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IP SERVICES OF INNOVATION CENTERS, TECHNOLOGY
LICENSING/MANAGEMENT OFFICES OF UNIVERSITIES, INCUBATORS, AND
SCIENCE/TECHNOLOGY PARKS TO RESEARCHERS, INVENTORS,
ENTREPRENEURS, START-UPS AND SMEs: EXPERIENCE OF FINLAND

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Inventions and innovations are in many countries the cornerstones of successful competitive products and business reforms. The new ideas may come from the needs of markets from customers, from university research, from development workers "out of the blue".

Very few ideas are ready from the start - inventions must be developed into marketable products. During their early life, inventions must be taken care of, just like plant seedlings, to allow them to grow and develop. Particularly in the ideation and development phase, several projects should be underway simultaneously, because all of them will not be successful. After several phases, many inventions - but by no means all of them - can be converted into finished products that are taken into production and marketed. The development phase requires plenty of creative effort, know-how and financial resources, for which outside expertise is usually needed.

First assistance in developing an idea into a product for business is often received from Innovation Centers (or Innovation Foundations or similar innovation support organizations). Start-up or spin-off companies begin their activities often in incubators, which often are located in or are part of technology parks. For licensing purposes in many universities there are Technology Transfer Offices or similar cooperation organizations.

INNOVATION CENTERS

In many countries the government has decided to support the development work of inventions. This support includes often in addition to advising and consultancy work also financial support to cover part of the development costs of the invention. The organizational models vary. Often an Innovation Center or Foundation is established. It may have offices in different parts of the country. Sometimes the work is made in a technology center or linked to a university. It may also be a part of some ministry or other governmental organization. It is also good if private organizations or funding possibilities are linked to the Innovation Center.

The main tasks of the Innovation Center or Foundation may include:

- Promotion and communication of innovative activities.
- Advising and evaluation of inventions.
- Advising and assisting in intellectual property rights, mostly patenting.
- Assisting in the project management and product development, for instance in building prototypes.
- Advising in marketing and commercialization of the innovative new products.
- Financing partly or fully of the patenting, product development and commercialization costs of an invention.

The work of the Innovation Center may also include

- Advising work for the establishment of new enterprises.
- Incubator activities for start-up companies or cooperation with technology parks.
- Participation or cooperation with venture capital activities, especially in the early phase seed financing.
- Educational or training activities for inventors and entrepreneurs.
- International cooperation and business contacts.

STARTING THE INNOVATION CENTER

The legal form, financial resources and the size of the Innovation Center may vary. The start of an Innovation Center may be modest, first 2 – 4 persons and a board representing the interest groups. The director and the staff should be experienced in patenting and other intellectual property rights as well as product development and marketing. Some legal expertise and officer routines are also needed. The offices should be equipped with modern information technology including Internet connection to data banks related to patenting and marketing. The possibility to finance invention development costs is recommended, because then it is possible to get the inventions fast to the market.

Anyway, it is essential that it is a confidential service organization where inventors and entrepreneurs can get assistance in the field of innovations and that it is a cradle of new business opportunities and successful innovations. Another important principle is that an Innovation Center needs time and patience – the results will come slowly.

Innovation Center and the Development of an Invention into a Product

Innovation Centers assist inventors, innovators and entrepreneurs in many ways, when developing the inventions from idea to a marketable product using, for example, the following phases and means:

- Patent, technical and marketing information related to the invention is collected and then the invention is evaluated.
- The results of the evaluation are reviewed.
- The inventor/owner of the inventions submits a patent application to the Patent Office possibly with the assistance of a patent agent, and the appropriate international patenting is dealt with in good time.
- A plan for implementing the project is drawn up.
- Product development, further research or a prototype is produced for further evaluation, testing and for the commercialization.
- The characteristics of the invention are tested (a check is made to see whether it meets, e.g., the quality and safety requirements set for the product) and new prototypes are made if necessary.
- A business plan is drawn up with the focus on the commercialization of the invention (market surveys, marketing material etc.) as well as on human and financial resources
- The invention can be manufactured and marketed either as the current or new company's own production or a license agreement on its commercialization can be concluded with a company in the sector.
- The marketing and manufacturing of the innovative product starts by different means to companies or other customers often first domestically and later on internationally.

It is good to remember that exploiters and buyers are generally more interested in the competition situation and commercial possibilities or success than in the idea itself.

ADVICE AND EVALUATION OF INVENTIONS

An Innovation Center must possess considerable expertise in advising on matters relating to the evaluation and development of inventions, their patenting and related strategy as well as in marketing. As far as possible within resources, the Center also offers general advice by telephone. The most common questions The Innovation Center is asked are

- I have an invention, is it an invention?
- What is a patent and how do I get it?
- What are the invention development phases and costs?
- How and from where can I get financing?
- Can you help me in marketing?
- How much do I learn, will I become a millionaire?

