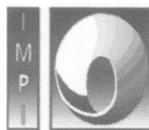


WIPO/INV/MTY/02/2

ORIGINAL:English

DATE:April2002



MEXICANINSTITUTEOF
INDUSTRIALPROPERTY



WORLDINTELLECTUAL
PROPERTYORGANIZATION



INSTITUTEOFTECHNOLOGYAND
SUPERIORSTUDIESOFMONTERREY

**INTERNATIONALWORKSH OPON
MANAGEMENTANDCOMME RCIALIZATIONOFINVENTI ONS
ANDTECHNOLOGY**

organizedby
theWorldIntellectualPropertyOrganization(WIPO)
incooperationwith
theMexicanInstituteofIndustrialProperty(IMPI)
and
theInstituteofTechnologyandSuperiorStudiesofMonterrey(ITESM)
Monterrey(Mexico),April17to19,2002

NEEDFORINNOVATION ANDINVENTIONDEVELO PMENTSUPPORTSERVIC ES
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DocumentpreparedbytheInternationalBureauofWIPO

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INTRODUCTION*

1. Innovation and inventions support services or structures or “innovation centers” are established and operated to stimulate, encourage, and assist inventors, entrepreneurs, and innovative companies, in the development and commercialization of new inventions and technology-based products or processes. Inventions, and the individuals who create them and bring them to market as new products or processes, are recognized as key factors in a country’s economic development. Successful inventions result in products and processes, and products and processes will create jobs and national income that enable improvement in the quality of life. The development and operation of innovation support services or innovation centers is an undertaking, that, if looked at from the national perspective, should contribute to the maximum use of creative resources among the entire population rather than supporting only those that could be found in the technically-sophisticated part of the population.

2. Technological creativity is a desirable performance characteristic of the professional engineer and scientist. Progress in terms of scientific advance, conversion of ideas into inventions, technology and products. Application of the technology in the form of new products or processes, is determined largely by the performance of such creative professionals working in industry, research centers, the universities or in government and industrial laboratories. We know however that not all engineers and scientists are technically creative and that the extent of individual creativity varies widely. We know also that technological creativity is not a privilege of professional engineers and scientists, but is exercised also by individuals in many other technical and non-technical occupations. The characteristic seems to be widely distributed among the general population, more like a “talent” than a learned skill.

3. “Invention” in the technical sense can be described as the application of technical knowledge to meet or resolve a perceived need or problem. If the need or problem is real and widespread and the solution (or “invention”) unique and cost-effective, development of the invention can result in commercial success. Once the potential is thus recognized, other factors such as the availability of business skills, become important in the long road from invention through product development to product launch and market success.

4. Innovation support services can facilitate considerably the successful application and commercialization of inventions and technology arising from research and development (R&D), or developed by individual inventors or their SMEs. Many of those who are not aware of the role and function of invention/innovation support structure (sometimes called innovation centers) might wonder why they are needed. They may quite properly inquire why their Governments should invest in an Innovation Center, especially when there are other demands from society for Government support.

5. In this presentation we will try to discuss some of the reasons for establishing innovation/inventions support services and why Government support is justified. Furthermore, we will present some basic features of such invention/innovation support services (or innovation centers).

* This document is based on two studies on the *Establishment of Innovation Centers in Developing Countries*, prepared for WIPO in 1998 by two consultants: Mr. George Lewett, former Director, Energy Related Inventions Program (ERIP), National Institute of Standards and Technology (NIST), Washington D.C., USA and Dr. John Turner, Managing Director, Flinders Technologies Ltd., Australia.

