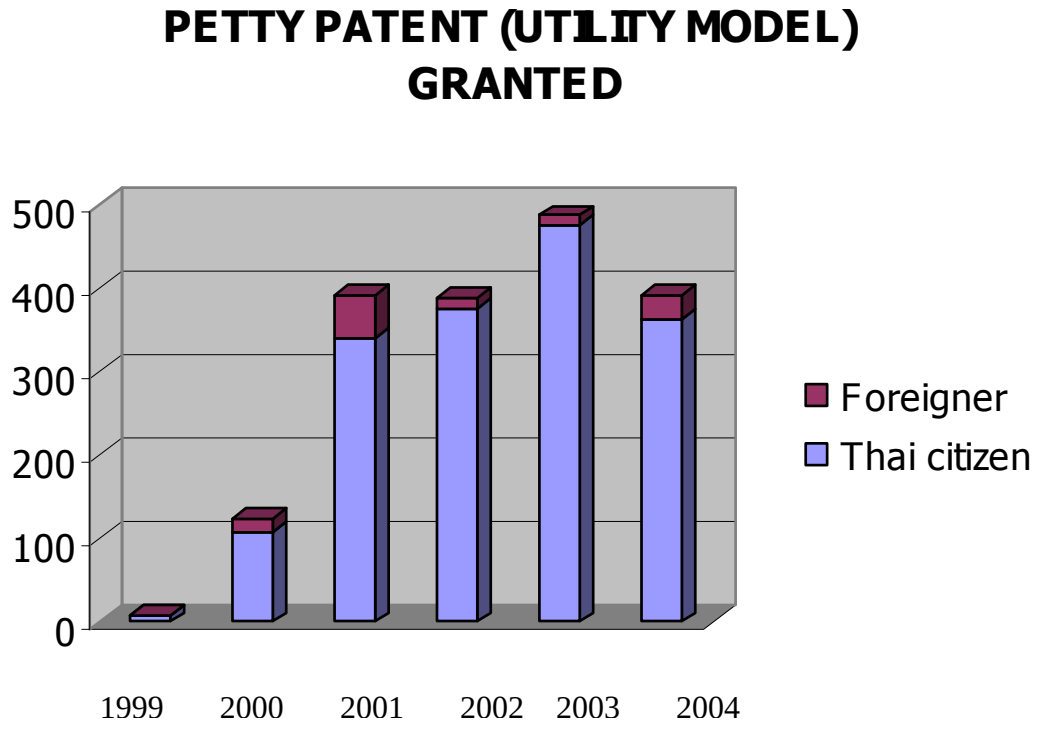


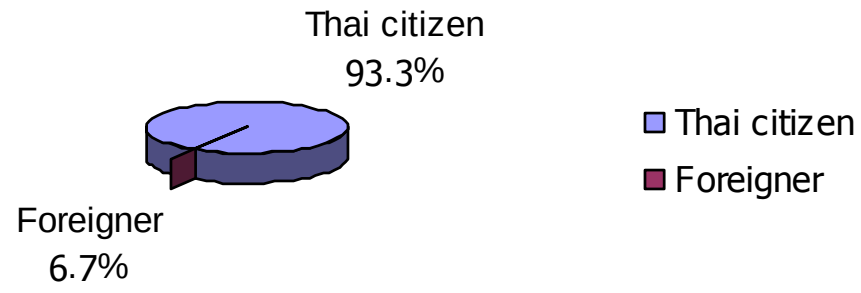
DATA 3: THAILAND'S CLASSIFIED PATENT APPLICATIONS



