

WIPO/IP/DAR/00/13

ORIGINAL: English

DATE: June 2000



GOVERNMENT OF TANZANIA



WORLD INTELLECTUAL
PROPERTY ORGANIZATION

**REGIONAL SEMINAR ON THE BENEFITS OF THE
INTELLECTUAL PROPERTY SYSTEM FOR UNIVERSITIES,
UNIVERSITY RESEARCHERS AND RESEARCH
AND DEVELOPMENT ORGANIZATIONS**

organized by
the World Intellectual Property Organization (WIPO)
in cooperation with
the Ministry of Science, Technology and Higher Education
of the United Republic of Tanzania

Dar es Salaam, June 20 to 22, 2000

NEEDS FOR ESTABLISHING INNOVATION AND INVENTION SUPPORT
STRUCTURES OR SERVICES IN UNIVERSITIES OF DEVELOPING COUNTRIES

ROLE AND FUNCTION OF AN INNOVATION CENTER IN
A DEVELOPING ECONOMY

*Document prepared by Dr. Tom Peter Ogada, Senior Lecturer and Researcher, Department
of Production-Engineering, Faculty of Technology, MOI University, Eldoret*

I. INTRODUCTION

1. Following the launching of *the Economic Reforms of 1996 - 1998: Policy Framework Paper*, the Kenyan Government's position on financing of Education is that the public expenditure is to concentrate on primary and secondary education. This implies that the funds available for university education has been reduced and Kenyan universities have been urged to put in place strategies which can enable them generate income using internal resources to finance the shortfalls. The issue of financing university education is increasingly becoming important in Africa and already much attention is being given to it. For example, the African Network for Scientific and Technological Institutions, in collaboration with the University of Botswana, is organising a workshop on the financing and management of Engineering Education in Africa, which will take place in the university on 9-11th, August, 2000. One of the sessions of the workshop will be dedicated to strategies which can stimulate income generation activities in the universities in African.

2. This paper discusses the problems facing the development and operation of income generation units in African universities, with particular emphasis on commercialisation of innovations and inventions activities and the need to establish structures or services which can effectively address the problems.

II. TYPES OF INCOME GENERATION ACTIVITIES IN UNIVERSITIES

3. Income generating activities, which are currently being undertaken by universities in Africa, can be generally classified in two groups, namely; teaching (parallel degree) programs and non-teaching income generating activities. These are briefly discussed here below:

A. Parallel Degree Programs

4. Currently most universities in Kenya are running parallel degree programs, whereby, apart from the regular students sponsored by the government, universities are also admitting students who are self-sponsored. These students take their lectures separately in the evening and weekends or together with the regular students. Most Kenyan universities borrowed this concept from Makerere University, Uganda, where parallel degree programs have been in operation for some time and significant experiences have been acquired. The launching, operation and the management of parallel degree programs have been smooth in most universities apart from few hitches here and there. The hitches have been mainly due to the initial absence of management policy to govern, amongst other things, the distribution of income, the payment of service providers as well as the purchase of teaching materials. This success in the running of the parallel degree programs is attributed to the fact that teaching is the core business of universities.

5. Although parallel degree programs initially encountered hostile reception from the Kenyan public, currently they are slowly becoming acceptable due to sufficient sensitisation campaigns the universities concerned have made. The public has been made to understand that Kenya has been spending some 15 billion Kshs, yearly sponsoring Kenyan students

studying in developed countries. This figure has been estimated based on the fact that some 15,000 Kenyan students are currently studying abroad, each requiring some US\$15,000 a year for tuition and maintenance. Although the average required in reality may be less than US\$15,000, it is becoming common knowledge that, most programs in some universities of developed countries, are sustained by the fee-paying students from developing countries. It is argued that if these students were all to join the local universities and pay fees, part of the money generated could be used to develop infrastructure in the local universities. Makerere University is a good example of this, since the university is said to have put up several impressive buildings using income generated from parallel degree programs.

B. Non-Teaching Income Generating Activities

6. Apart from the parallel degree programs, some universities are also encouraging the development of non-teaching income generating units (IGUs). In Moi University, the non-teaching income generating activities are classified in four main groups. These are Production Units, Service Units, Business Units as well as Consultancy, Research and Development.

a. Production Units

7. Production units are income generating activities, set up to use idle time of the facilities and manpower within the teaching departments and faculties, to generate funds. Typical examples are the welding and fabrication works in the Department of Production Engineering and furniture production in Wood Science and Technology of Moi University.

b. Service Units

8. Service Units include Library, Catering and Health Departments, which apart from providing essential services to the university community, may also use their facilities and manpower to provide extra services within and outside the university and generate funds. For example, in some universities, the catering departments are already successfully managing University Guesthouses and Hotels whereas some libraries are internet providers.

c. Business Units

9. Business units are those developed or converted to run independently, with FULL COST RECOVERY and profit generation (e.g. the planned Pharmacy in the Faculty of Health Science, Bookshop and Guesthouse in Moi University).

d. Consultancy, Research and Development

10. This is concerned with services such as consultancy, technology transfer, commercialisation of research findings and inventions, provision of patent information services and business incubation. These services can be provided by individual staff, departments, research groups or a university-wide team. Currently this is the least developed area of income generation in African universities and the most difficult to implement using existing structures.

