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STRATEGIC CONSIDERATIONS RELATED TO COMMERCIAL EXPLOITATION OF INTELLECTUAL PROPERTY AND KNOW-HOW: INTELLECTUAL PROPERTY RIGHTS IN THE EDUCATIONAL PROCESS; INTELLECTUAL PROPERTY RIGHTS IN THE BUSINESS DEVELOPMENT OF UNIVERSITIES; INTELLECTUAL PROPERTY RIGHTS IN THE PROTECTION OF SELLING IDEAS IN UNIVERSITIES

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INTRODUCTION

1. Governments everywhere are expecting universities to fulfil their role as major agents of economic growth. This is because, universities contain a large proportion of their personnel educated for intellectual creation.

2. Universities are therefore expected to develop this potential fully, "not only for teaching purposes, but also in order to contribute through research in science and technology and in the social and human sciences, to the advance of knowledge, to the creation of new knowledge, to cultural development and fulfillment, to the solving of the problems with which society is faced, to sustainable development and to ……" (UNESCO, 1998). It is the fulfillment of the above roles that determine the relevance of universities to society. Successes in a number of countries, for example the newly emerging economies in South East Asia, provide evidence to the role of universities as "powerhouses of the "knowledge economy".

3. The need for relevance and accountability to society in general has acquired new dimensions and is compelling universities to rethink their mission and redefine their objectives and functions. This need is particularly evident in today's world. The many challenges posed by the processes of democratization, globalization, regionalization, marginalization and fragmentation call for adequate responses on the part of the university and R&D institutions. More specifically, the challenges posed by the current multilateral trading arrangements point to the important role of universities in expanding innovation and intellectual creations in Less Developed Countries (LDCs) if such countries are to compete equitably in the global market. Equally important are the shifting imperatives of economic and technological development and the modifications in development strategies. Indeed, the fast and enduring technological advancement in industrialized countries point to this need to step up intellectual creations in LDCs either through own creations or technology transfers in order to bridge the widening gap between the rich and poor countries.

4. It is therefore quite clear that the search for solutions to the problems of economic, social, cultural and sustainable environmental development facing African countries should call for greater participation by African Universities. It compels universities and R&D institutions to create and build ties and linkages with the State, industry and the business community to enhance technology transfer and hence contribute to economic, social and cultural development of these poor economies.

5. Research as one of the major functions of universities is a precondition for their social relevance and academic quality, for it is through research that intellectual creations are forged. Intellectual properties (IPs) are a product of such creations by universities and other institutions of higher learning, Research and Development institutions, industries and individuals and are important income generating assets for their holders or owners. Apart from income generation, Intellectual properties rights have many other benefits which include technology transfer and enhancement of technological Innovations. However IPRs by themselves will present no benefits if they are not exploited or commercialized. As it has been observed by many writers, the road to commercialization of 1PRs is long and frustrating. This paper therefore attempts to examine the strategic considerations related to commercial

exploitation of Ps and know-how. It accomplishes this objective first, by examining the nature of IPRs in the Education Process. Secondly, the role and advantages of IPRs in respect of the business development of universities is outlined. Thirdly, we discuss the various ways of exploiting and commercializing IPRs. Finally, we examine the issue of protection of IPRs in universities.

THE NATURE OF IPRs

6. Before looking at the various ways universities can use IPRs in the business development of their institutions we need to get a clear understanding of the nature of intellectual property rights. A major problem facing African countries is the lack of awareness on the what IPRs entail and the benefits that can accrue therefrom. Their lack of awareness on the nature and benefits of IPRs has subsequently engendered their ignorance on the need to protect such valuable assets. As a result, African countries have lost a lot of income especially in the export business. For example, Kenya was one time a good exporter of the famous 'kiondo' (women's baskets), especially, to American markets. After only a couple of years the country lost this lucrative market and hence its business. What was the major reason for this loss of business? Kenya had forgotten that the design had to be protected in the American market and other major markets. As a result Competitors from East Asian countries such as Singapore and Korea launched similar design but with improved material and subsequently captured the market. Had Kenya recognized the need to protect this traditional invention of its poor rural women, the export market would have been sustained for a longer period. Recently also, Tanzania Tea Blenders' famous AFRICAFE instant coffee brand was infringed and pirated by a Kenyan manufacturer. The case may be lost if the Tanzanian company did not register the trade mark in that market. These are Just a couple examples but the lessons they provide with regard to the need to increase awareness on and protect intellectual creations are far reaching, especially in the present information age where knowledge constitutes power and competitive edge over competitors.

