

deadly.
innovation

An **innovation** is a
of doing something

licensing, copyright
idea, creation, guidance
patents, brands, counseling
invention, novelty, innovation
+ authorship, trademarks

intellectual property

Intellectual Property for Fostering Innovation in the Arab Region



Shared Prosperity Dignified Life





Shared Prosperity **Dignified Life**



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ESCWA, an innovative catalyst for a stable, just and flourishing Arab region

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Intellectual Property for Fostering Innovation in the Arab Region



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Executive Summary

In today's technology- and knowledge-driven economy, intellectual property (IP) is an important legal structure. IP policies play a key role in the management of research and development and enhancing innovation and entrepreneurship. Intellectual property rights are part of a complex regime of bilateral, regional and multilateral treaties that has been evolving since the nineteenth century.

While IP rights are recognized and have existed in their modern form in the Arab world since the beginning of last century, today only few Arab countries have a national intellectual property strategy with measures to encourage and facilitate the effective development, management and protection of intellectual property rights. However, compared to other intellectual property markets such as Europe and the United States, intellectual property rights protection and exploitation in the Arab region have plenty of room for growth and improvement.

Over the last twenty years, tremendous efforts have been made in this direction. Intellectual property legislation in Arab countries have been developed in cooperation with the World Intellectual Property Organization (WIPO), within the framework of the World Trade Organization (WTO) or through bilateral agreements, to ensure compliance with their commitments under the Trade-Related Aspects of Intellectual Property Rights (TRIPS) and on the international

landscape. Arab legislation has also been maintaining the effort to restrict counterfeiting and piracy by developing successful partnerships between the public and private sector.

However, for emerging market economies in this knowledge-based era, growth and economic development is driven by the innovation and creative processes for products and services. A balanced design of managed intellectual property rights leading to temporary monopolies can yield such an outcome. Without the legal rights to appropriate the returns from innovations, the incentives to engage in inventive and creative activities are likely to decline. In this regard, a balance incentivizing innovation versus improving access to technology to promote diversification must be struck. Several factors contribute to the framework conditions for strengthened intellectual property rights protection that supports, with other factors, the Arab region's journey towards innovation, international trade and foreign investment.

This report is a desk review of the intellectual property laws and practices – specifically the patent and copyright fields – of some countries in North Africa, the Middle East and the Gulf. Examples from other countries are added where appropriate to illustrate the links between intellectual property, innovation, competitiveness, and the progress towards achievement of the Sustainable Development

Goals in the Arab region or to show best practices for addressing specific challenges in the IP systems.

The report proposes some practical solutions to the dilemma of balancing strong intellectual property protection that could harm the public interest, especially concerning the

dissemination of knowledge, and a weak intellectual property system which, by failing to encourage researchers to innovate, is not sustainable and stifles innovation. It proposes an evaluation tool for IP systems, enabling authorities to determine the effectiveness and gaps in systems from inception of a protective work to its commercialization.

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List of Abbreviations

AdTech	Advertising Technology
ACTA	Anti-Counterfeiting Trade Agreement
ARIPO	African Regional Intellectual Property Organization
ASRT	Academy of Scientific Research and Technology
AUB	American University of Beirut
AUC	American University in Cairo
BIRPI	Bureaux Internationaux Réunis pour la Protection de la Propriété Intellectuelle
CIPO	Canadian Intellectual Property Office
CMO	Collective management organization
CNRS	National Council for Scientific Research
EGM	Expert Group Meeting
EGPO	Egyptian Patent Office
EU	European Union
FTAs	Free Trade Agreements
GAFTA	Greater Arab Free Trade Area
GATT	General Agreement on Tariffs and Trade
GCC	Gulf Cooperation Council
GCI	Global Competitiveness Index
GDP	Gross domestic product

GII	Global Innovation Index
ICC	International Chamber of Commerce
IDCAS	Industrial Development Centre for Arab States
IP	Intellectual property
IPPO	Intellectual property protection office
IPRs	Intellectual property rights
IPTL	IP and technology licensing programme
KACST	King Abdulaziz City for Science and Technology
KIPO	Korean Intellectual Property Office
LAS	League of Arab States
LDC	Least Developed Country
MENA	Middle East and North Africa
MSMEs	Micro-, small- and medium-sized enterprises
NIE	National Innovation Ecosystem
NIS	National innovation strategy
OAPI	Organisation Africaine de la Propriété Intellectuelle
OMPIC	Office Marocain de Propriété Industrielle et Commerciale
PCT	Patent Cooperation Treaty
R&D	Research and development
SaaS	Software as a service
SACEM	Société des Auteurs, Compositeurs et Editeurs de Musique
SAIP	Saudi Authority for Intellectual Property