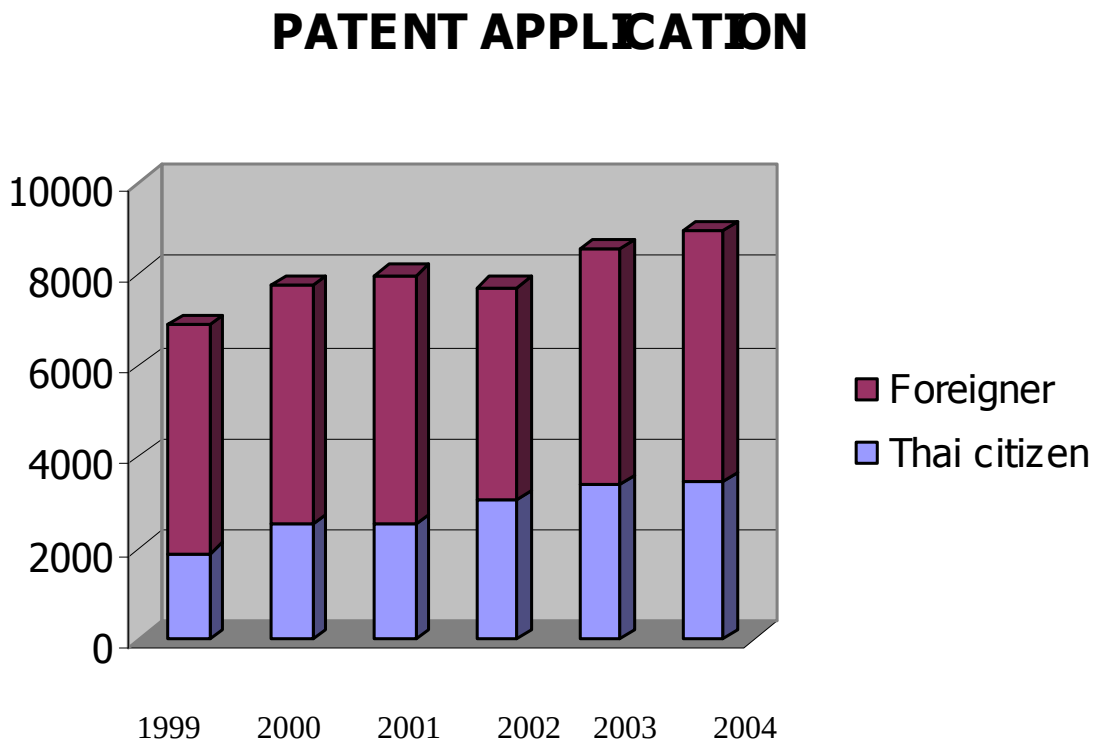


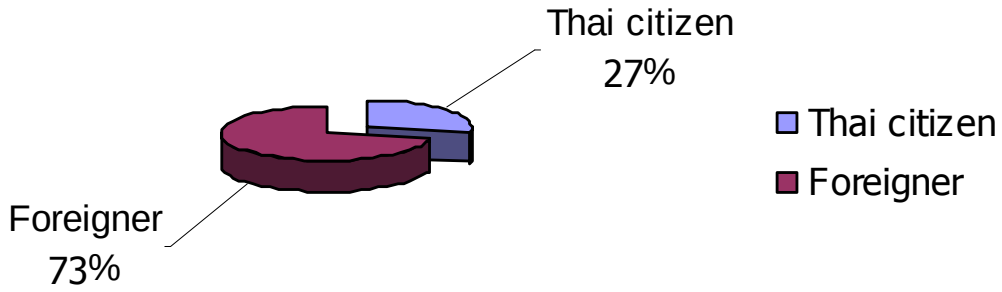
DATA 4: THAILAND'S PATENT (BY THE THAI AND THE FOREIGNER)



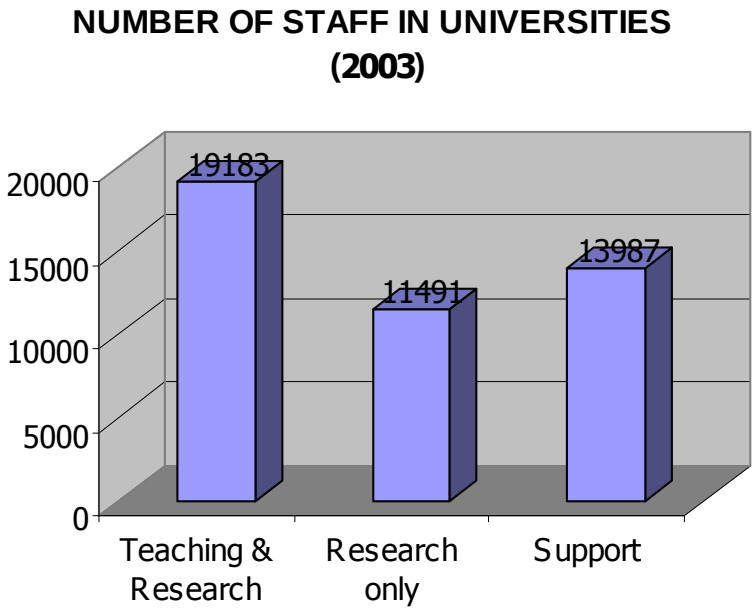


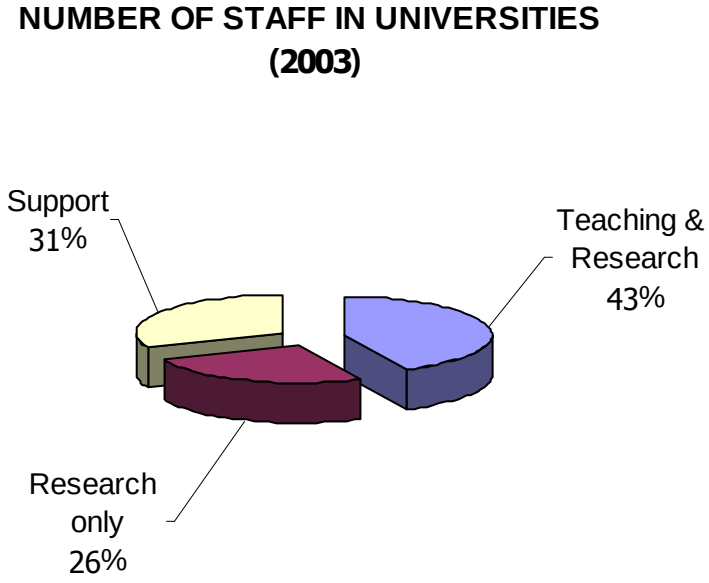
DATA 5: COMPARISON OF PETTY PATENT GRANTED
(BY THE THAI AND THE FOREIGNER)