7. IPs are being developed to constitute what in commercial terms we call Firm-Specific Assets. These assets must be income generating and potential of being exploited if they are to incentivate the owners in respect of the need to protect them. In Williams[] 986), Intellectual Property is defined as a body of legal rights, economic or moral, which arise from mental and artistic endeavor and or efforts. These legal rights subsequently provide exclusive economic rights in such works.

8. Intellectual Properly rights are of various kinds. They include copyrights, trademarks, patents, layout designs of Semi-conductor Integrated circuits, Trade Secrets and Industrial Designs. The definition and types of IPs have evolved with technological advancements. The advances in information and communication technologies has led to new demands and definitions in the area. Intellectual creations such as computer software, computer programs, computer databases, the development of service and service technology and other inventions in the telecommunication area are indeed not part of the traditional IPRs. These developments have necessitated the formation of new provisions and policies in the agreements that govern IPs.

Copyrights

9. Copyrights are intellectual property rights related to literary and artistic works and are found mainly in the entertainment and publishing industries. These are such as books, novels, newspapers, reference works, poems, live performances, sound broadcast and recordings, film and video recordings, music in print and machine readable form and radio telecommunication, artistic works such as paintings, drawings, photographs and sculptures, architecture, maps and technical drawings. The technological advancement which has engendered inventions in computers and telecommunications has however led to new developments in the area of IPs related to copyrights. Intellectual creations such as computer software/programs, compilations of data or other materials, whether in machine readable or other form, encrypted program-carrying satellite signals have become important assets to the designers and producers of such assets. Authors of such programs have demanded legal protection for fear of piracy and infringement. In the copyrights system authors are given the right to authorize or prohibit the use of such rights by another party. Under TRIPS, copyrights are protected during the life of the owner plus 50 years.

Trademarks

10. Although their role in the transfer of technology has become questionable, trademarks are important firm-specific assets. The Uruguay Round's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) has defined trademarks as consisting of sign, or any combination of sign, capable of distinguishing goods and services of one person from those of another, including names, designs, letters, numericals, colors, figurative elements, or the shape of goods or of their packaging. Trademarks also include service marks and collective marks as well as certification marks. Names such as COCA COLA, KODAK, TOYOTA etc are important assets to the owners. Owners of trademarks or brand names have the right to prevent all persons not having the owner's consent from using in commerce identical or similar signs for goods or services that are identical or similar to those goods or services in respect of which the owners trademark is registered. These rights according to TRIPS agreement will last for 7 years from initial registration and each renewal of registration.

Patents

11. A patent is an exclusive right granted for any new intellectual inventions in respect of products or processes, in all fields of science and technology which involve an inventive step and are capable of industrial applications where an invention of a product is patented, the patent confers oil owner of the patent the right to prevent other persons from making, using or selling the subject matter of the patent, without the patent owner's consent. Similarly, where an invention of a process is patented, the patent confers on the patent owner the right to prevent other persons from using that process and from using, selling or importing at least the product obtained directly by that process, without the patent owner's consent. The rights last for 20 years from the date of application of a patent.

Layout Designs of Semiconductor Integrated Circuits

12. Right holders of layout designs (topographies) of integrated circuits have the right to prevent unlawful importation and sale of such layout designs by unauthorized persons.

13. These rights are protected for 10 years from the date of registration or 10 years from the date of first exploitation.

Industrial Designs

14. The Paris Convention and the TRIPS Agreement define industrial designs as those designs that are independently created and are new or original. That is to say they must differ from known designs or combinations of known design features. Textile designs are one example of industrial designs which are covered under such agreements. WIPO has defined an industrial design as an ornamental or aesthetic aspect of an article which consist of three dimensional features, such as shape or surface of an article, or two dimensional features such as patterns, lines or color. Once registered the right will be protected for ten years.

