WIPO/AVI/PH/97/1
ORIGINAL: English
DATE: August 1997

TECHNOLOGY APPLICATION AND
PROMOTION INSTITUTE

WORLD INTELLECTUAL
PROPERTY ORGANIZATION

WIPO NATIONAL WORKSHOPS ON ASSESSMENT AND VALUATION OF INVENTIONS AND RESEARCH RESULTS FOR TECHNOLOGY TRANSFER AND COMMERCIALIZATION

organized by
the World Intellectual Property Organization (WIPO)

in cooperation with
the Technology Application and Promotion Institute (TAPI),
Republic of the Philippines

Bacolod City, August 12 and 13, 1997
Davao City, August 15 and 16, 1997
Manila City, August 18 and 19, 1997

INTRODUCTION TO COMMERCIALIZATION OF INVENTIONS AND RESEARCH RESULTS

Document prepared by the International Bureau of WIPO

TABLE OF CONTENTS

INTRODUCTION

1. Technology and inventions are important parts of the innovation process, which transforms inventions into marketable products. This process is most complex and as such requires much specialized professional expertise and expert knowledge. The marketing and commercialization phase of the innovation process is crucial for the success of any invention and innovation. The returns in terms of profit upon its commercialization are the ultimate proof of the success of any invention or new product.

3. Some of the ways and means to asses and commercialize inventions, will be presented and discussed in this workshop. Together with the Filipino organizers, the Technology Application and Promotion Institute (TAPI) we hope that the participants will have the opportunity to exchange experience and to gain more insight into the complex aspects of the innovation process.

4. This document is not intended as an instruction on how to commercialize inventions, but is intended to present some practical ideas that could serve as a basis for discussions in this Workshop.

COMMERCIALIZATION OF INVENTIONS: THE FINAL STAGE OF THE INNOVATION PROCESS

5. If we look closer at the innovation process we will realize that it consists basically of four overlapping and interrelated main phases: the idea generation and conception phase, the development and design phase, the prototype and pre-production phase, and the production, marketing and commercialization phase.

6. The crucial point in the innovation process is the production, marketing and commercialization stage, when the invention or the new product or process based on it will meet the test of the market. It is only when it is accepted on the market by the consumers and users, that the invention or new product will begin to generate income which will compensate inventors and manufacturers for the investment made and eventually generate also some profit.

7. As it was already mentioned, the returns in terms of profit upon its commercialization are the ultimate (and eventually the most important) proof of the success of any invention or new product.

8. The innovation process is not a linear process and its different components overlap and interact in a considerable degree. Thus the commercialization and marketing of an invention could be initiated at a very early stage of its development, e.g. already during the idea generation and conception phase. However, for the inventor or his company it is not advisable to begin commercialization at such an early stage and at least not before having filed a patent application. The price someone could offer for such an inventive concept would be very low, if any, regardless of its ingenuity and market potential, since a lot more of development work will have to be done, before the invention may be used in practice and could generate any income.

9. An illustration of this is the invention of xerography, which is the technical basis of the copying machines. It took the Battelle Northwest Laboratories in the USA more than ten years of R&D work and several hundred thousand dollars of investment to develop a marketable copier after the invention was made and its feasibility proven. And only then began the marketing based on the vast distribution network and experience of the Rank organization.

10. A common mistake of many inventors is that they try to sell their invention without taking the necessary steps to at least obtain legal protection and to develop the inventive concept into something more tangible, e.g. to file a patent application and to produce a working prototype before trying to commercialize it.

11. One should always remember that from the point of view of commercialization inventions have many properties in common with any other commodity or product, the main difference being that unlike material goods, inventions can be used simultaneously by several persons and hence they can be sold or licensed several times, to different persons.

12. Inventors and all those involved in marketing inventions and innovations should not forget that only a very small percentage (5 to 7 percent) of all inventions for which patents have been granted reach the commercialization phase of the innovation process. The great percentage of failure is usually not due to the quality of the invention, but rather the result of the influence of other factors, such as, for example, the high investment cost for a relatively small effect, need of additional R&D work, the manufacturing and technological environment are not yet ripe for such invention, no real market need, etc. But the history teaches us that that will not stop creative people from inventing and trying to commercialize their inventions. Inventors are usually very optimistic persons who are always confident that their inventions will sell, and will generate an important income for them.

13. Commercial and marketing strategies will largely depend on the kind of invention and the field of technology, to which it is related. They will be different for a mass product and for an invention in a specialized field, applicable only in the production of a few manufacturers. The market environment, the customs and traditions, the purchasing capacity and power of people (consumers) in the area will to a large extent define the methods and approaches.