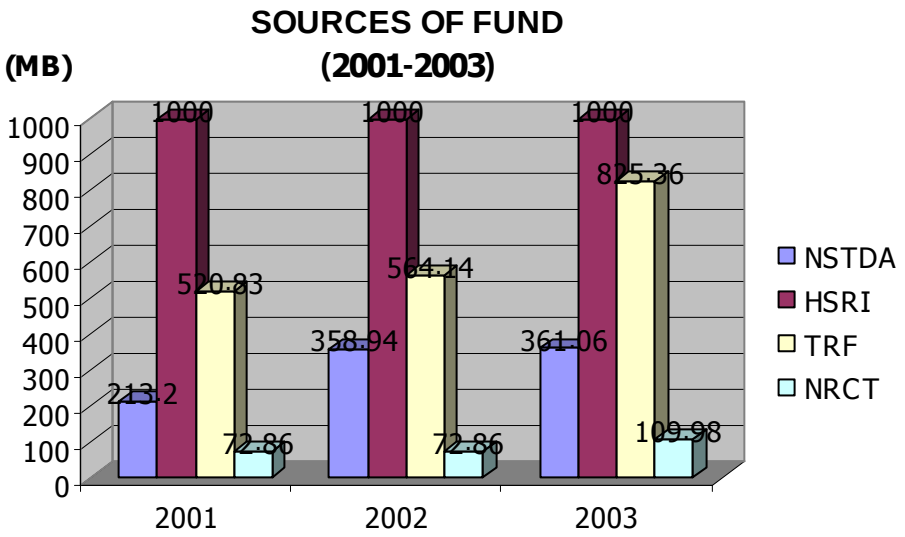


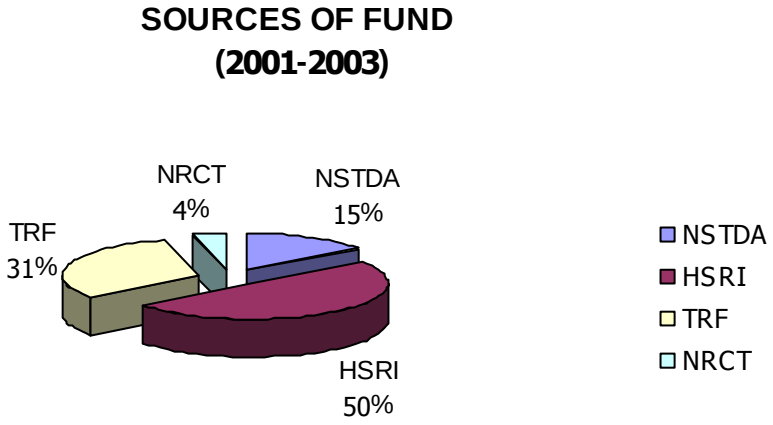
DATA 6: COMPARISON OF PATENT APPLICATION
(BY THE THAI AND THE FOREIGNER)





DATA 7: 2003 UNIVERSITY STAFF CLASSIFICATION AND NUMBER OF THE STAFF





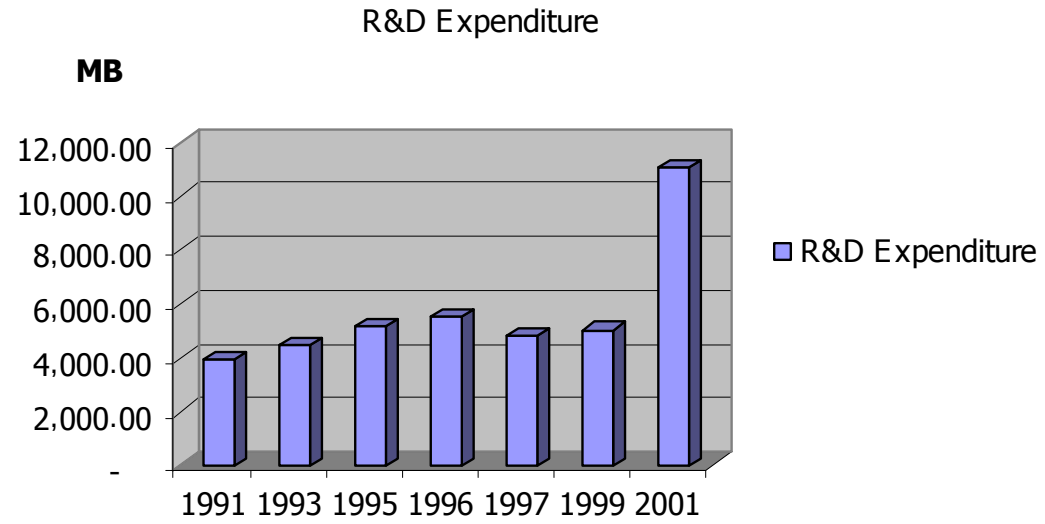
NSTDA: National Science and Technology Development Agency