Trade secrets

15. Given the importance of information, especially in the current competitive era, information has become a strategic asset in modem business. Formerly not recognized as a public right, the TRIPS agreement has defined trade secrets as secret information that must be evidenced in documents, electronic or magnetic means, optical discs, microfilms, films or other similar instruments. Such information is considered secret if it has commercial value.

ROLE AND BENEFITS OF INTELLECTUAL PROPERTY RIGHTS

16. Intellectual property rights are increasingly recognized as being among important assets of many large multinational and other powerful companies, such as the Coca Cola, TOYOTA, Microsoft companies. Companies spent millions of dollars establishing brand names or trademarks to symbolize quality and create customer loyalty to their brands to the exclusion of others. A huge amount of money is also spent on research and development to develop products, processes, designs, and formulas that give companies a competitive edge over competitors. Because of the profits that are generated by owners or users of such intellectual creations, many large and well known companies have experienced pirating, counterfeiting and infringements on their intellectual property rights. Cateora (1996) provides a number of examples of counterfeiting from China alone in the area of books, designs, trademarks, CDs, movies etc. For example, the familiar Red Rooster on the famous brand Kellogg's Corn Flakes appears on Kongalu Corn Strips packages that state "the trustworthy sign of quality which is famous around the world", Colgate in the familiar bright red becomes Cologate or Coalgate. Most products made by Procter and Gamble, Colgate, Palmolive, Reebok and Nike are common subjects of piracy and counterfeiting in Southern China.

17. Intellectual property rights present a number of benefits to the inventors, and to the economy as a whole. Some of the benefits are:

- Income generation to the inventors and users of the invention. Technological inventions take place in anticipation of profits;

- encouragement of domestic innovation, creativity and commitment to research and development by individuals and institutions especially when they know that their inventions are protected;

- encouragement of domestic innovation will lead to technology transfer and therefore expansion of its productive sector. This will lead to employment creation and expansion;

- Intellectual property rights will also lead to export expansion hence generation of foreign exchange which is badly needed in developing countries.

18. To sum up, intellectual property rights contribute to economic growth and hence social and cultural development by creating conditions for the exploitation of such inventions.

COMMERCIALIZATION OF INTELLECTUAL PROPERTY RIGHTS

19. "Technology transfer and commercialization initiatives are the means by which basic research and the marketplace encounter one another and the ideas get transformed into products productive of new business formation" (Downs and Eadie, 1998). This underpins the common view that inventions are not of any economic use if they are not marketed and commercialized. The road to commercialization is rough and frustrating as we observed earlier in this paper. It needs very careful planning, market analysis and evaluation of the various alternatives in respect' of the cost benefit analysis of each option. A number of questions must be answered before any decision to market an invention is taken or even before an invention is registered given that the registration process is at times very cumbersome depending on ones domestic laws. Specifically, evaluation of an intellectual property right will require answers on issues such as whether the invention can be exploited at a profit and the value of the IPR and whether there are potential buyers. This will require an assessment of whether there is a market for the products that will result from the invention, and an assessment of the product life cycle in terms of the period of the product's maturity. If the product will become obsolete within a short period then it is wise not to commercialize the invention. Also if the technology is not environmentally friendly it is obvious that the invention is not an ideal technology.

20. For many years African universities have mainly exploited the copyright system related to the publication of their research findings. Even in this particular area, the policy of most African Universities that encourages their faculty to publish in foreign journals may be detrimental to the development of their own countries as the findings hardly reach the intended population and often the faculty do not benefit much in terms of royalties. It Is thus clear that African universities have done little in the area of patents and industrial designs. It is now acknowledged that African universities will remain relevant and accountable to society if they step up efforts in these other areas. More specifically, they need to work closely with the industry to stimulate technological development and technology transfer. The absence of patents in Tanzania is further corroborated by the applications that are received by the office of Business Registrations and Licensing Agency. It has been reported that about 2000 applications for registration of trade and service marks are received annually from within and outside the country.