There are some general principles to inventors, who think they have made a feasible invention:

- Do not present your invention publicly (at fairs, in the media, in articles) before the patent application. This is very important especially for researchers.
- Assess the advantages, topicality and market-worthiness of the invention: what problem does the invention resolve, how can it be made into a product and who needs it.
- Investigate novelty and patentability.
- Evaluate the technical solution, effectiveness, economicalness, costs and funding and manufacturability compared to competitors on the market.
- Determine the ownership of your invention.
- Approach advisory, assessment and financing organizations at a suitable stage (the Innovation Center).

At this stage already, the inventor should make a full checklist and plan for his invention: customers, requirements, technical development stage, novelty and patents situation, funding, manufacture, who would be responsible for directing the project, sales, the potential for an employment-related invention, description of product idea and presentation material. A business plan should be made already in an early phase and updated during the development of the project.

It is a good idea to remember that financiers often assess the inventor's personal chances of turning an idea into a product for the market. The way in which the idea is presented is also very important.

A good idea, invention or innovation and related products may be recognized in advance by the following earmarks, which usually are the main evaluation criteria of an invention to be developed and eventually financed.

- The product is market driven; it is in demand.
- The product is inventive, novel, and patentable.
- The product is significant to the business and to employment.
- The product is functional, capable of being produced and economical.
- The product has a suitable level of technology.

- The product can be launched quickly.
- There is personal or organizational commitment behind the development project and the product.
- Investors are interested in the venture.

It is important to find out the good and promising inventions already in the early phase and finance their development. Only the good inventions will get more public or private funding or investments later on.

The evaluation of the market potential is a key factor during the entire product development phase. As the process approaches the commercialization phase, the focus shifts to marketing and commercialization tasks.

The Center can also consult outside experts for evaluating invention proposals. The experts are primarily from universities and research institutions, and abide by the confidentiality, which must be principle of the Innovation Center.

BENEFITS OF PATENTING

The Innovation Center provides expert assistance for the protection of inventions, usually by means of patenting.

A patent gives the inventor the right to decide the fate of his or her invention. The inventor may manufacture and sell the product himself or may assign his right to someone else.

The legal protection afforded to intellectual property has commercial significance to the owners since the owner may, for instance, preclude others from taking advantage of the protected intellectual property in their business. Businesses – manufacturers, merchants, etc. – need to, in fact, establish a name or brand for their products so that customers can tell them apart from other products. Likewise, an inventor must secure an exclusive right to his invention, a patent, so that not just anyone can exploit the invention in his or her business.

In a Finnish research study, businesses gave the following reasons as the most important rationales for their patent interest:

- Securing the basis for continued manufacturing operations.
- Utilizing patent publications in product development.
- Pre-empting competitive market entry.
- Using a patent in marketing.
- Monitoring competitors by following patent publications.
- Avoiding patent infringements and disputes.
- Evaluating the level of technology in an industry.
- Using patents as a medium of exchange.
- Licensing agreements.

Components of the benefit – usually economic – derived from important patents include:

- Pre-eminent market position.
- Pre-empting competitive entries.
- Pricing flexibility with new technologies.
- Quick payback period for investments.
- International expansion.
- Strategic patent alliances.
- Patent ownership as an advantageous negotiating tool.
- Breathing space afforded by patent protection.
- Favorable image.

The protection afforded to the inventor or inventor organization by a patent is an indisputable advantage, which does, however, require some expenditures. A patent provides a head start on the competition; even from the secrecy point of view 18 months. Filed patent applications can also be used to intimidate competitors through, for instance, corporate communications. Patents serve as flexible instruments of trade through licensing and sub-licensing and thereby open opportunities to earn substantial income and to expand internationally. However, in case of disputed patents must be vigorously defended.

PATENT INFORMATION SOURCES

Patent databases function as a vast source of information for inventors and businesses that wish to find the latest technology in their field or are trying not to infringe on competitors' patents. Some of the patent information is not free of charge. Aside from databases available in most Patent offices, a considerable amount of patent information may be found also on the Internet, for instance

Home pages of local patent offices

- www.wipo.int (WIPO, also classification)
- <http://ep.espacenet.com>, (EPO)
- www.uspto.gov, (US Patent office)
- www.delphion.com (former IBM, charge)
- www.rupto.ru (Russia)
- www.jpo.go.jp (Japan)
- www.surfIP.gov.sg (IPO Singapore, charge)
- www.derwent.co.uk (service company, charge)

Patent information is available as printed material and nowadays electronically, which is very practical. It is possible to make search in many ways for instance by filing or publication numbers, applicants, inventors, references, International Patent Classification (IPC), keywords or by combinations of above.