14. Commercialization and marketing of inventions is a most complex process and in a highly competitive market it needs a professional approach and a lot professional expertise in order to have chances of success. Inventors are advised to seek as much as possible professional expert assistance when they are involved in that process.

15. There exist many publications that teach strategies and techniques on how to sell and commercialize products, and all of them always underline that there can be no fixed rule on how to commercialize or market a product, although certain guidelines are common and basic and are important to remember. The same applies even more to inventions, which by definition are not standard products.

17. Successful marketing of inventions and technology means to marry a new invention to a real existing need. It demands an extensive and very close collaboration and cooperation between three groups of people: those who create inventions and technology, those who explore and create markets and those who use inventions and technology.

18. From the viewpoint of the inventor or invention owner there exist a few possible ways for commercializing inventions:

- to start own manufacturing and marketing the product based on the invention,
- to license the rights in the invention,
- to sell the patent rights, or
- any combination of the above.

19. The decision which way to choose will depend on a variety of factors, among which the cost and benefits analysis will often be decisive.

20. The income an invention may generate will depend directly on the investment made for its development and marketing:

- the highest return (or benefit) for the inventor may be expected when he decides to start its own production based on the invention, but this approach will require also the largest investment;

- the benefit for the inventor will be much lower when he decides to license or even to sell his patent rights at an early stage of development of his invention.

21. Each individual case should be analyzed and evaluated accordingly, taking into account the nature and properties of the invention, the needs, conditions and potential of the market, the resources available, and last, but not least, the willingness of the inventor to cooperate in further development of the invention.

22. Well prepared business plans and convincing prototypes are indispensable for attracting investors, manufacturers and potential users.

23. Patent protection, if available and strong enough, can be a very powerful tool in the commercialization process, in particular on foreign markets.

24. Usually commercialization should begin on a local scale, close to the user and only upon success one should embark on large scale commercialization and marketing (including also for export in foreign countries).

25. The possible license partners or buyers for an invention may be approached in different manners, such as, inter alia, direct contacts with companies, contacts through Chambers of commerce and industry or similar organizations, contacts through professional or industrial associations, by participating in specialized exhibitions or by using the services of an invention broker. It is advisable that all contacts should be carefully coordinated and monitored by establishing a public relations plan. The commercial success of an invention will depend largely on a reliable and dynamic partnership.

26. Today, besides the creators of technology (inventors, R&D centers, universities) and the user of technology (industry, the business community and the consumers), the entrepreneur (broker, finder/creator of markets) has an increasingly important role in the commercialization and transfer process.

27. In some cases, in particular in developing countries, governmental agencies could also act as brokers or promoters of inventions, however, such institutions should not be a part of the governmental or administrative system, but should rather have an independent status with respect to business decisions.

28. Inventors often entrust the search for partners and the commercialization of their inventions to commercial brokers. Before entering such arrangements, however, inventors should obtain as much as possible information on the activities and experience of the commercial broker and ask also for references from other, independent sources. It is advisable that inventors retain the rights in the invention (patent, industrial design or utility model registration, trademark registration) and agree with the broker on a commission to be paid to him upon accomplishment of the task.

29. Practice has shown that in order to be successful in the commercialization or marketing of inventions, the inventor of his company will need to have access to several or all of the following services:

- technical and technological evaluation of inventions and innovative projects,
- economic evaluation and market studies (i.e. feasibility studies),
- legal advice and assistance,
- contacts with potential users,
- experience in business negotiations,
- contacts to mobilize and attract seed and start-up capital or venture capital,
- assistance in obtaining industrial property titles, including patenting of inventions or registering trademarks,
- assistance in publicity matters and preparation of public relation campaigns,
- advice and assistance in prototype manufacturing, etc.

30. In several countries associations of inventors provide inventors with expert assistance on the different aspects of commercialization of inventions such as written information on general and specific business practice and ethics, information on the economic, financial and other laws and regulations affecting commercialization, technological information, guidelines and other materials, including lists and addresses of experts in the various fields, such as patent practitioners, patent lawyers and invention brokers.

31. The Annex to this document contains a non-exhaustive checklist of suggestions and questions, which may facilitate taking decisions at the different stages of the development, marketing and commercialization of inventions, innovations and new technologies. We would welcome any suggestions for amendments or changes of the said checklist.

HOW TO APPROACH COMMERCIALIZATION: PLANNING - WHAT & WHY

32. Commercialization planning differs from business planning. These two types of plans are appropriate at different stages of the innovation process, and serve a different purpose.