REASONFORHAVINGINNOVATIONSUPPORTSERVICES

6. Innovation/inventionsupportservicesarenecessarybecauseinventionandinnovationareimportantforthesuccessfuldevelopmentofeconomiesandsocietyinthemodernworld. Inventionandinnovationhavethepotentialtoenablequantumstepimprovementsinan economyandsociety. Todayeconomistsareunanimousthateconomicgrowthandsocial developmentarethetheresultofinventionandinnovation,i.e.theresultofsystematically appliedknowledge.
7. Inventionandinnovationoftenareattheoriginofnewindustriesandarethebasisfor revitalizingoldoneswithnovelvalue-addedproductsandmoreefficientprocessesand technologies.Growththroughinnovationcreatesnewemploymentopportunitiesandwealth atlocalandnationallevels.
8. Moreover,economicenvironmentsconducivetosuccessfulinnovation,withwell functioningintellectualpropertysystems,areattractiveforinvestorsseekinghigherreturnsin themid-term.Thiscanresultintheintroductionofnewtechnologiesandideas thatfurther enhancethedevelopmentofamodernindustrialsociety.
9. Inventionandinnovationdonothappen—theyaremadebyhumans.Unlikeother humanactivities,inventionandinnovationhavealonger(sometimestoolong)development andpreparatoryphasebeforetheyreachthematurity,when,onceonthemarket,theywill begingeneratingincomeandeventuallycompensatefortheinvestmentmadefortheir development.Itisexactlyforthatlongerdevelopmentstagethatinventionsandinnovations needspecialattentionandtreatment,inparticularavarietyofexpertknowledgeandfinancial support.

GOVERNMENTSUPPORTISJUSTIFIED

10. Asanaidtoboostingeconomicperformance,governmentsinmanycountrieshave encouragedinventionandinnovationintheirjurisdictionsthroughvariousinitiatives.Akey featureinmostcasesistheestablishmentofstructuresorservicesto provideassistanceto inventors,aswellassmalltomediumsizedenterprises(“SMEs”),R&Dinstitutionsandthe like.Organizationsprovidingsuchservicesmaygenerallybecalled“InnovationCenters”or also“InnovationandTechnologyIncubators,”althogethernamesareusedtodescribesuch centers,oftenreflectingtheirparticularstyleofoperation.
11. Itisinterestingtonotethatinmanyindustrializedanddevelopedcountriesgovernments providesignificantsupportforinnovationcentertypeactivity.Thisisbecausesuch innovationsupportstructuresprovidepublicservicetoarangeofinventors,SMEsand R&Dorganizationsfromwhicheconomyandsocietyingeneralwillbenefitafterseveral years.
12. Thechallengesfacingthecommercializationofanewinventionaresogreatthat professionalsupportisessentialforthemajorityofinventionstohaveanychanceof commercialsuccess.Innovationsupportstructuresorinnovationcentersshouldprovidesuch assistance.

13. An important factor for success in establishment and running of innovation support services is government commitment to invention and innovation as key elements for developing and sustaining a modern economy. An innovation center needs that support for a minimum of five years.
14. Private sector investors are only likely to support activities specific to their needs and to require a return on investment in a relatively short time period.
15. For example, in Europe exists a network of Innovation Relay Centers (backed by the EU's innovation program -CORDIS). Each is staffed with professionals in business and technology and is able to provide technological information, advice on technology commercialization strategies, intellectual property management and networking with other organizations locally, in the region, or nationally and internationally.
16. In the USA, there is a network of some 600 business incubator centers, represented by the National Business Incubation Association. Fifty-one percent of these centers are sponsored by government and non-profit organizations, 27% are university related and 16% are a hybrid of Government and private enterprise. About 8% are private 'for profit' organizations. Overall, these centers have created over 19,000 companies most of which are still in business.
17. There are networks of university innovation or technology management units or companies, affiliated with universities, for example in the USA (i.e. Association of University Technology Managers (AUTM)) and Australia (i.e. the Australian Tertiary Institutions Commercialization Companies Association (ATICCA)) that engage in innovation support type activities in their region. Each has its own style of operation and organization, however with the same or similar objectives: to turn ideas, inventions and innovations into profit earning products or enterprises. Newly established innovation centers or innovation support structures should benefit from affiliations with the established networks such as those mentioned above.