SDGs	Sustainable Development Goals
SMEs	Small and Medium Size Enterprises
SPO	Saudi Patent Office
STEM	Science, technology, engineering and mathematics
STI	Science, technology and innovation
SWOT	Strengths, weaknesses, opportunities, threats
TICs	Technology and innovation centres
TM	Trademark
TPP	Trans-Pacific Partnership
TRIPS	Trade-Related Aspects of Intellectual Property Rights
TT	Technology transfer
TTU	Technology transfer unit
UNCTAD	United Nations Conference on Trade and Development
UNIDO	United Nations Industrial Organization
WCT	WIPO Copyright Treaty
WHO	World Health Organization
WIPO	World Intellectual Property Organization
WPPT	WIPO Performances and Phonograms Treaty
WTO	World Trade Organization

Introduction

In today's technology- and knowledge-driven economy, intellectual property (IP) is a crucial legal structure. It protects the human intellectual investment which has a major role in contributing to a nation's sustainable development.¹ IP relates to the regulation and organization of the founding pillars of the information society and the knowledge economy, namely, innovation and creativity.

Intellectual property rights (IPRs) are part of a complex regime of bilateral, regional and multilateral treaties that have been evolving since the nineteenth century. They are further supported by many mechanisms and factors that assist theorists, lawmakers and policymakers in their response to the challenges of current realities, such as the formulation and implementation of strategies and policies to encourage progress and development. IP policies play a key role in research and development (R&D) management and enhancing innovation and entrepreneurship.

Compared to many developed regions, the Arab region does not have a history of prioritizing IP rights. This probably reflects the fact that developing countries, including Arab developing countries, were not represented in the Paris Convention for the Protection of Industrial Property, signed in 1883. They also did not take part in the norm-defining processes that created the existing international industrial property protection system. Some Arab

countries perceive that the concept of intellectual property is based in Western culture, giving precedence to Western interests and the needs,² while promoting ideas and concepts potentially incompatible with circumstances in Arab countries. Even though this observation was made in 2001, it remains relevant and is included in reports such as the United States Trade Representative 2018 Special 301 Report³ that puts four Arab countries, Egypt, Lebanon, Saudi Arabia and the United Arab Emirates, on the watch list two others countries, Algeria and Kuwait, on the priority watch list.

Compared to other IP markets such as Europe and the United States, IPRs protection and exploitation in the Arab world have plenty of room for growth and improvement. Over the last twenty years, tremendous efforts have been made in this direction. Intellectual property legislation in Arab countries have been developed in cooperation with the World Intellectual Property Organization (WIPO), within the framework of the World Trade Organization (WTO) or through bilateral agreements, to ensure compliance with their commitments under the Trade-Related Aspects of Intellectual Property Rights (TRIPS) and before the international scene. They also have been maintaining the efforts to restrict counterfeiting and piracy by developing successful partnerships between the public and private sector. Although IPRs are not regulated by Islamic law and jurisprudence per se, the

sources, objectives and principles of Islamic sharia are used to link concepts moulded by social, legal and scientific developments to communities whereby Islam guides culture and law-making.⁴

However, growth and economic development is driven in this knowledge-based economy era by innovation and creative processes and requires a balanced design of IPRs. If the legal right to profit from innovations is not available, it may lead to a decline in the motivation to participate in inventive and creative activities. Several factors contribute to the conditions for a strengthened framework for IPRs protection that could make the Arab world attractive for innovation, international trade and foreign investment.

Notwithstanding the advances made in general, the gender gap in IPRs persist, both worldwide and in the Arab region. Although the percentage of women's patent applications have increased worldwide, women remain less likely to hold patents than their male counterparts. The gap in IPRs could have far-reaching impact on economic empowerment of women, their business success and availability of funding for them. It is therefore necessary to consider gender when working on frameworks that could strengthen IPRs both worldwide and in the Arab region.

