

## 6.3 The Innovation Landscape of South Africa under new Intellectual Property Management Policy

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### ABSTRACT

*The new intellectual property (IP) policy currently under development by the Department of Trade and Industry will likely define the future innovation landscape in South Africa. This is in line with the direction the country has taken i.e. transforming its economy from resource-dependent to knowledge-based. Accompanied by this strategy is the increased economic value of intellectual property. Through the Intellectual Property Rights from Publicly Financed Research and Development Act (Act No. 51 of 2008), South Africa has forever transformed the innovation landscape by ushering in clear guidelines for the use and management of IP which emanate from government-funded research. While this step was applauded, the approach to organise and manage all aspects of IP seemed to be coordinated without the required due diligence. This led to the decision made by the Department of Trade and Industry to develop an Intellectual Property Rights (IPR) policy. The IPR policy seeks to align the IP environment with the development imperatives of the country. This paper analyses the likely impacts of the policy in South Africa, and attempts to assess its potential unintended effects. The paper also discusses the likelihood of increased awareness of the importance of IP altering academic excellence in South Africa.*

### 1. INTRODUCTION

The intellectual property environment of South Africa is due for substantial changes (Arsocena & Sutz, 1999; Simelane, 2010). These changes will be ushered in through the ongoing review of IPR laws and the development of a new IRP system. Intellectual property rights and the acknowledgement thereof is one of the basic mechanisms through which a country creates a favourable environment for innovation (Cohen & Levinthal, 1989; Djeflat, 2012).

In 2008, South Africa passed into law the Intellectual Property Rights from Publicly Financed Research and Development Act (IPR-PFRD Act) (Simelane, 2010). This signalled the beginning of a new era where the protection and effective management of IP by government-funded institutions was encouraged for the benefit of the state, its organs and its citizens. The IPR-PFRD Act, which is based on the USA Bayh-Dole Act, provides guidelines for the effective management of IP emanating from publicly-financed research which in turn establishes the foundation of a new framework for research, innovation and development in South Africa.

Through South Africa's ten year innovation plan, 'Innovation towards a knowledge-based economy', South Africa set itself the ambitious objective of transforming the country's economy from natural resources to knowledge-based resources. This strategy, together with the IPR-PFRD Act, represents a leap towards stimulating innovation and economic development through the identification of opportunities for commercialisation of IP that arises from public investment on research.

With these initiatives and the associated positive spin-offs, it has, however, been realised that the development and management of IP in South Africa is not harmonised or well-coordinated, and a decision was made to re-align the South African IP environment by introducing a new IP administration and management system to its research and innovation community. The intention is to create an IP environment which is in line with the development imperatives of the country. Furthermore, South Africa seeks to promote innovation that will lead to economic growth and development.

Historically, the IP system in South Africa has not taken into account the economic status of the country. Through the review of the IP system and environment, South Africa seeks to:

- ▶ Develop a legal framework on intellectual property (IP) that will empower all strata of its citizens
- ▶ Create an environment favourable to seizing economic opportunities, and which is directed towards empowering all South African citizens
- ▶ Efficient application of the IP system alongside other government policies in order to contribute to economic development
- ▶ Develop an IP policy that interfaces with other relevant emerging issues
- ▶ Improve and strengthen enforcement mechanisms on the IP that will suit all sectors of the IP community
- ▶ Improve access to IP-based essential goods and services, especially education, health and food

- ▶ Increase access to foreign and local technology through regular interaction and collaboration with local firms and research institutions
- ▶ Promote research, development and innovation throughout the South African economy at private institutions, research institutions and individual members of society
- ▶ Enhance and strengthen the role and function of IP regulatory and registration departments in order to improve public service delivery
- ▶ Improve national compliance with the international treaties of which South Africa is a signatory
- ▶ Promote public education and awareness of IP

This paper aims at assessing South Africa's potential innovation strength to create an IP-conducive environment through the new IPR policy, and evaluating the impact of changes to the management of IP by:

- ▶ South Africa's alignment of its IP laws with the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS),
- ▶ South Africa's obligations towards protecting IP, and
- ▶ The effects of the IPR-PFRD Act on research, development and knowledge dissemination.