CONSIDERATIONS IN DESIGNING AN INNOVATION PROMOTION SERVICE

18. A national innovation support service would be expected to:
- receive inventions from individual citizens or resident companies;
 - determine their potential for commercial success; and
 - provide support for those with sufficient potential.
19. Services offering these three elements will be determined largely by the following:
- (a) the need to maximize the number of inventions routinely processed;
 - (b) the need to encourage, acquire, and promote investment of resources (time, expertise and money) in the development and commercialization of "promising" inventions;

- (c) the need for objectivity in identifying those expected -few “promising” inventions which can be recommended for support by investors;
- (d) the need to educate and assist inventors/entrepreneurs in order to increase chances of commercial success.
- (i) Need to maximize the number of inventions routinely processed

20. Since the proportion of submissions with potential for commercial success (“promising”) can be expected to be below (3 -5 %), the services should be open to all individuals, resident companies, universities, and government institutions, who would submit inventions and innovations for assessment and possible support; consideration could be given to participational also by foreigners where significant benefit to the country itself can be identified.

21. Furthermore, an outreach or promotional program to solicit submission of inventions through advertisements, mailings, and conferences or workshops, should be a principal program activity.

22. Informing and educating inventors in science and technology, and researchers and scientists in the profession of inventing, but also offering the whole group of inventors education in intellectual property matters should be intrinsic to the activities in order to increase the number of inventors in the population as well as to improve quality of submitted inventions.

- (ii) Need to encourage, acquire and promote investment of foreign sources in the development and commercialization of “promising” inventions

23. The national governments should sponsor and support the services to the extent possible, e.g. through provision of a financial incentive to selected program participants, provision of seed money for “promising” inventions, a policy of matching funds of other investors, and by promoting credibility of the services and the inventions identified as “promising.”

24. Partnerships should be promoted with other national programs designed to assist or promote research and development, innovation, entrepreneurship, and small business formation and development. Particular attention should be given to promoting the use of the intellectual property system in all its aspects (information, protection, enforcement).

25. Partnerships should be sought with potential institutional investors, notably international agencies supporting country development, with multinational companies, venture capital funds, investment and development banks, and with the pertinent development agencies of the major developed countries.

- (iii) Need for objectivity in identifying those expected -few “promising” inventions that can be recommended for support by investors

26. Anevaluation unit should be formed to evaluate inventions for technical and commercial feasibility, and determine their industrial and market potential. This would permit to identify those expected -few “promising” inventions, which can be recommended for

support by investors (government and/or private sector). To the extent possible, the unit should be organizationally, administratively and politically remote from units which are assigned responsibility for providing or coordinating support of "promising" inventions.

27. Technical staff in the evaluation unit should be well credentialed as well as technically competent so as to maximize their credibility to inventors and the credibility of their evaluation findings to potential investors in "promising" inventions.

28. Since the inventions to be evaluated can be expected to be very diverse in terms of subject area, level of technology, and stage of development, the evaluation process should incorporate substantial utilization of consultants and experts and all other sources of scientific and technical information.

(iv) Need to educate and assist inventors/entrepreneurs in order to increase chances of commercial success

29. Inventors, innovators and entrepreneurs should be educated and assisted in order to increase chances of commercial success and minimize loss of investment by early identification and development of "promising" inventions; special attention should be given to education in the functioning of the intellectual property system.

30. Education and assistance should be provided only in support of "promising" inventions, and considered as an investment of resources (e.g. time and money). Support should be the responsibility of a service unit formed for that purpose.

31. Every effort should be made to engage other national technical or business assistance programs in the support of "promising" inventions. Staff of the support unit should be well networked both nationally and internationally, and should be knowledgeable not only in business operation, licensing, and intellectual property, but also in new product development processes.

32. Special attention should be given in staff selection to knowledge of local (domestic) markets or community needs, as well as international market factors and considerations.

SOME GUIDING PRINCIPLES FOR THE CREATION OF FINNOVATION SUPPORT SERVICES OR STRUCTURES

33. A general and important role of all innovation support services/structures or innovation centers is to assess the commercial prospects of inventions, innovations and business proposals and to promote the most promising opportunities through providing various forms of assistance, support and services.