This report is a desk review of the IP laws and practices – specifically patents and copyright – of some countries in North Africa, the Middle East and the Gulf. Examples from other countries are added where appropriate to illustrate the relations between IP, innovation, competitiveness and the progress towards and achievement of the Sustainable Development Goals (SDGs) in the Arab region.

The report contains five chapters:

Chapter 1 sheds light on the evolution of intellectual property in the Arab world by highlighting the legal framework before and after TRIPS Agreement, the international conventions and agreements. This chapter could be skipped by readers who are not interested in this subject.

Chapter 2 focuses on the relationships between innovation, technology and IP by showcasing their economic and environmental impacts. It also describes the standing of IPRs in the Arab region innovation ecosystem and shows the importance of patenting for academia and public research. The chapter discusses the relationship between strong and weak IP systems and their arguable impact on innovation, technology transfer and development. This chapter shows the contribution of copyright to innovation and its importance on employment, technology innovation and the gross domestic product (GDP), and highlights the copyright laws in the Arab region.

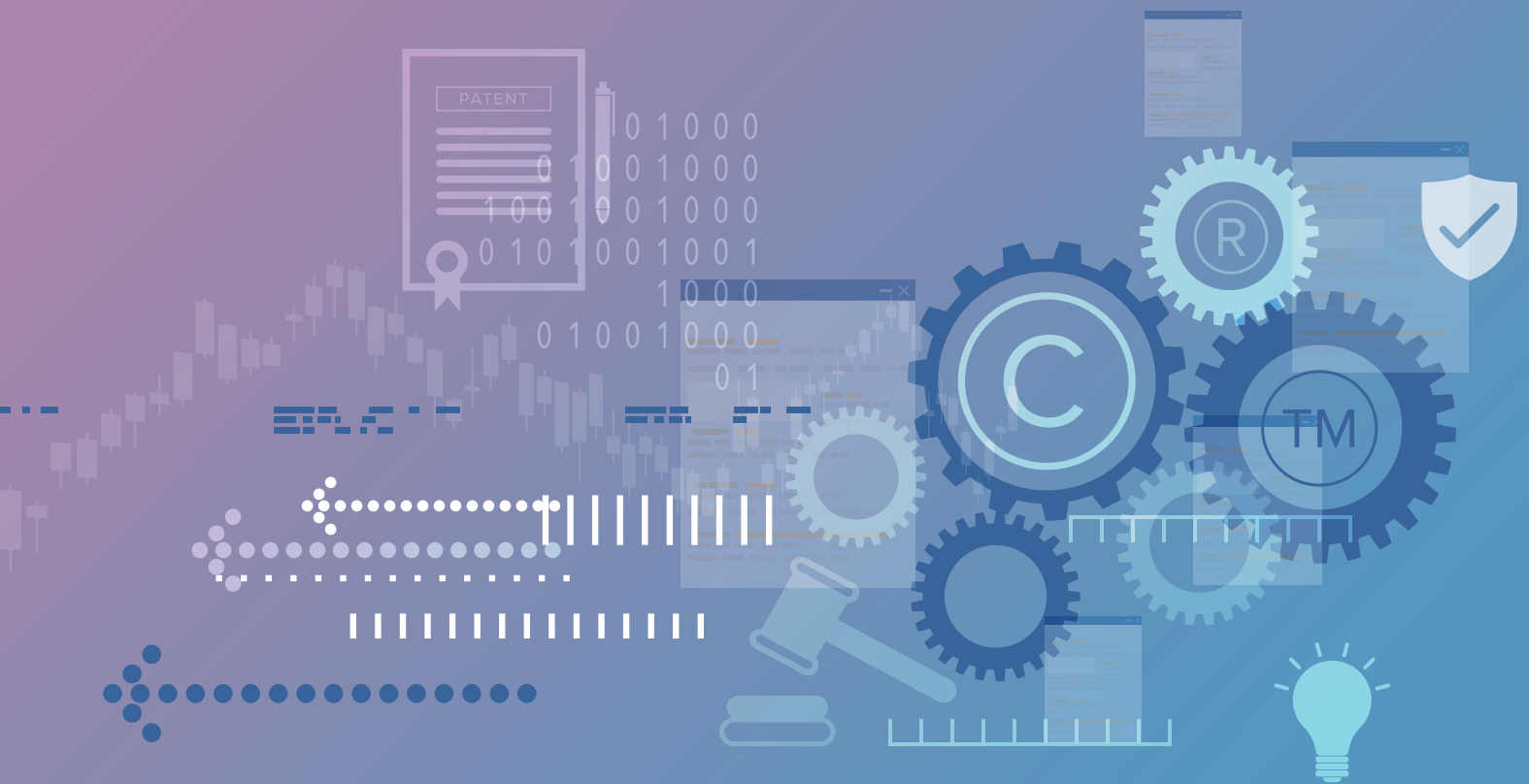
Chapter 3 sets the scene of the current management of IPRs in the Arab region and specifically in six countries: Egypt, Lebanon, Mauritania, Morocco, Oman and Saudi Arabia. Countries were selected to represent multiple geographic areas and different levels of GDP in the Arab region. The description of IP system focuses on the administration and enforcement of IPRs, the generation of IP by universities or researches and management of IP. The chapter indicates regional initiatives that were implemented in the Arab region, and it concludes with an analysis of the strengths, weaknesses, opportunities, threats (SWOT) of IP systems in the Arab region.