## **2. INTENDED EFFECTS OF THE NEW IP POLICY**

The purpose of the new IP policy is to ensure that it complements other national policies seeking to promote innovation and economic development, as well as instruments used to regulate the IP environment. At the moment, the IP environment of South Africa is regulated by four types of instruments i.e. trademarks, copyright, patents and designs. In addition, instruments such as geographical indicators, trade secrets and data protection regulations are currently in existence although not formally included in the mainstream regulatory environment.

### **2.1 Trademarks**

A trademark is a method of branding products that both identifies and distinguishes itself from the products of others. The Banjul Protocol on Marks was adopted in 1993 in Banjul, Gambia and came into force on March 1997 (du Plessis et al., 2012). In South Africa, intellectual property, which is linked to trademarks, is protected by the Trade Marks Act (Trade Marks Act No. 194 of 1993). The Act provides for the registration of trademarks in respect of goods and services (du Plessis et al., 2012). Trademarks can be in the form of words, names, symbols, sounds or any combination of these. While the existence of a trademark can be used to prevent others from using the same, or highly similar marks, it cannot be used to prevent competitors from selling the same goods or services. However, the protection afforded by trademark registration extends to the use of an identical mark or a mark so nearly resembling it as to be likely to mislead or cause confusion (du Plessis et al., 2012). Trademarks can be protected for as long as they are in use.

### **2.2 Copyright**

Copyright protects the creators of 'original works of authorship', whether or not these works have been published. Subject matter eligible in this category of IP includes literary works, musical works, artistic works, cinematograph films, sound recordings, broadcasts, programme-carrying signals, published editions and computer programs (du Plessis et al., 2012). The copyright owner has exclusive rights to make copies, author-derivative works and perform or display the work publicly. Copyright protection is limited to the form of expression a work takes and does not cover the subject matter. In South Africa, copyright is granted to the copyright holder and regulated through the Copyright Act (Copyright Act No. 98 of 1978) and Copyright Regulations of 1978. Copyright is automatically conferred on the work eligible for copyright at the time of creation or when published for the first time (du Plessis et al., 2012).

As noted by du Plessis et al. (2012), the following requirements govern the conferring of copyright:

- ▶ The work must be original and reduced to material form.
- ▶ The author must at the time the work is created, be a qualified person (or in the case of joint authorship, one of the authors) - this means in the case of an individual, a person who is a citizen of South Africa or a Berne Convention country.

Unlike other instruments, the validity period of a copyrighted product/item is not less than fifty years. The author of a copyrighted product/item is usually the person who makes or creates the work (du Plessis et al., 2012).

### **2.3 Patents**

A patent can be described as a bundle of rights granted to the inventor of a new product or process that allows the inventor to exclude third parties from making, using, offering for sale, selling or importing a product made with the patented process for a period of 20 years from the date of filing (Sternitzke, 2008).

Patent protection is obtainable by means of national filing (du Plessis et al., 2012). A patent confers on the patentee for the duration of the patent the right to exclude all other persons from making, using, exercising, disposing of or offering to discard, or importing the patented invention, so that the patentee shall have and enjoy the whole profit and advantage accruing by reason of the invention (du Plessis et al., 2012). Patents are territorial in nature and are affected or moulded by policies of the countries that have granted it. In South Africa patents are granted and protected through the Patents Act (Patents Act No. 57 of 1978) and regulated through the Patent Regulations of 1978. The Act provides for conventional patents i.e. where the patent holder of a main patent applies for a further patent in respect of any addition to, or improvement in, or modification of the main invention (du Plessis et al., 2012). It also provides for patent of addition and divisional patents (du Plessis et al., 2012).

South Africa is a member of the Paris Convention, the Budapest Treaty, the Patent Cooperation Treaty (PCT) and the WTO/TRIPS. In terms of TRIPS, a country is expected to assume a policy position around issues such as 'compulsory' and voluntary licensing, and parallel importation. These issues are relevant for accessibility and affordability of medicines. In the current SA Patent Act of 1978, parallel importation is not catered for, whilst compulsory licensing is not informed by the current Doha Decision on Public Health and Intellectual Property under the World Trade Organisation (WTO) processes of the development agenda. The Patents Act as it stands therefore does not address issues of pricing medicines. This is not sufficient to deal with drug shortage and the ever-increasing prices of drugs.