III. BOTTLENECKS FOR INCOME GENERATION FROM CONSULTANCY, RESEARCH AND DEVELOPMENT

11. Despite the brain drain of experts from Africa, universities and R&D institutions are still endowed with the best trained and qualified personnel. The skills of this manpower could be utilised to generate income for the universities and thus enhance the realisation of the training and research missions of universities, contribute effectively to the industrial development of their countries and above all, reduce the loss of experts to more developed nations. Experience from universities in developed countries have shown that significant income can be generated through consultancy, research and development. Potential sources of income for universities include:

- Royalty and fees from licensed patents from staff innovations and inventions;
- Consultancy;
- Research contracts;
- Universities owned companies and joint ventures;
- Provision of patent information services for both researchers and industries;
- Provision of business incubation services for own innovations and inventions.

12. Whereas the potentials for income generation through innovation and inventions are there for most universities in African countries, these have not been adequately utilised and full realisation of these potentials may not be possible due to several bottlenecks. Recently, a Moi University IGU Committee identified the following problems (which may also be relevant to other universities) which hinder efficient and profitable operations the IGUs.

- Rigid and unconducise financial regulations
- Lack of clear operation guidelines
- Lack of business plans
- Lack of skills to formulate technical and financial proposals
- Slow recruitment process
- Lack of awareness on intellectual property rights ad use of patent information services
- Lack of Intellectual Property Policy
- Lack of a data bank on university specialists
- Lack of data bank on university research findings
- Insufficient marketing strategies of products and services of the units
- Weak university industry links

A. Financial Regulations

13. Financial regulations governing the operation of most public institutions are cumbersome, each financial transactions requiring several stages. Particularly the processing of payment and purchase are so tedious that they can not stimulated the business activities of the units and some units have lost customers for not delivering services in time

B. Lack Of Operation Guidelines

14. Although business units have been established in various departments, IGUs have been operating without clear and comprehensive guidelines being in place, to govern the day to day operations of the units.

C. Lack of Entrepreneurial Skills

15. Most academic staff lack entrepreneurial skills. Whereas they may be having innovative ideas, converting the ideas into business units, which can generate income for sustainability is a major problem. This is particularly critical to the heads of departments, who are looked upon to provide guidance in this. Whereas heads of departments have been trained to know that their core business is actually to ensure quality teaching and stimulate research in their departments and research groups, the commercialisation of the research findings is of scope for most of them. The heads of departments have not effectively take the advantages that occur during their interactions with industries. Consequently they are not able to effectively utilise the resources at their disposal to the maximum advantage.

D. Civil Service Work Culture

16. University staff, just like most other civil servants have civil service work culture of low productivity, insensitivity to deadlines and quality of service, etc. This culture is not conducive for efficient and profitable to business operations. During a workshop with managers from industries, pointed out that the civil service culture and bureaucracy are the two major impediments to doing business with universities.

E. Lack of Business Plan

17. The path of conversion of a innovation and invention into a business enterprise requires a detailed and well thought of business plan. Most units work without business plans. Units just conduct their business on an ad hoc basis, with no projections, targets as well as strategic plans. As such they do not have indicators against which they can evaluate their performance and profitability. And this is not because the unit managers do not want to have in place business plans. It is simple because they do not know how to do it.

F. Lack of Skills to Formulate Technical and Financial Proposals

18. Now and then there are advertisement from government institutions and non-governmental organisations as well as donor institutions requesting tenders for technical and consultancy services. Due to the wide pool of specialists in the university, most of these consultancy services could be easily handle by the university staff. But due to lack of skills and experience, it is difficult for them to put a winning technical proposals.

G. Slow Recruitment Process

19. Now and then, a staff may have research contract for which one requires the services of a temporary staff. Recruiting such staff through the normal university recruitment system within the shortest period is not possible. Most universities simply do not have a mechanism for rapid recruitment let alone temporary staff.

H. Lack of Awareness on Intellectual Property Rights and Use of Patent Information Services

20. It is a known fact that the number of patent applications originating from developing countries is very small. For example, out of the around four million patents which were in force in 1997, 34.5 % came from European Patent Corporation States, 27.8 % came from USA, 21.8 came from Japan whereas only 16 % came from the remaining countries including developing countries. But university staff are involved in research, innovative and inventive activities. In most cases, instead of trying to find out the patentability of their research findings, university staff are satisfied if they published in refereed journals. In this case, universities in developing countries have been losing millions of dollars. Furthermore, very few researchers use patent information as an aid for their research and innovation activities. This is due to lack of awareness on the importance of patent information systems.