34. In other words, technically unsound or commercially unfeasible proposals are set aside and those with good prospects are supported and developed through the elaboration of plans of action and then business plans and, if appropriate, provision of legal, technical and other services, and, what is often most important, access to investments.

35. The programistoencouragesubmissionofmo reandbetterinventionsbyinventors, researchersandsmallcompanieswithinanindividualcountry,providemeanstofacilitate inventiondevelopmentandcommercialization,andfostergrowthofanationalinfrastructure forlong -termsupportofsuchtechn ology-basedeconomicdevelopment.

36. Thedevelopmentofnewadvancedorhightechnologyinuniversitiesandlarge corporateornationalR&Dlaboratoriesandorganizationsisrecognizedasanimportant elementintechnology -basedeconomicdevelopment.Al thoughmanyofthemhave developedorestablishedtheirownotechnologycommercializationunits,suchorganization shouldalsobenefitfromtheexpertiseoftheinnovationsupportservicesofferedbythe innovationcenterorstructure.

37. However,inma nycountriesitwouldseemalsouseful,andappropriate,topaymore attentiononpromotingadaptationofexistingtechnology;thatis,tofocusonproduct innovationbyindividualsandcompanieswhohavenotparticipatedintheresearchand developmentofthetechnologiesunderlyingtheproduct.Forexample,theprogramwould encourageinventionandcommercializationoftools,equipment,orconsumeritemswhich makeuseofanewcompositematerialtoimproveorenableperformanceofagivenfunction, ortodecreaseproductioncostsofaparticularem.

38. Particularattentionshouldbepaidtothepopulationofindividualinventors,including theformationofmemberorganizationsasameansofmakingbetteruseofthisnational resourceofcreativeindividuals.Also,effortsshouldbeencouragedtoeducateandinform inventorsandassisttheirinventiveandentrepreneurialendeavors.Aninnovationsupport programshouldgofurtherandactivelysupportthedevelopmentandcommercializationof inventionsemergingfromthepopulation.

39. Optimizationofthecommercialoutcomescanbefacilitatedthroughanexecutivefrom anInnovationCenter(aCenter'schampionforaparticularproject)workingcloselywithan inventororprojectteaminanR&DorganizationorSMEduringtheimplementationofthe businessplan.

40. Inprinciple,aninnovationsupportstructurecouldbeset -upandoperationalbetween tento18monthswithGovernmentssupportandgoodwillfromthecommunity.Itislikelythat individualcomponentsoftheplancouldbeintegratedasneededmorequicklywithexisting organizationsengagedinsomeinnovationcentertypeactivity.

41. Innovationcentersnormallydeveloptheirownmanagementstructuresandpolicies relevanttotheparticularcircumstancesinthecountryorregionwheretheyoperate.

INNOVATIONSUPPORTSTRUCTUREORCENTERFORINNOVATIONAND INCUBATION

42. ACenterforInnovationandIncubationshouldoperatewithinthenationalboundaries, withinthenationaljurisdiction .Morethanonemaybeeventuallyrequireddependingonthe extentofparticipationbyresidentinventors.Theprincipaldeterminantsshouldbethecountry population.Populationsizecanbeexpectedtoreflectthepotentialnumberofinventorsand otherslikelytosubmitinventionsandnewproductsforreviewandsupportbytheCenter.

43. The Centers should have four major functions, in addition to administration. These functions can be performed either within -house staff or contractually. They are:

- program promotion and outreach;
- application processing, including initial screening of submitted ideas or inventions to determine acceptability for evaluation;
- providing business assistance, including incubation, in development and commercialization of high potential inventions identified in the evaluation process;
- brokering, i.e. activities designed to acquire financial support for commercialization of selected inventions supported by the Center.