Commercialization planning employs different assomptions from business planning and is appropriate early in the innovation process, rather than later.

33. Commercialization planning helps the inventor/innovator to understand the overall commercialization process. It helps developers to deal only with the issues that must be confronted early in order to succeed.

Commercialization planning employs different assumptions from business planning

34. Formal business planning in the commercialisation process is based on two important assumptions. First, it assumes the inventor/innovator has decided to start or expand a business based on new product development. Second, it assumes a product or even a product line has been defined.

35. Commercialization planning helps the inventor to identify potential applications and markets (as opposed to designing the final product). It helps get planning accomplished early when formal business plans would require unrealistic “guesstimates”. It does help to design a prototype that may provide information that will be needed in order to design a product for sale later on.

36. During the early stages of the innovation process strong constraints are identified. Collecting information for the decision-making process is more important than forecasting the exact consequences that may result from the decision. Thus, commercialisation planning seeks to examine all of the possibilities.

37. Commercialization planning follows research and is applicable to robust technologies that may have many applications in more than one industry/product. It is also applicable to technology that may have only one good application.

38. It may, in fact, reveal that the inventor hasn't identified any good application at all. It may be better to reinvent the concept than "beat on a dead invention". It helps sort and identify priorities concerning what needs to be done to pursue the applications with the highest potential.

39. Commercialization planning is appropriate for sorting and prioritizing resaarch results. It facilitates engineering applications analysis by bringing industry and market issues into the decision-making process early.

40. It is not feasible to fully describe in this presentation all details of the commercialization planning process. However, one should keep in mind that any commercialization plan will progress from a simple description of the project (not just the technology, but the whole project) including information on management, marketing strategy, and resources required for development.

41. As the development advances through the innovation process, however, more knowledge about the market will become available and the plan will change to reflect that increased knowledge. Commercialization planning is a continuons dynamic process that, ideally, never stops.

42. One day, months and years later

Your old plans will seem to your business as snapshots seem to your childhood.

43. The commercialization plan will ultimately include detailed discussions of the project, the product and the market.

44. The detailed discussions will contain more accurate values for key costs, prices, etc. These values don't have to be precise.

THE PATENT SYSTEM AND COMMERCIALIZATION OF INVENTIONS

45. In the highly competitive environment of international trade, increasing importance is being placed on planning and forecasting, and the development of appropriate commercial and industrial strategies on the part of individual enterprises, industrial groupings, and even countries. Such strategic planning is an increasingly important part of the successful implementation of the product and marketing policy of individual companies, and of the establishment and development of a technological base which is appropriate to the capacities and opportunities of the relevant country.

46. Recently, increasing attention and importance has been given to the role of the patent system as an analytical instrument for such industrial planning and decision-making. Two main uses of the patent system may be of interest in this regard.

47. First, the information aspect of the patent system: Awareness of the state-of-the-art in a particular technical field can avoid duplication in research work by indications that the desired technology already exists. Also it can provide ideas for further improvements; and can give an insight into the technological activities of competitors and, by reference to the countries in which patents have been taken out, the marketing strategies of competitors. A state-of-the-art search can also identify newly developing areas of technology in which future R&D activity should be monitored.

A state-of-the-art search can identify newly developing areas of technology

47. And second, as a tool for industrial planning and strategic decision making, the industrial property system may be very useful through analyses of the statistical aggregation of patenting activity as revealed through published patent documents. Since the degree of patenting activity provides an index of the degree of technological activity in a given technical field, the statistical analysis of patent documentation can indicate which countries or companies are active in various fields, in which industries technology is moving at a rapid pace and in which the technology is stable, and which are the enterprises active in particular technical fields. Such analyses provide a means of forecasting future industrial developments, identifying areas in which market demand is increasing, monitoring general technological progress, and testing the soundness of policy and investment decisions.

48. Technology, and inventions, as a fundamental part of it, are, by nature, both private goods in creation and public goods in productive use or consumption. They are private goods in so far as their creation consumes both mental and physical resources which are thereby diverted from other production or consumption activities. Once technology or inventions become available in the form of information, however, they lose their characteristics as private goods. Unlike a tangible object, they can be used by many without loss to any person, and without further investment in re-creating it for new users.

49. These characteristics of technology and invention create a dilemma. If all are free to use technology and inventions which have been created, who will be willing to bear the cost associated with their creation? One of the basic rationales of the patent system is to provide such an incentive for the creation of new technology and inventions. It does this by offering to inventors exclusive rights to commercially exploit patented inventions for a limited time in return for the disclosure of the inventions to the public.