I. Lack of Intellectual Property Policy

21. A major handicap for effective transfer of technology and dissemination of research findings from universities for industrial development and income generation is the lack of Intellectual Property Policy (IPP) in most universities. As already been shown in the paper "*need for Intellectual Property Policy in universities*", IPP is a requirement for smooth undertaking of commercial activities related to innovations and inventions. The presence of IPP can not only stimulate innovations and inventions within the universities but also remove the suspicion which exist between the university administration, researchers and to some extents, industries. A major factor here is the policy governing the distribution of income from royalty and license. In the absence of a policy, there is always fear from the staff that they would get a raw deal from the university. This is forcing some university staff to solicit for consultancy work on individual basis, what is normally not very successful since most organisations prefer working with institutions and not individuals. Some clever industries also take advantage of this and get innovations without paying for them (e.g. by employing students or the research assistants who have co-found the innovation with university staff)

J. Lack of a Data Bank on Research Findings in Most Universities

22. Most universities do not maintain an up to date data banks on research findings of their staff. Such information is at most left with individual researcher, who after managing to have it published in a refereed journal, updates his CV and that is the end of it. Thus, it is difficult to identify research findings with commercial potentials, which could be marketed for sale to industries for the productions of goods and services. This is not just a problem of developing countries. Recently we learn that in a German university, a researcher decided to comb all old masters and PhD theses. After some six months, he had identified several projects with commercial potentials.

K. Lack of Marketing Strategies

23. Currently most universities have not put in place Units to market their services to the external clients. As such, potential clients including industries as well as small and medium scale enterprises, do not know of the services the R&D departments of the universities can offer.

L. Lack of Strong University-Industry Links

24. Currently most universities in developing countries do not have a strong links with industries. In a recent workshop held in Moi University, which brought together people from the industries, chambers of commerce, research institutions etc, the managers from the industries singled out the bureaucratic operation of the universities as a major hindrance for a sustainable university-industry links.

IV. ROLE AND FUNCTIONS OF AN INNOVATION AND INVENTION SUPPORT UNIT

25. In order to address the bottlenecks mentioned in section 3, there is need for universities to have units, which is autonomous, independent and operated in a private enterprise manner, to provide support services to innovation and inventive activities of the universities. Examples of such structures are described here below.

A. Fraunhofer Gesselschaft

26. The Fraunhofer Gesellschaft was founded in 1949. It is the leading organisation of institutes for applied research in Germany. Conducting contract research projects for industry and government, it provides its customers with economic and immediately applicable solutions for their specific problems. Currently the Fraunhofer Gesellschaft has 47 research institutes located over Germany, having a total of 9000 equivalent employees, mainly scientists and engineers. In 1999, the institutes together undertook annual research contracts amounting to more than 1.3 billion German marks.

27. All the patent and licensing activities of the institutes of the Fraunhofer Gesellschaft are carried out by the Fraunhofer Patent Centre. The Centre offers the following services to the Organisation:

- Representation of Fraunhofer Gesellschaft in patent offices and federal patent tribunal
- Promotion amongst the employees of the organisation of awareness on Intellectual Property Rights (IPRs) and its benefits
- Securing and safeguarding of IPRs in Germany and abroad
- Taking measures to prevent contravention and litigation of IPRs
- Undertake background search as a planning tool for development projects
- Assistance in the formulation of R and D contracts

- Assistance in the processing of patenting
- Marketing and commercialisation of the invention including licensing negotiations.

28. Fraunhofer Patent Centre normally pays all the costs for processing patent applications, marketing of the invention, commercialisation and negotiation for licence. All patents generated by employees of the institutes under Fraunhofer Gesellschaft are owned by the Organisation. The net income is shared between the inventor and the organisation at a ratio of 75:25.

29. An important indicator of the orientation towards innovation of the R and D of the organisation and the effect of the promotion of innovation and invention by the Fraunhofer Patent Centre is the number of patents generated. In 1997, the institutes together filed 398 patents and the organisation currently accounts for about 50 % of all the patent applications from publicly funded German research organisations.