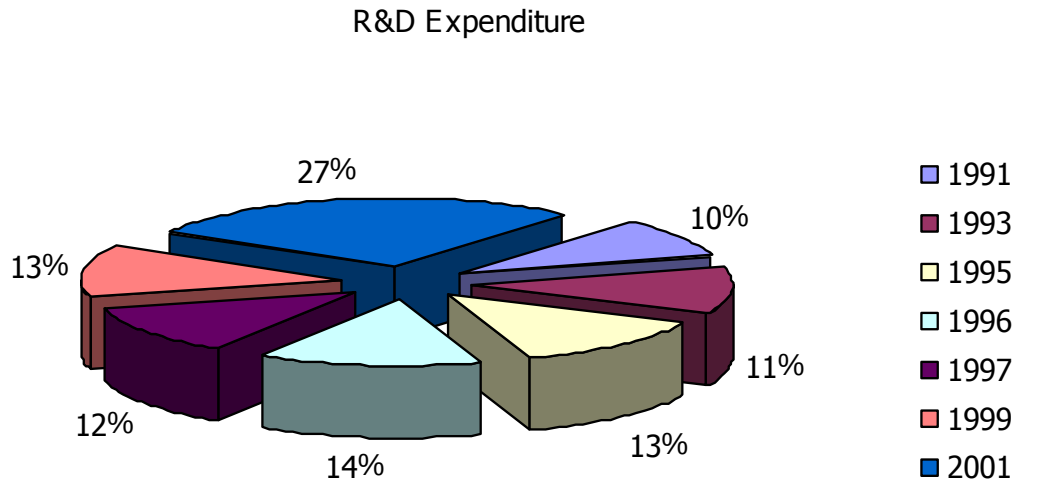
HSRI: Health Systems Research Institute

TRF: The Thailand Research Fund

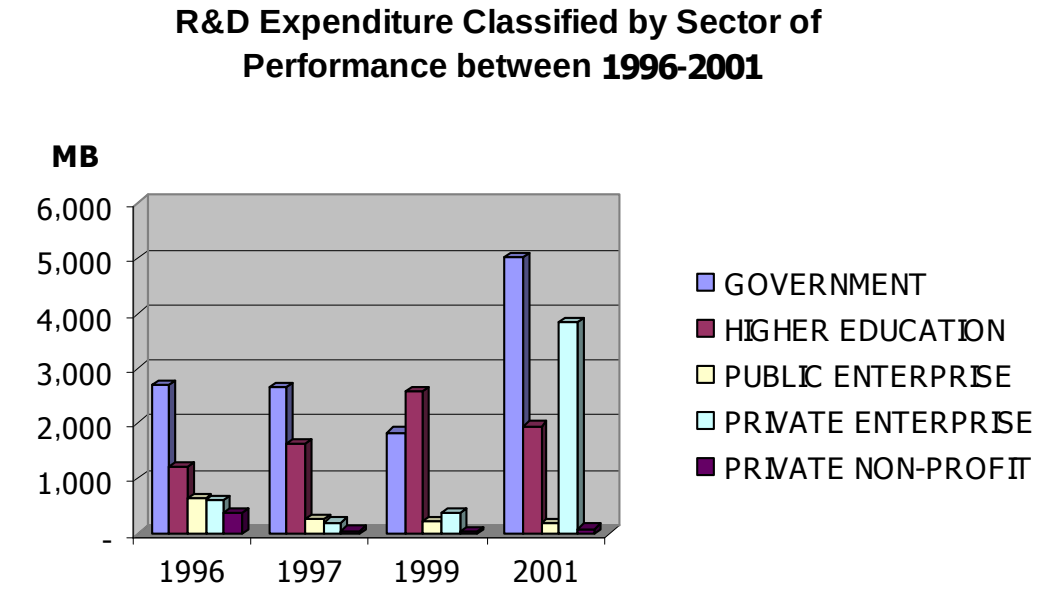
NRTC: National Research Council of Thailand

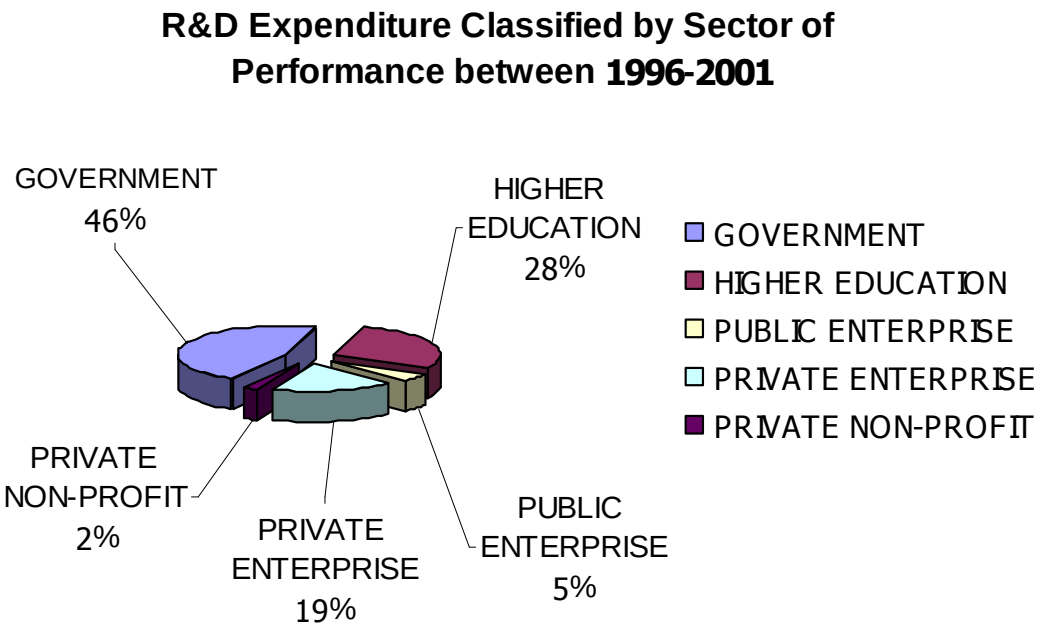
DATA 8: SOURCES OF FUNDS TO UNIVERSITIES FROM 2001-2003