## **2.4 Designs**

Design is the creation of a plan or protocol for the construction of an object or a system. Designs have different connotations in different fields. Design protection is obtained by the filing of an application for registration (du Plessis et al., 2012). The effect of a design registration is to grant to the registered proprietor the rights for the duration of the registration, to exclude other persons from making, importing, using or disposing of any article included in the class which the design is registered (du Plessis et al., 2012). In South Africa, this class of IP is protected and regulated by the Design Act No. 195 of 1993 and the Design Regulations of 1999 (du Plessis et al., 2012). The Act provides for two types of designs i.e. an aesthetic design, which is defined to mean a design applied to an article, whether for the pattern or shape of the configuration or the ornamentation thereof (du Plessis et al., 2012), and a functional design, which is defined to mean a design applied to an article, whether for the pattern of the shape of the configuration thereof, and by which means it is applied, having features which are necessitated by the function which the article is to perform and include an integrated circuit topography, a masks work or a series of mask works (du Plessis et al., 2012).

## **3. HOW THE PROTECTION OF INTELLECTUAL PROPERTY INFLUENCES INNOVATION: LESSONS FROM SELECTED INTERNATIONAL SUCCESS STORIES**

It can be argued that the increased awareness of the importance of intellectual property rights has brought some perturbations among the academic institutions. There is a massive outcry that IPR increased individualism and counter-accusations. This is not unique to South Africa. International trends demonstrate that, in an environment where rate of innovation is high, counter-accusations of IP theft are common. This is further elaborated on in the following examples (extracted from Wikipedia, <http://en.wikipedia.org>) of successful innovation that have changed the world:

### **3.1 Microsoft**

The idea of Microsoft germinated when Paul Allen showed Bill Gates the January 1, 1975 issue of Popular Electronics that demonstrated the Altair 8800. Allen and Gates saw potential to develop an implementation of the programming language BASIC for the system. Bill Gates contacted the creators of the new microcomputer, MITS (Micro Instrumentation and Telemetry Systems), offering to demonstrate the implementation in order to secure a contract with the company. Allen and Gates had neither an interpreter nor an Altair system, yet in the eight weeks before the demo they developed an interpreter. When Allen flew to Albuquerque, New Mexico to meet with MITS, the interpreter worked and MITS agreed to distribute Altair BASIC. Allen and Gates left Boston, where Allen worked for Honeywell and Gates was enrolled in Harvard, moved to Albuquerque (where MITS was located), and co-founded Microsoft there. Since then, Microsoft has grown to be one of the internationally leading software companies in the world (<http://en.wikipedia.org/wiki/microsoft>).

### **3.2 Google**

Google began in March 1996 as a research project by Larry Page and Sergey Brin who were PhD students at Stanford working on the Stanford Digital Library Project (SDLP). The SDLP's goal was "to develop the enabling technologies for a single, integrated and universal digital library", and received funding from the National Science Foundation, among other federal agencies. In search of a dissertation theme, Page considered exploring the mathematical properties of the World Wide Web, understanding its link structure as a huge graph. His supervisor, Terry Winograd, encouraged Page to focus on the problem of finding out which web pages link to a given page, considering the number and nature of such back links to be valuable information about that page - with the role of citations in academic publishing in mind. In his research project, nicknamed 'Backrub', he was soon joined by Sergey Brin, a fellow Stanford PhD student supported by a National Science Foundation Graduate Fellowship.

Brin was already a close friend, whom Page had first met in the summer of 1995 in a group of potential new students which Brin had volunteered to show around the campus. Page's web crawler began exploring the web in March 1996, setting out from Page's own Stanford home page as its only starting point. To convert the back link data that it gathered into a measure of importance for a given web page, Brin and Page developed the PageRank algorithm. Analysing BackRub's output—which, for a given URL, consisted of a list of back links ranked by importance—it occurred to them that a search engine based on PageRank would produce better results than existing techniques. Originally the search engine used the Stanford website with the domain [google.stanford.edu](http://google.stanford.edu). The domain [google.com](http://google.com) was registered on 15 September 1997. They formally incorporated their company Google Inc. on 4 September 1998 at a friend's garage in Menlo Park, California (<http://en.wikipedia.org/wiki/google>).