Program promotion and outreach

44. This should be the principal activity of the Center in the first six months of operation. Program literature and application forms will have to be developed, as well as policies and procedures for processing applications. Promotions should focus on the importance of invention in economic development and present the program as a public service for inventors and small technology -based firms but also on national R&D organizations and laboratories in the interest of creating jobs and new products to increase national income. It should aim at enlisting the aid of the general population of inventors in stimulating the economy. Where other programs exist, aimed at new and advanced technology development, the differences in program objectives and thrust should be emphasized. However, particularly where no such other programs exist, no source of new technology within the country should be excluded from participation in the program.

45. Program promotions should be defined to include efforts to better educate and inform inventors and R&D personnel. This could be done by supporting development and implementation of technical or professional schools and university curricula in technology acquisition and in the various aspects of technology and intellectual property management. Then national inventors' organization could be a key element in teaching inventors to make greater use of technology resources and to invent better, with program availability as a basic incentive.

Application processing

46. An inventor or company will apply to the Center for support by submitting an application form accompanied by material describing the invention and the potential value of its further development and commercialization. The Center will conduct only the first step in processing the application, that is to determine whether the submitted material is acceptable for evaluation by the technology evaluation unit. Once an application is accepted it should be forwarded to the Technology Evaluation Service (TES).

47. The Centers should establish a record system for long -term documentation and tracking of applications and inventions processed. The system should be consistent with and integrated with that utilized by the Technology Evaluation Service (TES).

48. Criteria for acceptance of an application for evaluation should include legibility, completeness, basic technical and scientific soundness, economic and financial feasibility and suitability for expenditure of national resources. Some limitations may also be placed regarding subject area and technical depth, at the discretion of Center and program management, primarily for economic and practical reasons. Generally the programs should be market-driven, that is, the subject area of inventions should be determined by market needs perceived by the inventor, the company or the research. The Center would also assess the alleged market potential. Time of submissions should also be selected by the submitter. In other words the acceptance, evaluation, and support process should be continuous, open to inventors at any time, without discrete periods in which proposals are requested, evaluations conducted, and awards made.

49. Application processing imposes correspondence requirements, particularly in response to inventor objections or rebuttals when notified that an application is not accepted. This can be expected to occur in some 20 % of the rejected cases (i.e. about 10 % of total applications, since about 50 % of the applications are likely to be turned down). While this added workload is significant, it should be looked on as part of the educational and informational activity of the Center. From experience in several countries we know that many such unacceptable submissions will be improved by the inventor, resubmitted, accepted, and eventually found to be recommendable as "promising."

Providing business assistance

50. The Center manager will be informed by the Technology Evaluation Service when evaluation of an acceptable invention has been completed. When an invention has been designated as having sufficient potential to warrant program support (that is, it is recommended as "promising"), it will be assigned to a particular staff member who will assess the support requirements and coordinate effort to meet those requirements. The report from the evaluation should address both technical and commercialization issues and should serve as a principal input to the assessment. However, personal contact and discussions with the inventor/researcher and/or company will be essential.

51. The number of "promising" inventions emerging from the evaluation process in the first year can be expected to be very few. The time available therefore can be well utilized by the Center to design and establish a support process. A key factor in this will be the availability of required services from existing government programs and establishing a list of consultants with expertise in various fields. The principal needs will include: instruction in the alternative approaches to commercializing a technical product (viz .licensing; business startup; partnership venture); patenting assistance; additional research and development (modeling, experimentation, testing, prototype development, engineering design); business planning; and market research and analysis.

52. "Incubation", that is, housing selected business start-ups in the Center's premises or in space with ready access to the Center, should be included as a primary method of providing business assistance. It will not be a requirement in all cases but in many it will be essential.

Brokering

53. Performance of the brokering function is also dependent on the flow of "promising" inventions emerging from the evaluation process. The flow can be expected to become fairly steady once the "project pipeline" of the Center is full. However, this could easily take a year

ormore. In the interim, major attention can be given to the question of how to meet the extensive capital requirements of technology commercialization. Government or institutional fundings should be provided primarily as an incentive to entice inventors and small companies into the support system. The principal capital amounts must come from private sector sources that are attracted by profit-making potential.