Chapter 4 proposes solutions to address specific challenges of IP systems based on selected best practices from developed and developing countries. The challenges include raising awareness about IP, encouraging women to innovate, formulating and implementing national IP strategy, enhancing the administration and the enforcement of IP. The chapter ends by proposing a template for the evaluation of IP system in Arab countries.

Chapter 5 presents a conclusion on today's IP situation in the Arab region and provides

recommendations for IP threats or weaknesses for the purpose of implementing IP in the right places to expand its enforcement in the Arab region.

The report complements ESCWA's work related to innovation policy for sustainable development,⁵ technology transfer and the establishment of technology transfer offices in Arab countries⁶ as well as its reports related to innovation and entrepreneurship for Arab youth and women.⁷



1. Evolution of the Intellectual Property Systems in the Arab Region



1. Evolution of the Intellectual Property Systems in the Arab region

IPRs are recognized and have existed in their modern form in the Arab region since the beginning of the nineteenth century. They provide real protection for intellectual creations such as industrial property. In some countries patents and trademarks are more significant than other IPRs. In countries where copyright creations are abundant, literary and artistic property contributes more to the economy than the industrial property. Without opening the debate on whether IPRs are universal norms and human rights or monopolies, these rights in the Arab region are granted to all and women are not excluded. Today, only a few Arab countries have a national IP strategy which is a cross-cutting document formulated and implemented by governments, outlining connections with various policy areas to guarantee effective synchronization. An IP strategy consists of measures, at national level, to encourage and facilitate the successful development, management and protection of IPRs. Morocco, Oman, Saudi Arabia and the United Arab Emirates have all formulated strategies, while one is currently being formulated in Lebanon. Arab countries are all members of IP-related international conventions to various extents,⁸ while parts of their statutes comply with TRIPS provisions.

A. Legal framework before the enactment of the TRIPS Agreement

Over the last five decades, most of the Arab countries have undertaken thorough and increased codification of laws. At the national level, the IPRs protection increased effectively in the Arab region. In some countries such protection did not exist before: for instance, in the 1970s none of the Gulf States had laws protecting copyright and neighbouring rights⁹ or subscribed to any international or regional convention on literary and artistic property. Two phases, pre- and post-independence can be observed in the development of the IP laws during the pre-TRIPS era.

Some IP laws were enacted during a period of a foreign control before independence. For instance, the Lebanese Industrial Property Law of 1924; Bahrain Patents, Industrial Designs and Trade Marks Regulation of 1955; or the Industrial Property regulation of 1958 in Kuwait. Later, some laws were developed as part of a post-independence codification of commercial and civil laws incorporating some IP provisions, such as Kuwait, being the first of the British protectorates in the Gulf to achieve independence on 19 June 1961. The pre-independence laws in the Arab countries were

generally a subordination to, or transplantation of, laws or regulations already in existence in other jurisdictions. Such laws or regulations were not directed towards purely domestic operation at a local level, except to the extent that they impacted on foreigners' and expatriates' commercial relations with the local economy. For instance, the Lebanese IP law of 1924 was drafted under the French protectorate in line with the French statutes and precedents. A significant example is the Bahraini regulation of 1955 that borrowed much from India's pre-independence equivalent statute and was generally dependent upon the United Kingdom Patents Act of 1949. It required prior registration of a patent with the United Kingdom Patent and Trademarks Office as a precondition of eligibility for local registration and granted local protection only for the duration of the period of protection in the United Kingdom.