### **3.3 Yahoo!**

Yahoo! was started in a Stanford University campus trailer. It was founded in January 1994 by Jerry Yang and David Filo, who were Electrical Engineering graduate students when they created a website named Jerry and David's Guide to the World Wide Web. The guide was a directory of other websites, organised in a hierarchy, as opposed to a searchable index of pages. In April 1994, Jerry and David's Guide to the World Wide Web was renamed Yahoo! The [yahoo.com](http://yahoo.com) domain was created on 18 January 1995. Yahoo! grew rapidly throughout the 1990s and diversified into a web portal, followed by numerous high-profile acquisitions (<http://en.wikipedia.org/wiki/yahoo>).

### **3.4 Facebook**

In January 2004, Mark Zuckerberg began writing the code for a new website, known as 'thefacebook'. He said in an article in The Harvard Crimson that he was inspired to make Facebook from the incident of 'Facemash'. On 4 February 2004, Zuckerberg launched 'TheFacebook', originally located at [thefacebook.com](http://thefacebook.com). Zuckerberg also stated his intention to create a universal website that can contact people around the university. Just six days after the launch of the site, three Harvard University seniors, Cameron Winklevoss, Tyler Winklevoss, and Divya Narendra, accused Zuckerberg of intentionally misleading them into believing that he would help them build a social network called HarvardConnection.com, but instead using their idea to build a competing product. The three complained to the Crimson, and the newspaper began an investigation. Zuckerberg knew about the investigation, so he used TheFacebook.com to find members on the site who identified themselves as members of the Crimson. He examined a history of failed logins to see if any of the Crimson members have ever entered an incorrect password into [thefacebook.com](http://thefacebook.com). In the cases in which they had failed to login, Mark tried to use them to access the Crimson members' Harvard email accounts, and he was successful in accessing two of them. In the end, three Crimson members filed a lawsuit against Zuckerberg which was later settled (<http://en.wikipedia.org/wiki/facebook>).

### **3.5 HIV**

The story around the fight between Robert Gallo of NCI laboratory and Luc Montagnier of Pasteur Institute as to who first discovered the Human Immune Virus is well known (Horowitz, 1999). This led to a stalemate between France and America that was only resolved through political agreement between the two countries. This clearly shows the seriousness of the importance of defining the ownership of IP.

As could be derived from these examples, one can see that innovation and protection of intellectual property are closely linked. As such, counter-accusations of the theft of IP are an unintended consequence of enhanced IP awareness and management. However, despite this, examples presented here demonstrate that successful innovation is a result of curiosity, good academic supervision and effective collaboration. These characteristics have emerged from South Africa's system of innovation through the establishment of centres of excellence and emphasis on excellent supervision.

## **4. NOTABLE CHANGES IN THE IP ENVIRONMENT IN SOUTH AFRICA**

### **4.1 TRIPS related changes**

Since its adoption, TRIPS (Trade Related Aspects of Intellectual Property Rights) has been faced with a myriad of challenges (Huala, 2001). Key among these challenges were accusations that developed countries enforced on TRIPS the protection of the superiority of their companies. This led to strikes and resistance in South Africa with allegations that TRIPS serves as a vehicle for developed countries to capitalise on profits provided by life-threatening diseases such as the Human Immune Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS).

### **4.2 IPR Act and its impact**

While the Act can be regarded as a source of hope for success in terms of ensuring innovation, technology transfer, commercialisation and the development of entrepreneurship among the academic institutions, it has triggered a number of changes within academic institutions, and this effect cannot be underestimated.

The Act requires that institutions of higher learning establish Technology Transfer offices. These offices must ensure the effective management of IP generated funds obtained through scientific publications. As a set procedure, researchers within academic institutions are now expected to seek permission and declare outputs to their Technology Transfer offices before publishing their results in journals, books or making presentations at conferences. This led to a time lag between the evaluation and issuing of permission, and publication of the results, in accredited journals. Subsequently, the scientific vigour of research and its contribution to knowledge dissemination has declined.

## **5. OTHER CHANGES THAT REQUIRE ATTENTION**

At the level of a researcher, the IPR Act can be interpreted in many ways. For those who are worried about technology transfer between academic institutions and the private sector, the Act appears to be encouraging. For those who expressed concern about academic/university/private sector relations, the Act seems less favourable.