54. Since extensive private sector interest is not likely without a program track record, considerable emphasis needs to be placed on the credibility of the evaluation unit and its "certification" and delineation of potential value in each case of a recommended invention. This, with government backing, might serve to attract the experimental participation of institutional investors. Development of an endowed investment fund should be explored.

The core operations of the Center

55. The first to start with would be the establishing of the services that represent the core activities of an innovation/invention promotion structure or service, i.e. the Technology Evaluation Service (TES) and the Invention and Innovation Development and Incubation Service (IDIS).

56. During the initial phase of the creation of an innovations support structure, a Technology Evaluation Service (TES) should be established. As its name already reveals the TES will have the task to assess and evaluate the inventions and innovations submitted in respect of their technical feasibility, relevance, commercial potential and appropriateness. The TES will rely on experts and consultants in the field of technology and marketing. The assessment will not duplicate or question examination of patent applications done by IP Offices, but will take them into consideration.

57. The Invention and Innovation Development and Incubation Service (IIDIS), in cooperation with the TES, should develop criteria, forms and procedures for processing requests for evaluation to be submitted by the various national users of the innovations support services scheme. One principal concern should be the communication links and methods between evaluators and the inventors, innovators and entrepreneurs in the country, particularly with respect to translation and interpretation difficulties. Another concern would be to define the subject area or scope of inventions to be accepted for evaluation; e.g. it may be practical to concentrate on certain priority areas (i.e. transportation, agricultural technology) or to exclude i.e. computers software, weapons systems, pharmaceuticals, and other areas requiring excessive effort or special considerations to evaluate.

58. At the same time the IIDIS should develop an initial outreach plan to announce the services throughout the country, target potential participants, and develop and distribute program literature and application forms. This will require also preliminary design of the basic support process to be utilized for items recommended after evaluation by the TES; this should include specification of provisions for potential financial aid.

59. Special attention should be given to confidentiality and proprietary issues involved in dealing with the intellectual property included in the submissions. Providing assurance to inventors that their intellectual property will be held confidential, and conflict of interest situations will be avoided, is essential to success of the services.

60. The creation of a national -level support committee or council to oversee and support program operation in the country would be an excellent cooperation tool. This should be coordinated with IIDIS operation to ensure that all local industry, government and academic resources are effectively networked.

61. Initial receipt and processing of applications could take place about 6 months after program initiation. A records system should be in place by then to provide for monitoring input and output, and tracking performance statistics for the innovation support structure. Success and budgetary efficiency will be dependent on achieving sufficient input to ensure an output flow of "promising" cases. In any case attention must be given to the statistics so as to measure performance and to guide action to improve the numbers and quality of the input. The IIDIS should prepare a report at the end of the first year to provide an initial view of performance and to project needs for modification or improvement.

62. The Invention and Innovation Development and Incubation Service (IIDIS) could be established with an initial staff of five or six people:

- a manager with appropriate experience and capabilities;
- a technical analyst with technical background capable of understanding, analyzing, and classifying technical material for various purposes;
- at least two people capable of developing and conducting outreach, promotional, and networking activities; and
- supporting clerical or administrative staff.

SUMMARY OF A PLAN FOR THE ESTABLISHMENT OF INNOVATION CENTERS

63. There are many ways and models that can be followed for establishing an innovation support structure or an innovation center. The structures could be national, regional or local. They could be totally government supported, entirely private or mixed. The structures could be created, for example, seeking assistance from individual experts or from other innovation centers, or from countries with the necessary experience.

64. The creation of an innovation center or an invention/innovation support structure would usually involve three stages as follows:

Feasibility study

65. Establishment of an innovation structure or an innovation center should start, as a first step, with a feasibility study on the usefulness and the successful operations of an innovation center. The feasibility study should identify:

- the existing innovation and invention potential;
- the sources of invention and innovation;
- the major fields of technology where innovations/inventions are created;

- the existing expertise;
- the legal and financial framework;
- government policies and support for innovation and intellectual property system;
- the SMEs, R&D organizations, etc. needing assistance;
- the economic and financial environment for SMEs and public sector R&D.