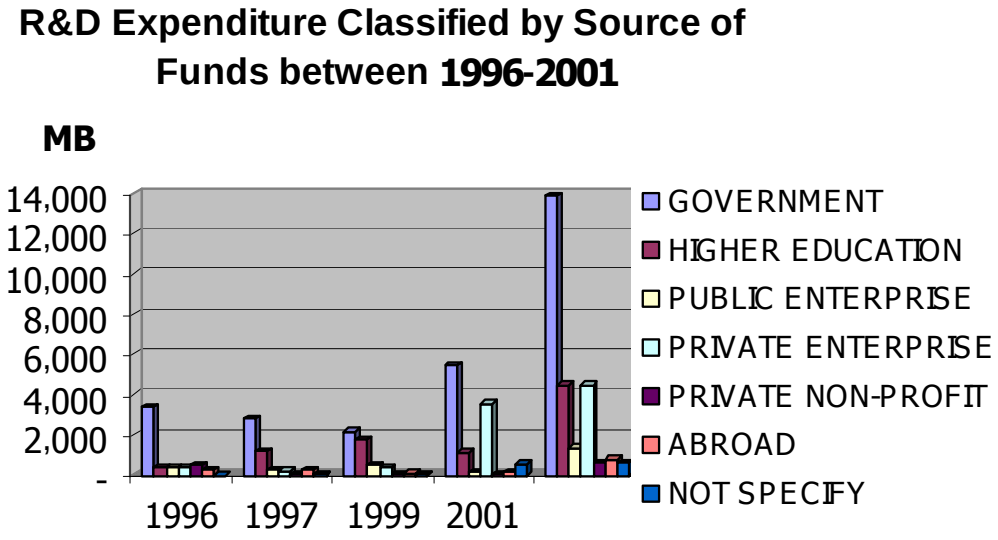


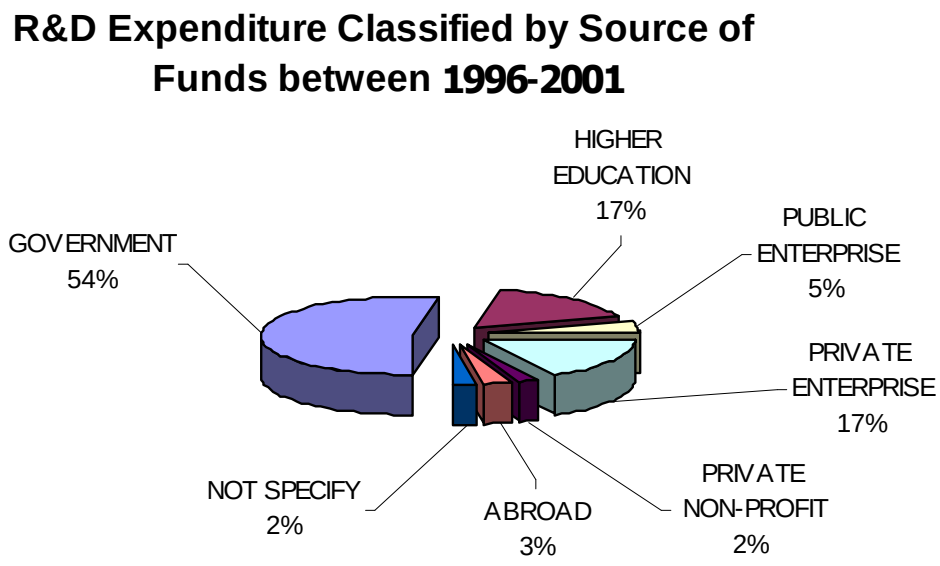
DATA 9: R&D EXPENDITURE IN THAILAND FROM 1991 – 2001



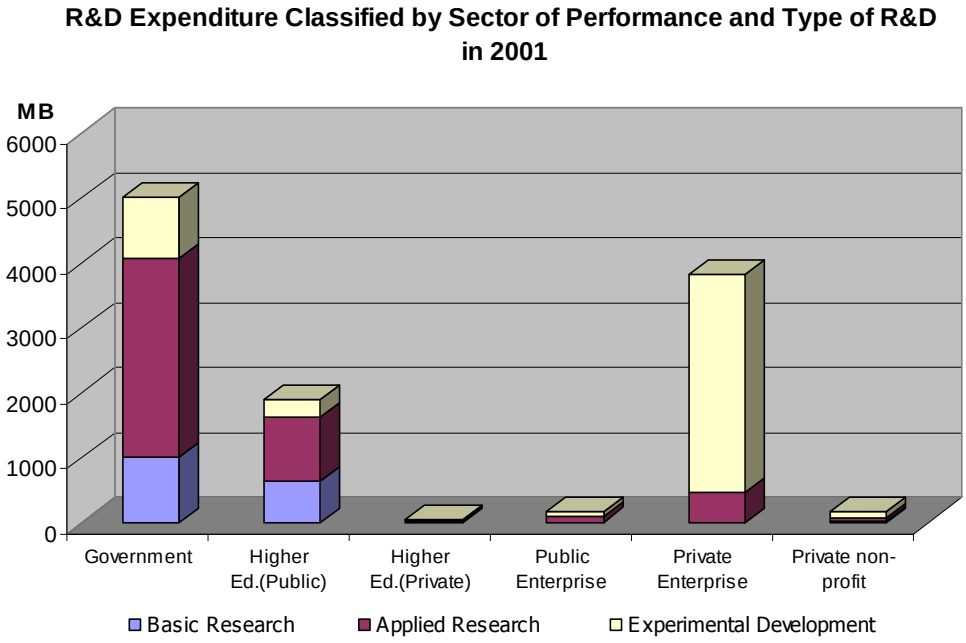


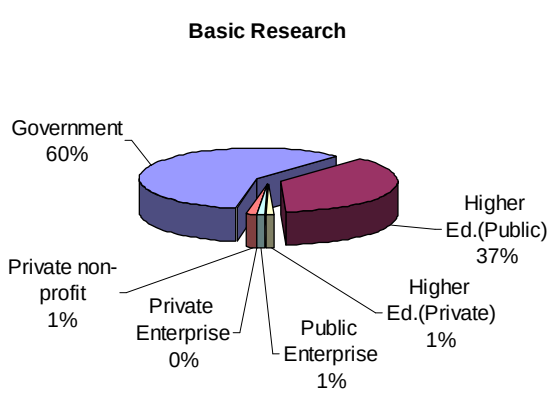
DATA 10: COMPARISON OF R&D EXPENDITURE BY SECTOR OF PERFORMANCE IN THAILAND (1996 – 2001)