The purpose of IP protection is to support cognitive processes; encourage innovation; and guarantee that the inventor receives a benefit for his/her invention. Most stakeholders are in agreement that the knowledge commons require timely submission and publication of results, open communication among researchers, and full access to research methodology documentation for the purpose of replication. The critical issue of concern is the decline in the availability of information to the public from research sponsored by the government. Key issues that still need to be resolved include:

### **5.1 Lack of defined technology transfer models**

Although the Act provides some direction on the rights of IP creators in institutions to encourage sharing, it lacks clarity on the models and procedures to be followed when transferring technology between the institutions. Most small and medium enterprises in South Africa lack capacity to conduct their own research. There exists a definite need to clarify how beneficiaries should manage the continual development of inherited technologies in order to remain profitable and up-to-date.

### **5.2 Management of non-patentable and patentable unused knowledge**

The Act assumes that all knowledge produced through publicly-funded research is patentable. However, the possibility exists that not all knowledge and/or research outputs from publicly-funded research will be publishable. Some of results/ outputs could be essential for laying a firm foundation for future research and would therefore require some degree of protection. On the other hand, some of the patentable outputs/products might be likely to fail in making a breakthrough in the market. There is a need for clarity on how such situations should be handled.

### **5.3 Lack of clarity on expected responses from institutions other than those mentioned in the Act**

It could be argued that the Act falls short in providing clarity on the roles and responsibilities of institutions responsible for the storage and dissemination of knowledge. These institutions play a pivotal role in knowledge management, thus, clarity on the role and function of such institutions needs to be developed.

## **6. FUTURE CONSIDERATION FOR INTELLECTUAL PROPERTY MANAGEMENT AND INNOVATION IN SOUTH AFRICA**

Through changes to the IP system in South Africa, the country succeeded in create a favourable environment for innovation. However, most academic institutions are still trapped in the 'publish or perish' mindset of defining academic excellence. One wonders when this will change so that a culture of innovation and creation of patentable knowledge in academic institutions can be promoted.

It is evident that the increased awareness of IP among academic institutions led to two unintended effects. Firstly, competition characterised by counter-accusations intensified, and secondly, competing priorities between maintaining academic excellence and promoting the production of patentable knowledge, has been created.

Academic excellence is primarily defined and measured by the number of publications an academic or researcher is able to deliver. Among academics, the number of post-graduate students one is able to supervise or deliver is another key requirement. Little emphasis is placed on the number of patents a researcher is able to register.

Changing this situation will require both a mindset and an attitude change. A clear separation between an academic who is expected to teach and supervise students, and those required to generate patentable knowledge/outputs/products, is needed. This is what will define the future direction of innovation within the new IP environment in South Africa.

## 7. CONCLUDING REMARKS

The current environment for innovation seeks to promote knowledge development for the purpose of promoting academic excellence. This is supported by the requirement that academics need to publish, supervise and deliver a specified number of post-graduate students within a given time period. All these requirements are central to obtaining National Research Foundation (NRF) rating. As it appears, little emphasis is placed on the generation of patentable knowledge.

According to the Act, and through the newly-established Technology Transfer offices at institutions of higher learning, researchers/academics who receive funding from the government are compelled to ensure that the research outputs/results they generate, be screened for possible patenting. This requirement however lacks substance as there are little chance that patentable information could result from research methods that were designed to promote academic excellence and student throughput.

Research design that does not make provision for patentable outputs will most likely not deliver patentable knowledge. The Patent Act offers a clear definition of the term 'patentable'. Novelty and inventiveness are at the core of the patent Law. In order for an invention to be patentable, it must be new and it must involve an inventive step.

According to the Patent Act, an invention will be new if it did not form part of the state of the art at the time of the application. The state of the art is defined as "comprising all matter that has been made available to the public by way of written or oral description or by use or any other ways", and it will involve an inventive step.

This poses a dilemma between conducting research for academic excellence and research for innovation and invention. Most universities emphasise conducting research for publication and student training. The question that can be asked is how to establish a fair balance between the two approaches. Should academic institutions change their research emphasis and approach? If yes, many academics/researchers might lose their rating at the NRF (a research body which also emphasises publishing in accredited journals as a way of demonstrating academic excellence).

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