One of the basic rationales of the patent system is to provide an incentive for the creation of new technology and inventions by offering inventors exclusive rights to commercially exploit patented inventions for a limited time.

50. The exclusive rights to exploit the invention commercially permit the creator of the invention to work it without fear of interference from imitators who have not incurred the investment in research and development which produced the invention. The inventor will thus have the opportunity to recover research and development costs through the competitive advantage which the exclusive rights to exploit the invention confer. The patent grant in this respect acts as an instrument of economic policy to stimulate further risk-taking in the investment of resources in the development of new products and technology.

51. Patents are granted on technical criteria and not on the basis of commercial or market criteria. The exclusive rights which are conferred by the patent relate to the commercial exploitation of the invention, and do not preclude another person from experimental work using the technological information contained in the patent specification. In other words, while the patent owner can prevent others from using, for commercial purposes, the same technology as is revealed in the disclosure of his invention, he is not protected against those who derive from his disclosed invention a perception of a market need which may be satisfied by the legitimate adaptation or improvement of his technology, or through the discovery of a different technical solution to satisfy the same market need.

52. The patent system contributes to economic growth and development by creating the conditions for the marketing and commercialization of inventions in several ways:

(a) it gives an incentive to the creation of new technology which will result in, inter alia, new products, inventions and commercial opportunities;

(b) it contributes to the creation of an environment which facilitates the successful industrial application of inventions and new technology, and the legal framework which encourages investment, including from foreign countries;

(c) it acts as a catalyst for the commercialization of inventions and their transfer to productive use;

(d) it is an instrument of commercial and industrial planning and strategy.

53. The framework of the patent system also provides a necessary element of certainty for a technology transfer transaction. If a potential technology recipient were located in a country which did not maintain a patent system, the supplier of the technology would need to rely on purely contractual arrangements seeking to guarantee non-disclosure and use of the invention by third parties. Such arrangements establish an element of commercial risk for technology suppliers which is more pronounced than in circumstances where the transfer transaction can be linked to a patented invention or technology guaranteeing protection against illegal exploitation by third parties.

54. The existence of a patent also introduces another measure of certainty to the commercial transfer transaction by enabling the potential recipient of the technology to sight the essence of the technology which he is wishing to acquire. In the absence of a patent, such initial sightings of the technology which it is proposed to transfer must take place through disclosures under secrecy and confidentiality agreements, which can again introduce an element of commercial risk of the leakage of the technology to third parties, thus undermining both the value of the technology from the point of view of the supplier, and the value of the technology for which the recipient will be paying. Furthermore, to cover such high risk the supplier would calculate it into a higher price of his technology.

55. The patent system must be understood as a policy instrument which encourages developing indigenous technological capabilities by providing an incentive to local inventors, research and development organizations and industry, rather than a policy instrument which, if adopted, will immediately effect a transformation in the level of technological sophistication in the relevant country. In fact, it represents a strong shield for the development of innovative domestic industry however small it may be at the moment.

56. The patent system does not constitute an instant remedy, but rather a long-term infrastructure investment in development of the national market. Without any patent system, inventors, entrepreneurs and companies would have no effective protection against the imitation of their inventions, and less incentive to invest in the development and strengthening of their technological capacities. It might therefore be expected that the number of inventions produced by local inventors would be even less in the absence of a patent system.

INFORMATION ASPECTS OF THE PATENT SYSTEM AND MARKETING AND COMMERCIALIZATION OF INVENTIONS

57. Historically, patent protection was introduced as an economic policy instrument through which foreign skills and expertise could be attracted to a domestic economy by the grant of exclusive rights to work a particular skill or trade which was not present, or was

underdeveloped, in the domestic economy.* The modern patent system continues to play an important role in the commercialization, marketing and transfer of technology.

58. The patent system plays an important role in the process of matching technology suppliers and recipients. In addition to the valuable technological information, a published patent document contains details of the names and addresses of the applicant, patentee and inventor, and thus provides a means whereby the owners of rights in relation to technology may be located.

59. The patent system stimulates invention and innovation through the accumulated pool of technological information contained in patent documents: the technology disclosed in patent documentation may serve to stimulate ideas for further invention and innovation.