Patent documents give a lot of information especially

- For novelty research and protection
- For information and technology assessment

Additionally, patent documents give valuable information for instance in:

- Inventions in different countries and fields according to the classification (IPC)
- Both history of technology and the latest inventions in each field (the application is published after 18 months of filing)
- Information of inventors and applicants and also historical data of them.

With the information of the patent documents it is also possible

- To avoid R&D projects for inventions which already exist
- To add the level of technology in different fields and countries
- To make new inventions as improvements to existing patents
- To find inventions which can be licensed
- Follow patenting activities of competitors or other companies
- To follow inventions which may be near or infringe existing or your patents
- To consider new business opportunities

The costs of the use of patent information vary remarkably. The costs depend on time that the researcher uses and the costs of the use of Internet and databases. Additionally, it may sometimes be advisable to use a consultant or information service if there are no own resources available because of time or the field of research. Also big savings can be reached by avoiding investments in wrong research or development projects.

PRODUCT DEVELOPMENT

In the product development phase the idea or invention is made concrete by design and by making a prototype and testing and improving it. The work is done in a prototype workshop, which can be part of the Innovation Center. It produces observation models and develops, builds and tests prototypes. The plans are made confidentially in collaboration with the inventor. The prototypes and their testing can also be commissioned elsewhere, for example, at institutes of technology, universities or private confidential workshops.

MARKETING AND COMMERCIALIZATION

The Innovation Center provides assistance to the inventor in the marketing and licensing of inventions, but the right to exploit an invention belongs to its owner. The most common exploitation alternatives include:

- Production with current or new enterprise.
- Licensing.
- Partnership arrangements.
- Acquisitions.

The inventor may start a company to manufacture and market his or her invention. If the inventor-entrepreneur exploits the invention himself, the patent need not be as strong as when the invention is licensed to someone else. It is not always wise, however, to build a company around one product, and a good inventor will not always make a good entrepreneur.

Networking, on the other hand, often produces good results by providing access to the best available innovation, financing, manufacturing and marketing expertise of individuals or smaller companies. Patents also have value as capital, which may be exchanged for equity in an early formed company.

The industrial and commercial implementation of invention projects is promoted by the various methods of marketing and marketing communication. New products or inventions after a patent application are represented to entrepreneurs by means of direct marketing or at innovation or sector fairs and other business events or via the various media. The Center can also have printed lists of marketable inventions or Internet can be used.

The Center can also help the inventor with establishing links and with contractual issues with both domestic and foreign businesses. In the Innovation Center is located near a university, it can also take care of the university's technology transfer activities or cooperate with the university in commercialization of university inventions.

The customers of the Center can obtain contractual and legal assistance in negotiations aimed at exploiting an invention, for instance by using a license agreement.

Inventions can be commercialized by many different means depending on whether the goal is to enter into a licensing deal or market and sell a finished product. These means include:

- Direct personal and phone contact with manufacturing and marketing companies.
- Licensing notices and offers through e-mail, fax, letters and booklets.
- Demonstrations, such as prototypes, test results and videos.
- Electronic market places and networks, such as
 - www.innofin.com (Finland, free)
 - www.yet2.com (International, charge)
 - www.invention-ifa.ch (inventors associations)
 - www.lesi.org (LESI)
 - www.tii.org (TII)
- Commercialization projects.
- Marketing and legal consultants.
- Trade fairs, exhibitions and matching and partner search events.
- Conferences and lectures
- Cooperative research projects and technical and scientific publications
- Advertising campaigns
- Other media, including radio and television.

In the case of licensing, initial contact should lead to negotiations. Thorough preparation is essential. The likelihood of success in these discussions can be increased by assembling the appropriate negotiating team, along with expert advisors, making sure that the negotiations are carried out at the proper organizational level, and that team members are well informed about the topic and know the backgrounds of their counterparts. A new and fast growing alternative distribution channel for marketing and selling finished products can be found in the Internet and electronic commerce.

Small and medium -sized technology enterprises usually have limited resources at their disposal and therefore focus on the essential that is production and marketing. Their corporate and product development, therefore, should be based on the acquisition of product ideas, research information and know-how that is as ready as possible to be applied by the enterprise.

An agreement is usually reached when all parties benefit from the deal.

FINANCING OPPORTUNITIES

The patenting and development of inventions into marketable products may be expensive. That is why it is recommended that an Innovation Center can provide support funding to inventors.