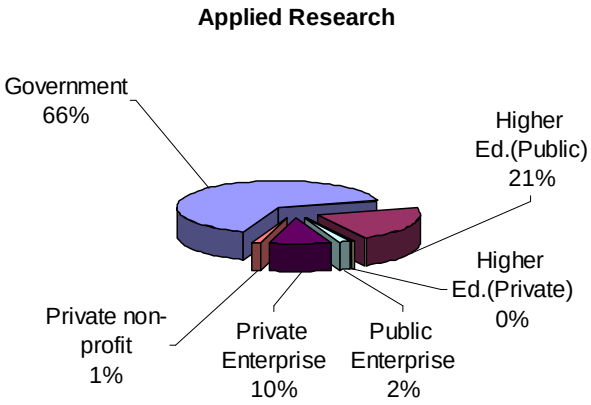


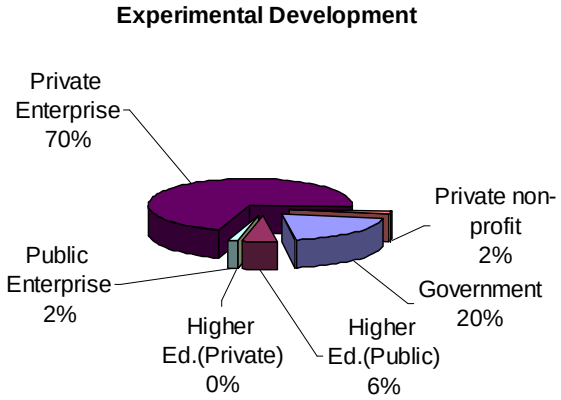


DATA 11: THAILAND'S EXPENDITURE (FROM 1996-2001) CLASSIFIED BY SOURCES OF FUNDS









DATA 12: 2001 R&D EXPENDITURE CLASSIFIED BY TYPE AND BY SECTOR OF PERFORMANCE

APPENDIX B : UNIVERSITY REGULATION ON IP ASSET (EXAMPLE)

The Regulation of Mahidol University
On the Administration of Patents of the University
B.E. 2547 (2004)

For the well-arranged and efficient administration of patents of the University
By virtue of Article 16(2) and (11) of the Mahidol University Act B.E. 2530 (1987), the University Council on its 364 th Meeting on 19 May B.E. 2547 (2004) established this Regulation as follows.

Clause 1:
This Regulation shall be called "The Regulation of Mahidol University on the Administration of Copyrights of the University B.E. 2547 (2004)."

Clause 2:
This Regulation shall come into effect from the day subsequent to its publication date.

Clause 3:
The Regulation of Mahidol University on the Administration of patents of the University B.E. 2544 (2001) is repealed.
This Regulation shall be preemptive to all the regulations, rules, orders, declarations, or other decisions that resemble or are in conflict with it

Clause 4:
Pertaining to this Regulation:

- "University" means Mahidol University.
- "Faculty" includes graduate schools, colleges, institutes, centres, offices, other governmental bodies called by different titles with equivalent accreditation to Faculty, and organizations under the University's supervision with equivalent accreditation to Faculty.
- "Applied Centre" means Applied and Technological Service Centres
- "Patent" includes petty patents
- "Employee" means full-time and part-time employees paid by the income or annual budget of including employees working for the University and being paid by other earnings of the University.
- "University Staff Member" includes full-time, temporary, and part-time staff members paid by income of the University, income of the offices of the University, or subsidies.
- "Student" means Mahidol University student(s)

- "Inventor" means government officials, employees, university staff members, students, research assistants, and those invited by the University to work as advisor(s) or project advisor(s), and those assigned or authorized by the University to work for or observe the operation at the university, and are those who make or originate the inventions, processes, or designs that may be protected under the law on patents.
- Invention" means any innovation or invention which creates a new product or process as well as any improvement of a known product or process that may be protected under the law on patents.
- "Process" means any method, procedure, or process of producing, maintaining, or improving the quality of a product including the application of such process that may be protected under the law on patents.
- "Design" means any form or composition of lines or colors of a product which gives a special appearance to a product and can be served as a pattern for a product of industry or handicraft that may be protected under the law on patents.

Clause 5:
The University shall have the right to file a patent application on Invention, Process, or Design invented by an Inventor working for the University including University advisor or a project advisor or those assigned or authorized to work for or observe that operation at the University as well as those using methods, statistics, or reports obtained by the privilege of being government officials, employees, university staff members, students, or research assistants even though there is no contract of employment concerning the making of such Invention, Process, or Design.
In case there is a research sponsor who holds a contract on the right to an Invention process, Design, or Patent, the issue on right-holding shall be in accordance with such contract.

Clause 6:
Student must sign a letter of consent pertaining to the forms and procedures set by the University assigning the rights to the University to apply for a Patent on Invention, Process, or Design made or originated during the time they study at the University. The said letter of consent may not be revoked and shall exist indefinitely.

Clause 7:
The University shall inform government officials, employees, university staff members, research assistants, advisors, project advisors, and those who perform works under the university's supervision about the University's right on Patent according to Clause 5, and make them sign a letter of acknowledgement pertaining to the forms and procedures set by the University.

Clause 8:
Inventor(s) must not disclose substantial knowledge, information, and details of the Invention, Process, or Design that may lead to the filing of patent by natural or juristic persons other than the University, unless as provided in Clause13.

Clause 9:
The Applied Centre shall be responsible for filing a patent application and shall the following functions:

1. prepare the letter of consent pertaining to Clause 6 and the letter of acknowledgement pertaining to Clause 7 in accordance with this Regulation;
2. assess the commercial value and potential of the Invention, Process, or Design in order to file a patent application according to the law and in conformity with the criteria and procedures set by the President of the University. A committee may be formed to give recommendation and carry out the tasks;
3. act as the coordinator in obtaining, holding, and protecting patents;
4. consider commercializing potential copyrighted works;
5. perform any other duties given by the president of the University.

Clause 10:
In obtaining a patent application, an Inventor shall propose the Invention, Process, or Design together with complete, concise, and clear details that enable a person skills in the art or technology to which it pertains to be able to make or operate the said Invention, Process, or Design known to the Applied Centre.
In case an Inventor fails to present the Invention, Process, or Design to the Faculty he/she works for, the Applied Center must make an enquiry to the Faculty that the Inventor is affiliated with in order to verify that such Inventor has been responsible and has participated in the project. The Faculty must then respond to the inquiry within 15 days of the enquiry date.
In case there are more than one Inventor and each is from different department, the Applied Centre must make an enquiry to every Faculty that the Inventor(s) are affiliated with.
The operation under Clause 10 paragraph one, two, and three must be done confidentially.