The post-independence laws were basically meant to take into consideration the domestic needs and local applications. Bahrain amended the 1955 law in 1977 after independence to remove any reference to United Kingdom dependency. Kuwait, meanwhile, issued its original patent law, which also applied to industrial designs and models, in 1962 right after the independence. However, external factors kept influencing the legislators, although such influences were becoming more regional in nature. For instance, the Kuwaiti constitution, civil and commercial laws were drawn up largely under the guidance and influence of the eminent Egyptian jurist Abd Al Razzaq Al Sanhouri. Since these laws were already in Arabic many of them became models for the equivalent laws enacted by other Gulf States, however with some inconsistencies resulting from adapting the model for local needs and use. Also, the Lebanese laws were influenced by the Egyptian literature, doctrine and precedents

which in turn were based on French legal principles. This dialogical interaction was partly influenced by the regional Arab bodies such as the League of Arab States (LAS) (1945) and later the Gulf Cooperation Council (GCC) (1981).

More recent IP legislations were generated between the 1950s and the late 1970s. Developed countries with commercial interests in the Arab region endeavoured to influence the Arab States to conform to international standards of protection and compliance with relevant international instruments for protection standards was becoming a necessity. Many of the Arab States moved towards membership of the international trade community.¹⁰ They were therefore pushed to address the required standards and obligations relating to IP protection. Arab States are more likely to favour IPRs protection commitments, because the public pressure concerning consumption and satisfaction is weak due to less economic growth. The international legal framework for IPRs was essentially structured by treaties which were administered and negotiated later under the auspices of the WIPO. The main treaties are the Paris Convention of 1883, the Berne Convention of 1886, the Rome Convention of 1961 and the Washington Treaty of 1989.

New laws were introduced, enhancements were made to existing laws in the Arab countries and the legal arsenal became increasingly codified during the period. Lebanon has had its industrial property law in force since 1924,¹¹ the State Palestine since 1938,¹² and Egypt and Libya introduced their patent, industrial design and model laws in 1949 and in 1959 respectively.¹³ In 1962, Kuwait introduced the patent and industrial design law along with its civil, commercial and penal laws that also gave some IPRs protection and established some regional benchmark in respect of protection

standards. Iraq followed in 1970¹⁴ and the Sudan in 1971.¹⁵ In the Gulf, Kuwait and Bahrain introduced and upgraded trademark (TM) protection laws in the mid-1970s, and Qatar had set plans in to introduce its own TM law. As for Oman and the United Arab Emirates, they do not have any specific IP legislation.

At international level the first Arab State to join the Paris Convention was Tunisia,¹⁶ followed by Morocco,¹⁷ Lebanon and the Syrian Arab

Republic.¹⁸ Egypt joined the Paris Convention in 1951, Mauritania in 1965, Algeria in 1966, Jordan in 1972, Iraq and Libya in 1976. Although, all Arab States became members of the Paris Convention, only four countries signed the Madrid Agreement concerning the International Registration of Marks of 1891: Morocco (30 July 1917), Egypt (1 July 1952), Algeria (5 July 1972) and the Sudan (16 May 1984). Arab States were effectively engaging in the then existing international IP system.

Box 1. International conventions

Paris Convention

The Paris Convention established important general principles concerning the international protection of industrial property whose object is widely defined to include patents, utility models, industrial designs, trademarks, service marks, trade names, indication of source, appellations of origins and the repression of unfair competition. The Stockholm Revision Conference in 1967 focused mostly on reorganizing the administration of the Paris Convention.

The provisions on national treatment and the right of priority are the most important principles enshrined in this convention. National treatment means that nationals of any signatory country to the Paris Convention (known as the Paris Union) should enjoy the same protection and remedies against infringement as nationals of any other signatory country to the Paris Union. The same treatment is granted to nationals of other countries who live or have a real and effective establishment in one of the Paris Union countries. The right of priority allows an applicant who has made a first application in a Paris Union country to file later applications in other Paris Union countries during the period of priority, which is twelve months for patents starting from the date of the initial application. This instrument also urges countries to establish an industrial property service and a public register where details of granted patents and trademarks are regularly registered. Although the Paris Convention and other international conventions went a long way in providing a workable international regime for IPRs, they offer insufficient protection against the harmful effects of trade distortion. This is due to the absence of mechanisms for enforcement and dispute settlement. Filling this gap was one of the reasons behind conceiving the TRIPS Agreement.