66. Furthermore, consultations should be organized with Government departments (patent office/industry/science and technology), R&D organizations, universities, industry associations (chambers of commerce), patent attorneys/IP lawyers' associations and inventors' associations.

Establishment of an innovation center

67. If the prevailing conditions are favorable and the Government approves, the establishment of an innovation support structure can start.

68. This has two phases:

- (a) elaboration of strategic directions; and
- (b) operational planning and implementation.

69. The elaboration of a strategic direction for the innovation support structure would comprise the following activities:

- identify a possible general manager or coordinator;
- define objectives of center (with general manager or coordinator);
- define the center's corporate structure;
- define participants (stakeholders) in innovation structure (network) or innovation center;
- government agencies (departments of industry and technology);
- universities and other public R&D organizations;
- banks and other financial institutions;
- private persons and organizations;
- define the board membership;
- define the activities of the innovation support structure;
- innovation awareness advertising;

- training and awareness seminars for inventors/researchers/SMEs/investors;
- invitation to inventors/researchers/SMEs to submit proposals;
- evaluation (by TES) of project potential of submitted inventions/innovations (technical & commercial);
- selection of projects with success potential (and rejection of non-viable projects);
- development (by IIDIS) of commercialization strategies (business plans);
- management advice (by IIDIS) for project development and commercialization;
- internet site with information on center and links to other relevant sites.

70. Operational planning and implementation of the plan for establishment of the innovations support structure (network, center) would include the following activities:

- recruitment of CEO (General Manager, Coordinator) by the Board;
- recruitment of Personal Assistant for CEO (initially on a temporary basis);
- identification of site/premises for offices of the Innovations support structure;
- formulate policies and procedures for operations and discuss with Board;
- policy relating to initial free consultation (e.g. 1 hr. duration);
- policy on further support (e.g. project equity, not fee by Center);
- produce a checklist to assist Inventors/Researchers/SMEs submit proposals;
- produce a scoresheet to facilitate project evaluation;
- select local adviser to innovations support structure (network, center) and discuss with Board;
- select project assessment panel and seek views on checklist and scoresheet;
- select accountants and auditors for Innovation Center;
- select legal advisers for Innovation Center;
- identify technical experts to assist in project evaluation;
- develop and apply pro-forma and model agreements;
- pro-forma confidential disclosure agreement;
- pro-forma supply of materials agreement;

- pro-forma assignment of rights;
- model R&D, license, and joint venture agreements;
- create and publish internet site with information on innovations support services and link to other relevant sites;
- engagement of business development executives.

71. This will complete the preparatory phase and permit the commencement of operations under the innovation support scheme (network, center). Immediately preceding the opening of the Innovation Center the campaign for creating public awareness should begin and invitations for submission of inventions/innovations to the various groups should be issued.

72. The implementation of such a plan will require professional guidance by experts, which should continue also during the first months of the regular operations of the scheme. Such assistance will be needed in respect of the following:

- evaluation of project potential (Technical and Commercial);
- creation of commercialization strategies and documentation as business plans;
- management of Project Commercialization.

73. In the future operation of the innovation promotion scheme the possibility of active search for interesting proposals (called sometimes "technology scouting") should also be envisaged.

PROGRAM IMPLEMENTATION

74. For developing countries it will be always an advantage, if the Government or the public sector participate actively in the establishment of innovation support structures. At the outset a program should be established, identifying the objectives, the major participants, the role of the government or supporting institutions, and prescribe an initial budget, particularly with respect to financial assistance to be provided to selected inventors or entrepreneurial companies.

75. The program should incorporate the specifics of establishment and operation of the various services, to be offered under the innovation support scheme, as described below in the tasks and items to receive particular consideration. The tasks and items are listed roughly in order of time sequencing.