Clause 11:
Inventor(s) shall have the duties to submit the factual data on the Invention, process, or Design to the Applied Centre or any assigned person(s) including assist and support the processes on filing of patent application for such Invention, Process, or Design.

Clause 12:
The Applied Centre shall file a patent application under the name of the University for Invention, Process, or Design approved by the University.
In case a patent is obtained in Thailand and the inventor would like to obtain a patent abroad without the University's approval, the inventor may take action on his/her own, in which case, the University shall assign the right to file a patent application under the name of the University to such Inventor.

Clause 13:
For any Invention, Process, or Design that the University disapprove to be filed for patents, the Applied Centre must inform the Inventor within 3 months of the Inventor's request as stated in Clause 10. The Inventor may file a patent application on the Invention, Process, or Design under his/her own name. However the Inventor must not use or refer to the name or symbol of the University unless permitted by the university in writing.

Clause 14:
The Cost of Patent application both in Thailand and foreign countries including costs in acquiring benefits from the patents, in maintaining the patents, and in protecting the patents done by the Applied Center or other related organizations under the name of the University shall be paid from the Fund for Benefits of Applied and Technological Service.

Clause 15:
To promote the creation of copyrightable works, the University shall allocate any benefits received from the utilization of copyrighted works amongst person(s) and organization(s) as follows:

1. the Inventor
2. the University
3. the Faculty
4. the Department

The allocation of the benefits under paragraph one shall be done with the consideration on the use of the resources of the University and in accordance with the regulations and rates set by the University in the form of University announcement. The allocation of the benefits under paragraph one shall be completed within one month of the receiving of the benefits.

Clause 16:
The benefits received by the University pertaining to Clause 15 (2) shall be deposited into "The Funds for Benefits of Applied and Technological Service" in order to support the administration and promotion of works on intellectual property of the university.

Clause 17:
The President of the University shall govern the provisions of this Regulation.

Declared on 31 May B.E. 2547 (2004)
Honorable Professor Natee Rukspollmuang
President of Mahidol University Council

The Regulation of Mahidol University
On the Administration of Copyrights of the University
B.E. 2547 (2004)

For the well-arranged and efficient administration of copyrights of the University
By virtue of Article 16(2) and (11) of the Mahidol University Act B.E. 2530 (1987), the University Council on its 364 th Meeting on 19 May B.E. 2547 (2004) established this Regulation as follows.

Clause 1:
This Regulation shall be called "The Regulation of Mahidol University on the Administration of Copyrights of the University B.E. 2547 (2004)."

Clause 2:
This Regulation shall come into effect from the day subsequent to its publication date.

Clause 3:
The Regulation of Mahidol University on the Administration of Copyrights of the University B.E. 2544 (2001) is repealed.
This Regulation shall preempt over all the regulations, rules, orders, declarations, or other decisions that resemble or are in conflict with it

Clause 4:
Pertaining to this Regulation:

- "University" means Mahidol University.
- "Faculty" includes graduate schools, colleges, institutes, centers, offices, other governmental bodies called by different titles with equivalent accreditation to Faculty, and organizations under the University's supervision with equivalent accreditation to Faculty.
- "Applied Centre" means Applied and Technological Service Centers
- "Employee" means full-time and part-time employees paid by the income or annual budget of including employees working for the University and being paid by other earnings of the University.
- "University Staff Member" includes full-time, temporary, and part-time staff members paid by income of the University, income of the offices of the University, or subsidies.
- "Student" means Mahidol University student(s)
- "Creator" means government officials, employees, university staff members, students, research assistants, and those invited by the University to work as advisor(s) or project advisor(s), and those assigned or authorized by the University to work for or observe the operation at the university, and are those who make or originate any creative works

considered copyrightable works under the law on copyrights.

- "Academic Journal" means journals to enhance knowledge development that published and released academic articles in various fields of study consecutively.

Clause 5:
The University shall hold copyrights of works made by Creator under the employment or order or supervision of the University or within the scope of the functions of the University including works reproduced or modified from copyrighted works, unless otherwise agreed in writing.
Copyrightable works made or originated by Student during the time they study in the University shall be copyrights of the University. In this respect, the University and Student shall make an agreement in writing.
Creator(s) desiring to publish copyrightable works as stated in paragraphs one and two in academic journals, may act on behalf of the University in transferring the right to the publisher by notifying the University within 15 days subsequent to the transferal.

Clause 6:
The creator shall have the right to claim creatorship over and may publicize the works that he/she made or originated under his/her own name; notwithstanding, such publicity shall not be for profit.
In the publicity of the works stated in paragraph one, the University may authorize the Creator to use the name and symbol of the University to publicize such works; notwithstanding, the acknowledgement of ownership of copyright of the University shall be affixed on a part clearly seen.

Clause 7:
The University may, remuneratively or non-remuneratively, license the copyrights to any person in accordance with the law on copyrights.

Clause 8:
For the sake of service provider of copyright data, the University may notify the data on copyrighted work(s) to the Department of Intellectual Property, Ministry of Commerce or other related authorities as well as may reproduce or copy the said works for the University's library, the National Library, and other related authorities for the purposes of further education, research, and reference.

Clause 9:
The Applied Centre shall be responsible for the implementation of copyrights of the University and perform the functions as follows:

6. prepare contracts or agreements related to copyrights;
7. act as coordinator in the process of notification of data on copyrighted work(s) and protection of copyrights;

8. consider commercializing potential copyrighted works;
9. perform any other duties assigned by the President of the University.