Berne Convention

As for the Berne Convention for the Protection of Literary and Artistic Works of 1886, it protects copyright and neighbouring rights. It is based on three basic principles and includes a series of stipulations on the minimum protection and special stipulations for developing countries. The three basic principles are the principle of national treatment, under which works from one contracting State must have the same protection given to works of nationals of another contracting State; the principle of automatic protection, meaning that protection must not be conditional upon compliance with any formality; and the principle of independence of protection, meaning that protection is independent of the existence of protection in the country of origin of the work.

The Swiss Government created the Bureaux Internationaux Réunis pour la Protection de la Propriété Intellectuelle (BIRPI) to oversee the administration of the Paris Union and the Berne Union.

Sources: Deere, 2008; WIPO, n.d.a, n.d.b.

Morocco was the first to join WIPO in 1971, with twelve additional Arab States joining during the 1970s¹⁹ and three States during the 1980s.²⁰ Consequently, these States benefitted from the WIPO legal and technical assistance in the field of drafting of and training on IP laws.²¹ In July and November 1975, WIPO prepared two decrees for Algerian authorities: one on the protection of inventions and another on the remuneration of inventors. Also, in November 1975 the WIPO furnished Saudi Arabian authorities with information on the “Model Laws for Developing Countries” which focus on patents and trademarks. In 1975, the Industrial Development Centre for Arab States (IDCAS), with the assistance of WIPO, continued its efforts to prepare a draft plan on the establishment of a

regional patent documentation centre and included patent documentation training for an IDCAS staff member to enhance drafting activities. In the same year IDCAS and WIPO also collaborated to finalize the formulation a Model Law for Arab States on Trademarks.

In 1972 and 1975, LAS, with the assistance of WIPO, sponsored the development of two model laws addressing patent protection and trademarks, trade names, commercial indications and unfair competition respectively (box 2). WIPO also drafted many model laws for the protection of IPRs conceived for developing countries in the field of copyright in 1967,²² and in the field of industrial property in 1967,²³ 1979²⁴ and 1980.²⁵

Box 2. IP model laws by WIPO

First Model Law

In January 1972 a Committee of Arab Experts met, under the patronage of the Industrial Development Centre for Arab States (IDCAS), at WIPO headquarters. The Committee studied the “First Draft of the Model Law for Arab States on Inventions” and focused on difficulties related to:

- Protecting small inventions;
- The licenses of right; and
- Synchronising the Model Law with the Patent Cooperation Treaty (PCT).

Second Model Law

In June 1975 IDCAS and WIPO in collaboration with the Government of Tunisia, invited a Committee of Experts to examine the second draft of the Model Law for Arab States on Trademarks in Tunis. Present at the meeting were representatives from Algeria, Egypt, Iraq, Kuwait, Libya, Morocco, the Sudan, the Syrian Arab Republic, Tunisia, Qatar and the United Arab Emirates.

Discussions focused on the second draft of the Model Law and included preliminary observations from States and written observations made during the meeting. A revised draft was prepared in October 1975 and submitted to a drafting committee. The committee met in November 1975 in Doha, Qatar, to finalize the revised draft and adopt the final text of the model law.

Sources: WIPO, 1972, p. 3; WIPO, 1976, p. 5.

Although they were freshly drafted, only few countries took advantage of them to introduce or update their legal statutes.²⁶ In 1979 a model law on patents was published and mainly used in the 1980s and 1990s as a tool for legislative advice. It served as a model for national laws in countries with no laws in place or who wanted revise existing laws. The final update of the model law was published in 1979, but it is no longer provided to developing countries, unless requested, because it does not reflect recent developments in international patent law.²⁷

Developed countries, mainly the United States of America, did not support the work developing new model laws or revising the existing model patent law. Their point of view was that it would be more efficient for WIPO to offer request-based legislative and policy-related technical assistance tailored to individual member States.²⁸

In September 1992, the GCC Unified Patent Regulation as well as the establishment of the GCC Patent Office, in Riyadh, Saudi Arabia was approved by the GCC Supreme Council. Subsequently, Oman enacted a decree in 1993 to formally recognize the regulations and to legitimize the arrangement.²⁹ Although Kuwait and Qatar claimed to ascribe to the regulations as their national patent law, they took no further action. The regulations established a scheme for regional protection throughout all member States that allows for the registration of a single application with the regional patent office located in Riyadh.