Support funding is generally used for paying the costs of

- Patenting
- Product development
- Prototypes
- Commercialization and
- Legal matters.

The funding may be in a form of grant, support funding, loan or guarantee. In a subsidized risk financing model a conditional refund to the Center depends on the success of the project and on the revenue received from it by the recipient. If the invention fails to be exploited economically, the recipient of the support funding is under no obligation to refund the support money to the Center.

COMMUNICATIONS

The Innovation Centers should be active in the field of communications and other innovation promotion activities like invention contests and awards. It is essential to have available leaflets and booklets related to patenting and other phases of the invention development process. Internet -contacts are important. Information of innovation activities and successful projects are often interesting to different audiences, including students, as well as to press, TV and radio.

EXPERIENCES OF INNOVATIVE ACTIVITIES

The experiences of advisory and support services for inventors from many countries have been positive: these services include the exploitation of intellectual property rights and the provision of funding for the first stages of the invention process, i.e. the initial evaluation costs, patenting and product development, and further on, promoting the possibilities for commercialization. In many countries these services have been brought close to the customer. The role of the regional network and its function is to screen the ideas with the best potential from the large number of proposals submitted and to assist in developing these into significant innovations. Often the innovation activities have increased in all of the three main groups of innovators: in business enterprises, in universities and among private persons.

The positive activities and atmosphere towards innovations and entrepreneurship have had many important influences such as

- Children and students in universities are more interested in sciences and mathematics
- Universities and companies are active with their innovation and patenting strategies and policies
- The government has valid technology and innovation policy
- Innovative companies allocate more human efforts and financial resources to research and development activities
- Amount of patent applications, new products and innovative enterprises have grown
- Many innovative companies seem to be more profitable than others
- With success of innovative companies, different interest groups get profit or revenues, like taxes to government and municipalities, dividends to shareholders, business opportunities to subcontractors and service companies, more employment and good products to customers
- New technologies support a renewing society.

TECHNOLOGY PARKS

Technology parks or centers or Science parks are organizations, where innovative, modern and often technology-oriented companies are located. They are often near universities, from where also often many new business ideas come. Incubators are often part of technology centers. In addition to office and workshop space, technology centers may offer many other activities, which help especially new or small technology companies. These activities may include business and office services, educational activities for instance in business development, technology transfer, legal matters, internationalization etc. Technology parks create new areas of co-operation between companies, universities and other establishments of higher education, financiers, municipalities, and state organizations. In technology parks there are often also some units from universities, research centers or R&D units of large corporations.

Technology park is also often a suitable location for an innovation support organization (Innovation Center). Technology parks are often limited liability companies, where are public and private owners (government, city, university, banks, corporation etc.) Technology parks have national and international co-operation, for instance International Association of Science Parks (IASP).

INCUBATORS

The task of business incubators is to offer office facilities and to help start-ups spin off companies or new entrepreneurs and companies to meet their business objectives faster and better than before.

The business incubators for instance in Finland follow service model, which successfully combines the promotion of starting new companies, generating new jobs, the diversification of the economic structure, the exploitation of high technology, as well as the generation of new services for entrepreneurs and companies.

The common quality work started by the incubators can be expected to develop the operation of the newest incubators and also to improve the services and operations of the older incubator to best benefit the entrepreneurs and companies.

The network of business incubators, with the full range of services for starting and growing companies, is a good example of just the kind of industrial policy that is meant in the Finnish Government Entrepreneurship Program.

TECHNOLOGY TRANSFER OFFICES OF UNIVERSITIES

In many universities there is an organization for commercialization of research results from the university, it can be called Technology Transfer Office or a Licensing Office. Sometimes it is a part of the university; sometimes it is a limited liability company, where the university or several universities are owners. Often also some other organizations like Innovation Center or Technology Center can take care of these licensing activities.

The commercialization potential from the university depends on the ownership of the inventions. Generally, an individual owns his or her invention personally, whereas an enterprise or a corporation owns an invention made by its employee if it is related to the employer's business.

The ownership of the inventions made by university researchers varies by country. Often the university owns them. In these cases it is usually agreed, how costs and possible revenues are divided. According to a commonly used formula the profit of licensing are divided to equal amounts between the researcher (inventor) the university and technology transfer organization.

The profitability of the Technology Transfer Offices depends on the success of the invention projects. It is said that 10 percent of the projects carry 90 percent of revenues. Although in the world there are many success stories from university research, there are also remarkable amount of inventions without commercial success.