30. The Fraunhofer Patent Centre also offers Patent Information Services such as:

- Provision of complete and detailed technical description of a desired technology
- Novelty search before a research project starts
- Information about protected problem solutions
- Avoidance of investment for already solved problems

The activities of the centre bring several benefits to the Fraunhofer Gesellschaft. These include:

- enhancing and stimulating research activities in applied science and technology and patenting,
- generation of income from licensing,
- exploitation of research finding,
- the creation of employment opportunities and
- the promotion of industrial development

B. Moi University Holdings Limited

31. To stimulate the development of IGU and enable profitable and businesslike operations of income generating activities, Moi University has approved the establishment of Moi University Holdings Limited.

a. Structure

32. Moi University Holdings Limited will be 100 % owned by Moi University, but it will be fully autonomous in its operations and management. Its proposed organisation structure is shown below:

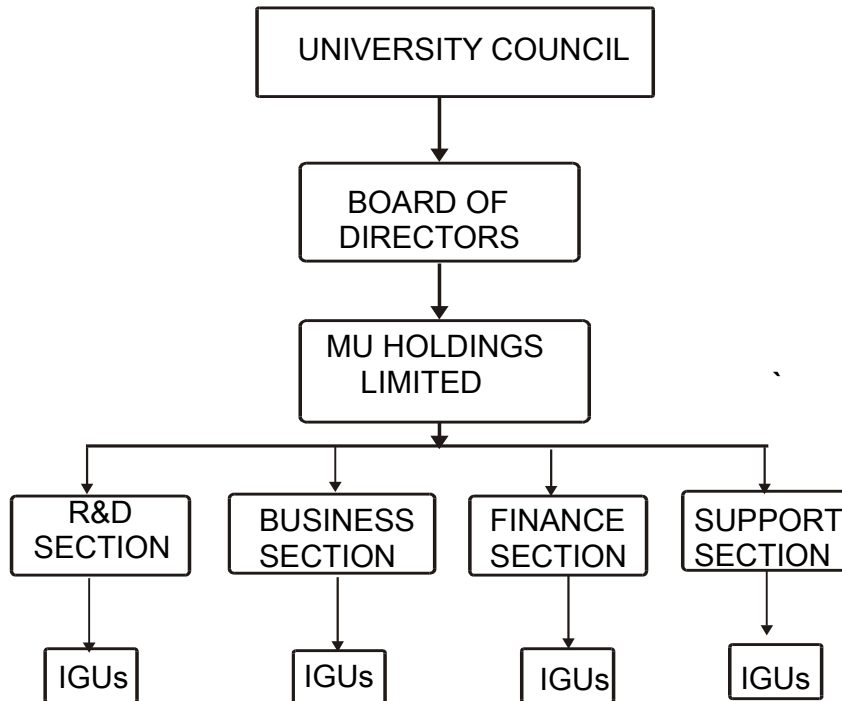


Figure 1. Proposed organisation structure of Moi University Holdings Limited

b. Specific objectives of the Company

- Co-ordinate, promote and market the activities of all Income Generating Units in the university, thus acting as a business incubator
- Develop new units and initiate new business opportunities
- Provide sound and business oriented management of all internal and external financial matters of
- Initiate, develop and market consultancy services for the university staff to industries, institutions as well as small and medium scale enterprises
- Promote technology transfer and dissemination of research findings
- Promote awareness on patenting and use of patent information services
- Develop management and entrepreneurial skill in university staff as well as promote private enterprise culture
- Formulate strategies to strengthen university -industry links
- Assist the university to commercialise non-core departments
- Assist researcher to commercialise their innovations and research findings
- Initiate joint consultancy, research and development with industries

33. To achieved the above objectives, and effectively carry out its activities, Moi University Holdings Limited will be organised into four distinct section:

- (i) Consultancy, Research and development
- (ii) Business development and management
- (iii) Financial management
- (iv) Support department

34. The section of Consultancy, research and development will be concerned with all issues relates to technology transfer, commercialisation of innovation and research findings, developing appropriate Intellectual Property Policy and encouraging the use of patent information systems. The business development section will provide all services related to developing new business centres and strengthening the existing ones through business incubation services. The financial management section will provide financial services not only for the business units but also research contracts, donor projects etc.

c. Immediately tasks of MUHL

35. In order to enable the company start with a strong foundation, Moi University Holdings Limited plans a series of activities during its first year of operation. These include:

- Developing a private enterprise oriented financial regulations for the IGUs and sensitise the Units managers on them
- Develop a clear and comprehensive operation guidelines for the IGUs and sensitise the unit managers on them
- Develop Intellectual Property Policy for Moi University and sensitise university staff of the importance of intellectual property rights
- Develop a data bank on research findings in the university

V. CONCLUSIONS

36. For universities in African to strengthen income generation through innovation and inventions, it is recommended that the management organs of the universities take radical steps and establish special units to provide support services. The units should be autonomous and independent and should operate in a private enterprise manner. They should be man by efficient and motivated individual, who are also business oriented. Only this way can universities be able to effectively utilise the specialised manpower and generate wealth and effectively contribute towards the development of their respective countries.

[End of document]