These regulations were either somewhat weak in the length and scope of protection or in the enforcement process.³⁰ The actual protection was granted for 15 years, although commencing

from date of the grant not the date of application, instead of 20 years as stipulated later in the TRIPS Agreement;³¹ pharmaceutical and chemical inventions were excluded from any form of protection; the concurrent applications to national patent offices and to the GCC Patent Office were prohibited; and the regulations contained no effective enforcement provisions, or sanctions, remedies or relief.

B. Legal framework after the TRIPS Agreement

In the mid-1990s most Arab countries implemented trade liberalization processes, at multilateral, bilateral and regional levels.³² The IPRs protection system set by the TRIPS Agreement benefits the WTO members, which is not the case for all Arab countries. TRIPS' first function is to govern relations between trading partners, organizing and managing relations on IP matters and keeping differences within reasonable bounds. The TRIPS provisions specify enforcement procedures, remedies and dispute resolution procedures. Following Article 7, the goals are the protection and enforcement of IPRs to effectively promote technological innovation and technology transfer and dissemination to the shared advantage of technological knowledge creators and users. Furthermore, protection should benefit social and economic welfare, and balance rights and obligations. TRIPS' second function is to adopt broader policy goals for IP protection.

Arab States countries viewed accession to the WTO as a vital step towards solving their financial troubles through attracting more foreign direct investment (FDI), obtaining

access to other major regional and international markets through trade liberalization and tariffs reduction, in addition to gaining recognition of their financial and economic credibility. Except for the State of Palestine, some Arab States joined the WTO, while others became observers.³³ Nine Arab States which were contracting parties to the General Agreement on Tariffs and Trade (GATT)³⁴ were founding members of the WTO.³⁵ Four Arab States joined the WTO consecutively³⁶ and were required to undergo a full scrutiny of their IP protection regimes as part of their WTO accession processes. One of the reasons behind TRIPS is to supplement and develop some consistency with the existing major international texts on IP at the time. The TRIPS preamble enunciates the general goals which include decreasing distortions and obstacles to international trade, the encouragement of good and acceptable IPR protection and making sure that enforcement mechanisms do not themselves become obstacles to lawful trade. It provided additional obligations and switched to a higher level of protection. TRIPS is still the most comprehensive multilateral agreement on IPRs, encompassing most types of rights except for breeders' rights, utility models and traditional knowledge. Its provisions are compulsory for all WTO members, even the ones that have not ratified the Berne, Paris and Rome Conventions and the Washington Treaty.

Although TRIPS enhanced the abovementioned conventions, many observers are of the opinion that its impact is mainly redistributing economic gains from the poor to the rich countries.³⁷ The agreement obtained from developing countries to include IPR within WTO have afforded them some trade advantages such as increased market access

for textiles and apparel and the liberalization of agriculture.³⁸

By virtue of their WTO membership, the 13 Arab States had to adopt TRIPS. Significant changes to the IP systems were therefore a consequence of this agreement provisions. Almost all the WTO Arab member States had to enact patent laws or to amend the existing ones, and to introduce or modernize the apparatus for the registration and enforcement of IPRs (box 3).³⁹

In this regard, all developing countries joining the WTO were granted a five-year grace period by TRIPS Article 65.2 to implement its provisions. They were also granted additional five years by virtue of Article 65.4 to implement its provisions on areas of technology not previously easily protected. In contrast, developed countries were compelled by Art.65.1 to implement its stipulations within one year of the Agreement coming into force, meaning by 31 December 1995.

Box 3. IP and Yemen's accession to WTO

Yemen's journey to membership in the WTO took 14 years of difficult negotiations until finally accepted in 2014. Consequently, the Yemeni IP regime faced major changes to comply with TRIPS requirements. These changes included:

- The creation of the IP Office as a public administration authority at the Ministry of Industry and Commerce in 2003;
- The accession to the Paris Convention in 2000; and
- The enactment of a new comprehensive law for Patents, Utility Models, Layout Designs of Integrated Circuits and Undisclosed Information in 2011.

Source: Compiled by ESCWA.