60. The accumulated store of information which is contained and classified in patent documentation constitutes the single most valuable and comprehensive source of technological information available in the world today. As a source of technology and commercial and legal information, patent documentation has a number of distinct advantages:

(a) the technology contained in patent documents is, by definition, new industrial technology. It is a condition of the grant of a patent that the invention for which the patent is claimed be new, workable and capable of industrial application;

(b) patent documentation contains both a historical record of the evolution of a particular technical field, and a record of the most recent advances in that field;

(c) patent documentation also contains an extensive range of technological information which has not been published elsewhere; Such technological information would appear in traditional information sources much later than its publication in the application or the patent;

(d) a further advantage of patent documentation as a source of technology is that it is usually published in a uniform structure and form, which typically includes a summary of the invention, a description of the invention and how it differs from the prior art, and, of course claims, that define the scope of the invention. Very often it contains also drawings and an abstract of the invention to facilitate easy reference;

(e) additionally, patent documentation is usually classified in such a way as to enable a searcher to retrieve documents belonging to any given field of technology, thus facilitating comprehensive access to sources of technology in that field;

(f) patent applications and patents contain the full names and addresses of the inventors, applicants and patent owners (patentees), and thus provide a means for identification of the owners of rights in relation to technology;

(g) patent documents provide information on the state of protection of a given technology or invention.

---

* [1] See F. Beier and J. Straus, *The Patent System and Its Information Function - Yesterday and Today, International Review of Industrial Property and Copyright (1977, 8) p.p.387 - 406.*

61. Analyzing patent applications or patents for the same invention in different countries will permit conclusions concerning the commercial interests of the patent owner.

62. As already mentioned, the effective searching of patent documentation can indicate the state-of-the-art which exists in relation to any particular field of technology, which will be of particular importance to the individual enterprise. Awareness of the state-of-the-art in a particular technical field can avoid duplication in research work by indications that the desired technology already exists. Also it can provide ideas for further improvements; and can give an insight into the technological activities of competitors and, by reference to the countries in which patents have been taken out, the marketing strategies of competitors. A state-of-the-art search can also identify newly developing areas of technology in which future R&D activity should be monitored.

63. The aforementioned advantages characterize the information which is available through the patent system as an extremely valuable and comprehensive source of commercial and technological information, which can be used directly for scientific and experimental purposes and as a basis for stimulating the adaptation and improvement of the technology described in patent documents immediately after its publication, provided the user has the necessary basic and specialized knowledge.

64. It should be noted that the information contained in patent documentation provides merely the skeleton of a particular technology, and needs to be supplemented from other sources in order to represent a functional body of technology. In every case the raw source of technology disclosed in a patent specification is supplemented after the grant of a patent by know-how derived from the accumulated experience of the use of the invention.

[Annex follows]

NON-EXHAUSTIVE CHECKLIST OF QUESTIONS THE ANSWERS TO WHICH WILL HELP EVALUATING INVENTIONS, INNOVATIONS AND TECHNOLOGIES AND FACILITATE TAKING DECISIONS AT THE DIFFERENT STAGES OF THEIR MARKETING AND COMMERCIALIZATION

1. What is the state of development of the invention or technology?

2. What is the state of legal protection of the invention or technology?

- no protection,
- patent application filed in home country, (when)
- patent applications filed abroad (where and when),
- patent granted in home country (when),
- patents granted abroad (where and when),
- patents abandoned (where, where and why).

3. Who is handling the patent applications and other industrial property matters?

- in-house experts,
- outside professionals?

4. How reliable is the patent protection in the home country and in the foreign countries, where applications have been filed or patents granted?

5. Who are the potential users of the invention?

- manufacturing enterprises,
- the general public,
- specialized end users,
- other.

6. What would be the expected economic effect and other benefits of using the invention for the future user or customer?

- list the advantages compared to existing products or technologies.

7. What financial resources (risk capital, especially seed and start-up capital) exist for

- developing the invention,
- obtaining patent protection,

- manufacturing and marketing of the products, etc.?

8. Which way of commercialization will be chosen?

- own manufacturing and marketing of the products,
- granting an exclusive license to one partner,
- granting several non-exclusive licenses,
- selling the patent rights.

9. How big or how small to begin? What will be the cost of introducing a new product on the market? What is the minimum profitable volume of production?

10. Are there similar products in the market? If yes, would consumers rather buy the competitor's products than yours because they are better in quality and more practical for the purpose than your invention?

11. Who are the competitors and what is their market position?

12. Do you envisage using a trade mark?

13. Will the marketing be done with own resources or will it be commissioned to some professionals?

14. Will commercialization of the invention begin in the home country (local sales) or will it start at a larger scale in other countries (i.e. exporting the products of the invention)?

15. If participation in specialized exhibitions (including inventors' exhibitions) is envisaged, what are the objectives? Who will be the clients to be met?

16. Should the commercialization of the inventions be entrusted to commercial brokers? What are the advantages offered?

[End of Annex and of document]