21. There are a number of ways universities can market and commercialize their IPRs. This is indeed a very sensitive issue on the part of the universities as it touches on the critical issue of the entrepreneurial university which is still a very controversial subject. More specifically it touches on the issue of the need for universities to become pro-active rather than reactionary. To put the ensuing discussion into the right perspective a review of literature on types of university models and their possible influence on the pro-active or reactionary roles of universities is necessary. Fassin(199 1) and Tent(1991) distinguish between two models of the university- the traditional university and the commercial university. The major distinction between the two models is that commercial universities direct their research towards the technological needs of the productive sector.

Difference between traditional university and the commercial university

Traditional University	Commercial University
- Public funding	Commercial financing
- A preoccupation with traditional scientific	-Specialism within technical areas Area
- Main tasks: training in a wide sense, and Scientific investigation	- Main tasks- professionals training a and commercialization of the Resources
- Type of research: basic	- Type of research: directed towards the companies (tailored research)
- Academic personality: researcher, identified by his/her contribution to the Science	- Academic personality: entrepreneur Interested in the commercialization of his/her product

Source: Intxaurburu and Olaskoaga, 1998

22. According to Inxaurburu and Olaskoaga (op cit), the two university models also differ in their missions and objectives, organizational structures and in their interest and values. The traditional model is preoccupied with long term compared with the short term entrepreneurial approach to practical industrial problems. The traditional university also concentrates on free publication of research results compared with the confidentiality and appropriation of intellectual property common in commercial contexts. The traditional university relies on exhaustive horizontal communication as compared with commercial university structures that encourage fast decision making. Finally “the traditional university is often separated from the economic world, allowing the pursuit of specific non-economic objectives, organizational patterns and cultural values, that are often antagonistic to those which dominate the commercial world”. It therefore very clear that the traditional university model does not encourage entrepreneurship development and growth, while the commercial university model does. Research has further identified a number of other variables which constrain or encourage the development of academic entrepreneurship. The determinants which are related to the academic organization are linkages, both vertical and horizontal, linkages with the commercial organizations and sources of capital, location close to other technology based industries, provision of seed capital and support facilities (incubator), previous demonstration towards academic entrepreneurship, academic excellence and reputation and commercially driven research (Lowe and Taylor, 1998).

23. Given an invention which has economic and commercial value, the inventive university has the following commercialization and marketing options. The decision on which option is feasible will depend on the results of the cost and benefit analysis of each option. Below we present the various options.

Sell the Patent or Industrial Design Rights

24. Although some of the literature tends to associate innovation and entrepreneurship, there is evidence that suggests that many innovators are not entrepreneurs. Subsequently Roberts (1988) has identified "idea havers", and "idea exploiters". It is observed that some idea havers may not be entrepreneurs at all. In view of this, one of the options inventors have is to sell the IPRs to entrepreneurs. This option has no major expense although the returns will be small compared to other options.

Licensing the IPR

25. As in the case of outright sale of Patents, an inventor may not be an entrepreneur. In this case the inventor may enter into a licensing agreement with a licensee, who will commercialize the invention. The inventor enters into a contract with an industrialist in return for royalties. The advantage here is that the license can be given to a number of entrepreneurs. Many entrepreneurs today are manufacturing under license. The famous trade names such as Coca Cola, Kodak, Nike, Mac Donald's etc. have been licensed by the owners. To date many of the users of the Coca Cola trade name do not know the formula.

Joint Ventures or collaboration

26. University researchers can also transfer their technology through joint ventures or collaboration with entrepreneurs. Recognizing their lack of knowledge in commercial activities universities may forge strategic alliances with the business community to exploit their invention. In this case the inventor becomes more pro-active by participating in the production process. Various forms of joint ventures exist. Majority ownership, equal ownership and/or minority ownership or shareholding.

27. The major advantage of joint ventures -is that the university shares the income that accrue from selling manufactured products and benefits from the business knowledge of the entrepreneurial partner. In the case of export markets, the university benefits from the local market knowledge possessed by the local partner. The major problem is that it requires some heavy investment. Many university academics may not have the required resources. Also they may not have contacts with venture capitalists.