INVENTION ACTIVITY IN FINLAND AND THE FOUNDATION FOR FINNISH INVENTIONS

The Republic of Finland, a member of the European Union, lies in the north of Europe. Finland borders Sweden in the west and Russia in the east. Some 5.2 million people live in Finland. Finnish territory covers 338,000 square kilometers and includes 60,000 lakes. The whole country is covered in a blanket of snow in the winter, but summers are warm and beautiful.

Finland is a modern and progressive country with good social services and highly developed and specialized industries. The most significant industries deal with the processing of wood and metals, and, most recently, with information technology. Finnish high-tech exports grew over the ten-year span between 1989 and 1998 from 1 billion to 7 billion U.S. dollars. Finland's GNP per capita totaled EUR 23,500 USD in 2000, which was close to the mean for the European Union.

Some 130,000 students attend Finland's 20 universities. Men and women are equally represented. Finnish Government and corporations both invest heavily in research and development – currently a combined total of 3,4% of Finnish GNP, or near 5 billion U.S. dollars. When measured on the basis of patent applications per capita, Finland ranks among the first in the world with almost 500 annual applications per million residents. Only Japan, Germany and USA have a high ratio of patent applications to population.

Notable Finnish innovations include, among others, Nokia mobile phones and communications networks; Raisio Group's cholesterol-reducing margarine, Benecol; Polar-Electro's Polar-brand heart rate monitor; Vaisala radio sondes, SSH Internet encryption systems marketed by F-Secure Ltd, and many other innovations and new applications related to paper machinery, shipbuilding and environmental technologies. Finland is among the world leaders in cellular phones per capita.

International evaluations of Finnish innovation activities and competitiveness have shown that Finland ranks in these fields among the first ones in the world (<http://virtual.finland.fi>). The Finnish know-how, invention activity, networking and the various programs and funding for advisory services, evaluation, patenting, product development and commercialization of inventions are on a high level when compared internationally.

The Foundation for Finnish Inventions is an Innovation Center, which supports and helps private individuals and entrepreneurs to develop and exploit invention proposals both in Finland and internationally. The Foundation is at the forefront in advising, evaluating, financing, developing and marketing invention projects in different areas of technology. It serves as a link between private inventors, innovators, small and medium-sized enterprises, universities, research institutes, consumers, businesses and industry in Finland or in other parts of the world, whether it is a matter of setting up production, licensing or any other means of exploiting an invention. (www.innofin.com).

Funding is aimed at smaller companies and private individuals who need help with development and commercialization costs. The general repayment principle is that the Foundation receives a share of the income generated by the invention. If the venture fails, the Foundation stands to lose its financing. The Foundation for Finnish Inventions gets the bulk of its funds from the Finnish Ministry of Trade and Industry. The Foundation's annual budget is 5 million euros. Foundation staff numbers 25, in addition to whom there are 16 regional innovation managers and 12 innovation managers in major universities stationed in all parts of Finland.

The Foundation receives 16,000 advisory requests and 1000 funding applications each year. Three hundred applications are approved. In addition to funding the project managers give remarkable added value in the patenting and development phases of the inventions. The Foundation supports commercialization of inventions for instance through Invention market in Internet, license offers and legal assistance. One of five financed projects turns into a marketable product, which is either manufactured by the inventor entrepreneur or licensed to another manufacturer.

Many governmental and private organizations, like Tekes, provide research or product development financing or venture capital to Finnish small and medium-sized technology companies and larger corporations. Inventors' associations are important information exchange and advocacy groups for Finnish inventors.

Finnish invention activity is also promoted through national and regional, or industry specific, competitions, seminars, exhibitions and awards. The most important of these is the annual InnoFinland project, which culminates in the presentation of InnoFinland Awards by the President of Finland, currently Mrs. Tarja Halonen, to successful new innovative companies or inventors.

The network of Finnish Technology parks consist of about 20 Technology or science parks around Finland. The largest are in Espoo (suburban Helsinki) and in Oulu (north Finland). In most of them there are also incubator activities for start-up or spin-off companies (www.tekel.fi).

In Finland, in universities, there are innovation managers in co-operation of the university, Foundation for Finnish Inventions (Innovation Center) and Finland's Patent Office to encourage inventions and their commercialization from the university research.

Additionally, there are commercial companies partly owned by universities or governmental organizations to activate licensing nationally and internationally.

CONCLUSIONS

The potential and capacity of enterprises for innovation does not only depend on technical and financial resources. Innovation requires expert know-how in many areas such as management, intellectual property rights, the innovation process, production, marketing and co-operations skills. Networking is often advantageous. Understanding and managing various parts of the process is essential for securing the development of innovation activity. The public sector promotes innovation activity in many ways, but the responsibility and capacity for success lie with the enterprise itself.

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