Clause 10:
To promote the creation of copyrightable works, the University shall allocate any benefits received from the utilization of copyrighted works amongst person(s) and organization(s) as follows:

5. the Creator
6. the University
7. the Faculty
8. the Department

The allocation of the benefits under paragraph one shall be done with the consideration on the use of the resources of the University and in accordance with the regulations and rates set by the University in the form of University announcement. The allocation of the benefits under paragraph one shall be completed within one month of the receiving of the benefits.

Clause 11:
The benefits received by the University pertaining to Clause 10 (2) shall be deposited into "The Funds for Benefits of Applied and Technological Service" in order to support the administration and promotion of works on intellectual property of the university.

Clause 12:
The President of the University shall govern the provisions of this Regulation.

Declared on 31 May B.E. 2547 (2004)
Honorable Professor Natee Rukspollmusng
President of Mahidol University Council

The Declaration of Mahidol University
on Criteria and Rates for the Allocation of Benefits Arising
from Patented Works for the University
B.E. 2544 (2001)

For the well-arranged and fairness of the allocation of benefits arising from patented works of the University, which would encourage human resources of the University in making more inventions

By virtue of Section 14 of the Regulation of Mahidol University on the Administration of Patents of the University B.E. 2544 (2001), the University established the criteria and rates for the allocation of benefits as follows

Section 1: Pertaining to this Declaration

"Faculty" means including graduate schools, colleges, institutes, centers, offices, other governmental bodies called by different titles with equivalent accreditation to Faculty, and organizations under the University's supervision with equivalent accreditation to Faculty.

"Department" means including governmental bodies or organizations under the supervision of the University called by different titles with equivalent accreditation to Department.

"Net Income" means incomes less cost of notifying patent application and other costs of the Funder, if any, and including incomes from the allocation of benefits among co-owners in case of co-ownership.

Section 2: Where the University files a patent application, the allocation of benefits shall be of the rates as follows

(1.) the Inventor shall receive 50 per-cent of the Net Income

(2.) the University shall receive 30 per-cent of the Net Income

(3.) the Faculty that the Inventor is affiliated with shall receive 10 per-cent of the Net Income

(4.) the Department that the Inventor is affiliated with shall receive 10 per-cent of the Net Income unless the Faculty has no division of Department, this proportion shall be allocated to the Department that the Inventor is affiliated with.

Section 3 Where the Inventors files a patent application on his own by means of Section 12 of the Regulation of Mahidol University on the Administration of Patents of the University B.E. 2544 (2001), the Inventor shall receive the whole Net Income

Section 4 Where the Inventors files a patent application in foreign countries in the name of the University, the allocation of benefits shall be of the rates as follows

(1.) the Inventor shall receive 75 per-cent of the Net Income

(2.) the University shall receive 15 per-cent of the Net Income

(3.) the Faculty that the Inventor is affiliated with shall receive 5 per-cent of the Net Income

(4.) the Department that the Inventor is affiliated with shall receive 5 per-cent of the Net Income unless the Faculty has no division of Department, this proportion shall be allocated to the Department that the Inventor is affiliated with.

Section 5: The University shall place benefits received from the allocation in the Applied and Technological Service Benefit Fund.

This is hereby implemented from the present on.

Declared on 27 July B.E. 2544 (2001)

(signature) Pornchai Matangkasombut
(Professor Pornchai Matangkasombut)
President of Mahidol University

The Declaration of Mahidol University
on Criteria and Rates for the Allocation of Benefits Arising
from Copyrighted Works for the University
B.E. 2544 (2001)

For the well-arranged and fairness of the allocation of benefits arising from copyrighted works of the University, which would encourage human resources of the University in making more copyrighted works

By virtue of Section 6 of the Regulation of Mahidol University on the Administration of Copyrights of the University B.E. 2544 (2001), the University established the criteria and rates for the allocation of benefits as follows

Section 1: Pertaining to this Declaration

"Faculty" means including graduate schools, colleges, institutes, centers, offices, other governmental bodies called by different titles with equivalent accreditation to Faculty, and organizations under the University's supervision with equivalent accreditation to Faculty.

"Department" means including governmental bodies or organizations under the supervision of the University called by different titles with equivalent accreditation to Department.

"Net Income" means incomes less cost of notifying patent application and other costs of the Funder, if any, and including incomes from the allocation of benefits among co-owners in case of co-ownership.

"Benefit Procurer" means the University, the Faculty, the Department, or the Creator that reproduce, modify, publicize, including license the rights to others or rent out the rights of the copyrighted works.

Section 2: For the benefit procuration of the copyrighted works, the allocation of benefits shall be of the rates as follows

(1.) the Creator shall receive 70 per-cent of the Net Income

(2.) the Benefit Procurer shall receive 20 per-cent of the Net Income

(3.) the University shall receive 4 per-cent of the Net Income

(3.) the Faculty shall receive 3 per-cent of the Net Income

(4.) the Department shall receive 3 per-cent of the Net Income unless the Faculty has no division of Department, this proportion shall be allocated to the Department that the Creator is affiliated with.

Section 3: The University shall place benefits received from the allocation in the Applied and Technological Service Benefit Fund.

This is hereby implemented from the present on.

Declared on 8 October B.E. 2001

(signature) Pornchai Matangkasombut
(Professor Pornchai Matangkasombut)
President of Mahidol University

AUTHOR'S NOTE

This paper reports the present IP development in Thailand as an overview one. None of any institutes, including KMITL, have biased the author in any way. The problem in writing this paper is mainly the scarcity of data. There are too many universities with variety of organizations in IP management. Searching for case studies is also very difficult, since they involved with trade-secret and university's reputation. All statistics are not very up-to date but can determine their future tendency in the data presented. And, lastly, the final discussion is solely the author's opinion in fostering better U-I partnership.

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