Science Parks and Incubator Centres

28. Science parks and incubators are common features within technology based universities and among high technology based firms. Such parks have given birth to a number of spin-offs and/or spin-outs. As is in the case of joint ventures, such centres feature strategic

alliances between universities and high technology firms in the development of technological and marketing knowledge. In a number of countries, the creation of Business and science parks is a policy by local and regional governments to promote technological development of high technology firms.

University Companies

29. On the extreme side, university inventors may opt to establish own business (spin-offs or spin-outs) to exploit their IPRs. Indeed this option requires a lot of resources, both in terms of financial capital and human capital, Given the capital outlay requirements, spin off incidence is quite low. The situation is worse in poor economies. As a result, the question of involvement of university researchers in business creations to exploit their inventions has become a very controversial subject. Starting and growing such companies is not easy as they are subject to all the pitfalls and problems associated with newness. They may not often represent the best option to commercialize IPRs. Some have identified the conflicting attitude between the scientific role and the entrepreneurial role as a clash of cultures which poses a barrier to academics' involvement in commercialization. Despite these conflicting views it is common knowledge that some universities have incubated a number of now large multinational companies. For example, Stanford University and the Massachusetts Institute of Technology (MIT) have incubated large numbers of spin-out firms. The number of companies spinning out of MIT increased from 156 to 636 in twenty years'. Within a period of 50 years, MIT has transformed the economy of the state from its traditional dependence on textile and footwear to its current high technology base. In the UK, Oxford Glycosystems, Oxford Instruments have spun out of Oxford University and Cambridge Instruments from Cambridge university. The majority of the academics who established own businesses retained their academic appointments at the same running their establishments, thus making double contribution.

30. In Sweden, Chalmers University of technology has spun out 240 companies within 0 years. Perhaps a number of factors influence the propensity to establish and develop spin out companies by university researchers. Foremost is the characteristics of the academic environment as we alluded to in our earlier discussion, the academic infrastructure, and the linkage with the industry or the business community. Some research evaluation schemes of universities as is practiced in the U.K. have been criticized for their inclination towards publication of papers rather than on the practical application of the research. It has been observed that most African universities have fallen prey to such evaluation Schemes and systems in view of their previous connection with these colonial universities.

31. The question that remains to be answered is how can African universities stimulate invention" It Is common knowledge that African universities research activities are underfunded. But even where they may be funded African universities lack awareness on the benefits of intellectual property rights. An IPR policy and infrastructure are also lacking. As a result, these institutions have lost a lot of money.

32. It is clear that if African universities are to benefit from IPRs they need to provide an infrastructure which can stimulate invention. Foremost, public funding as well as private funding must be improved. The vicious circle of low funding, low R&D activities, low invention and low income cannot be broken unless funds are injected in these institutions.

THE ISSUE OF PROTECTION OF INTELLECTUAL PROPERTY RIGHTS

33. Property rights can only be protected if they are registered under the country's law. Although a number of conventions and agreements exist each country maintains its own laws. The Uruguay Round Agreement on Trade Related Intellectual Property Rights (TRIPS) require nations to reform their laws so that they conform to the provisions of the international agreement.

READINGS

Downes, R and Eadie, G (1997) The creation and support of academic "spin out" companies. Papers presented at the High Technology Small Firms Conference, Manchester, 29-30 May.

Fassin, Y. (1990) Academic ethos versus business ethics, International Journal of technology Management,6,516, pp533-46

Intxaurburu, G and J. Olaskoaga (1998) Bridging the gap between University and Industry- a study of the Industrial Liaison Function in Sweden and Ireland, in Oakey, R and W. During, (eds) New Technolok-based Firms in the 1990s Volume V,
Lowe, J and P. Taylor (1998), Technology Purchase and technology Development in SMEs Public Policy and practical Problems

Tent, H. (1991) University-based government interaction: the view from Europe, International Journal of technology management, 6 516, pp526-32

UNESCO, (1995) Policy paper for change and development in higher education Geneva.

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