COMMENTS ON CONDITIONS, RESOURCES AND REQUIREMENTS FOR IMPLEMENTATION

76. The principal motivation to initiate an innovation support should be the attitude and interest of the country's government to encourage and use the innovative and entrepreneurial potential of its citizens. Almost by definition the individual and small business populations in

all countries can be expected to possess less technical sophistication than scientists and researchers working in universities, R&D organizations and larger industrial enterprises. The experience of successful innovations supports schemes, implemented in different countries, in terms of the numbers of applications and the success ratios must be interpreted with knowledge of the technological and general development level of each individual country. National interest in applying innovations support programs should come from a desire to increase capability rather than by the expectation of rapid benefit from existing capability. Such a desire could well be evidenced by other government initiatives to stimulate and encourage academia and business in innovation and technology development.

77. The persons engaged to operate the innovations support scheme or network should have a high level of motivation, business ethics and professional experience. They should be able to assess risks and to take well justified and documented decisions. Also very important is the presence of a high degree of responsibility.

78. Furthermore, staff should be required to be competent in accessing technical and business information by computer. Each staff member should be equipped with state-of-art equipment and be fully trained in use of the Internet as well as searches in commercial databases. E-mail communications should be used to the maximum extent possible, including communications with the evaluation consultants. Attention needs to be given to computer security particularly when requesting or transmitting consultant input on proprietary material.

79. It is necessary that from the outset a newly established innovations support structure develops and maintains close cooperation contacts with similar institutions or structures in other countries.

80. Costs of operation are somewhat predictable for the innovations support scheme once a level is established for input in terms of applications submitted. Both the evaluation and support processes are labor-intensive, and the staff levels suggested earlier are sufficient for cost estimation in the pilot stage.

81. The number of inventions received for evaluation by a national innovations support scheme in many developing countries is likely to be very small. Even with the minimal evaluation staff (3-4 engineers) the cost of evaluation on a unit basis could seem to be excessively high. It should be noted however that minimal staff size will be determined more by subject area variety than by the number of evaluations required, up to a certain point. Evaluation consultant costs will be directly proportional to the number of evaluations, and to the quality of the invention evaluated, as measured by the proportion qualifying for second stage evaluation.

82. That evaluation can seem excessively expensive when viewed on a per-unit (evaluation) basis is not surprising considering the extent of screening required, i.e. when 90-95% are eliminated as not "promising." Nevertheless, the expenditure, particularly in the short run, may only seem worthwhile when viewed as a means of educating, and providing a consultant service to, a select part of a country's population. Furthermore, this selection process will permit to concentrate scarce resources, available for developing new inventions and innovation on the few, "promising" ones, and thus the expected success rate would be considerably higher.

CONCLUSION

83. Innovation/invention support services and structures are necessary not only because invention and innovation are important for the successful development of economies and society in the modern world, but mainly because invention development and innovation is a complex process and it requires substantive expertise and resources. Invention and innovation have the potential to enable quantum step improvements to an economy and society. Today economists are unanimous that economic growth and social development are the result of invention and innovation, i.e. the result of systematically applied knowledge.

84. Invention and innovation often are at the origin of new industries and are the basis for revitalizing old ones with novel value-added products and more efficient processes and technologies. Growth through invention and innovation creates new employment opportunities and wealth at local and national levels.

85. As an aid to boosting economic performance, Governments should encourage invention and innovation in their jurisdiction through various initiatives. A key feature in most cases is the establishment of innovation support services to provide assistance to inventors, as well as small to medium sized enterprises ("SMEs"), R&D institutions and the like in the transfer of their inventions and research results to the industrial users and to the market. It is the task and obligation of governments and the public sector to provide the best start-up conditions for innovation to develop and flourish – expenditure in this respect should be considered as a strategic investment.

86. Investment in the creation of efficient invention/innovation support structures should be considered by Governments as a public service, necessary to promote knowledge and innovation-based enterprises and generation of employment opportunities. Such investment should be part of the Government expenditure for scientific and technological R&D.

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