Several developing countries found that the implementation deadline was too short for their compliance. This was complicated by the general review agendas of the Agreement. These agendas required countries to go through a review process before even obtaining the necessary knowledge and experience on the operation of the agreement. Some Arab States felt that these were unreasonable pressures exerted by developed countries to impose TRIPS Agreement compliance. They contrasted the pressure imposed on them with the failure of developed countries to offer inducements for technology transfer and the lack of provisions for technical assistance to developing countries, as stipulated by Art. 66.2 and Art. 67 respectively.⁴⁰

At most, the Arab region there has neither seen the generation of local patent of any competitive dimension nor the opportunity for a thriving patent infringement industry as in the case of copyright (table 1).⁴¹ As one commentator said, “the relatively few patents which have originated from within the [GCC] States in recent times have mostly come from the energy industries in Saudi Arabia and the United Arab Emirates. They have mostly been lodged by expatriate residents rather than nationals, been owned by a foreign company and have included a claim for priority based on an earlier foreign patent application.”⁴² The concern of some Arab countries for a strong patent protection regime has not been particularly steady, probably because the environment to foster local invention and technology transfer has never really been strongly established.⁴³

Some initiatives for an improved economic integration derived in parallel with the TRIPS from the Arab countries themselves. It occurred before, during and after the establishment of the WTO. For instance, the

increase in free trade agreements between Arab countries: Egypt concluded agreements first with Libya and the Syrian Arab Republic in 1990, then with Tunisia, Lebanon and Jordan in 1998, and with Iraq in 2001; the Agadir Agreement was signed in 2004 by Morocco, Egypt, Jordan and Tunisia, creating a free trade zone between the Arab Mediterranean countries. Many initiatives, however, remain attempts that did not enter into force. Early attempts include the Arab Economic Unity Agreement of 1957, the 1964 Arab Common Market, the Agreement to Facilitate and Develop Trade among Arab States (1981), the Gulf Cooperation Council (1981), the Arab Cooperation Council (1989) the Arab Maghreb Union (1989) and the Greater Arab Free Trade Area (1998) which is the most recent attempt for economic integration, and the measured abolition of obstacles to internal trade.⁴⁴

The most far-reaching agreement at the regional level, covering today eighteen Arab countries, is the Greater Arab Free Trade Area (GAFTA).⁴⁵ Declared within the Social and Economic Council of the Arab League as an executive programme to activate the Trade Facilitation and Development Agreement, GAFTA was signed in 1997. It provides for the trade liberalization and for an inter-Arab consultation concerning services, research and technological cooperation as well as IP. Readers interested in the status of Arab countries in international treaties may refer to table A.3 in the annex. Additionally, table A.4 in the annex shows membership of Arab countries in LAS, GCC and GATT.

To reinforce the economic cooperation with Arab States, some initiatives originated from outside the Arab region in the form of bilateral agreements. Bilateral trade and investment agreements advocates argue that they bring

economic growth, reduce poverty and increase living standards and employment opportunities. Some developing economies are however alarmed by the power imbalance between parties to a bilateral agreement. The overreliance of weaker countries on stronger ones, the bargaining power of stronger parties and the disadvantage of developing countries due to lack of expertise in trade negotiation, are major concerns.

Pushed mainly by the European Union and the United States, the motto of these agreements is that trade liberalization and investment are the engines for growth. However, bilateral agreements have been criticized because bilateralism allows the developed countries to use coercion strategies and socialization that cannot be successfully employ at the multilateral level.⁴⁶ These bilateral agreements include IP clauses with a scope going most of the time beyond the TRIPS requirements. The TRIPS Agreement sets minimum IP standards, while bilateral agreements raise them; therefore, they are largely considered as a back door “TRIPS-Plus” imposing stronger IPRs rules.⁴⁷

Today’s international business atmosphere insinuates an IP paradigm dominated by the EU and the US. In order to gain access to their markets and maybe to avoid losing access to them, Arab countries are willing to sign bilateral

agreements containing TRIPS-Plus provisions on IPRs (table 1).⁴⁸

The main objective of IPRs protection is the promotion of industrial creativity and innovation to the advantage of a country’s socioeconomic development. Arab countries can expect from the international community very few concessions on this regard.⁴⁹ Recognition and development of IPRs under the specific public interest of each Arab country becomes a must. Although some discrepancies exist between various national IP laws, multilateral instruments would bridge the gap, with the public interest principle kept in mind when negotiating free trade agreements (FTAs).⁵⁰

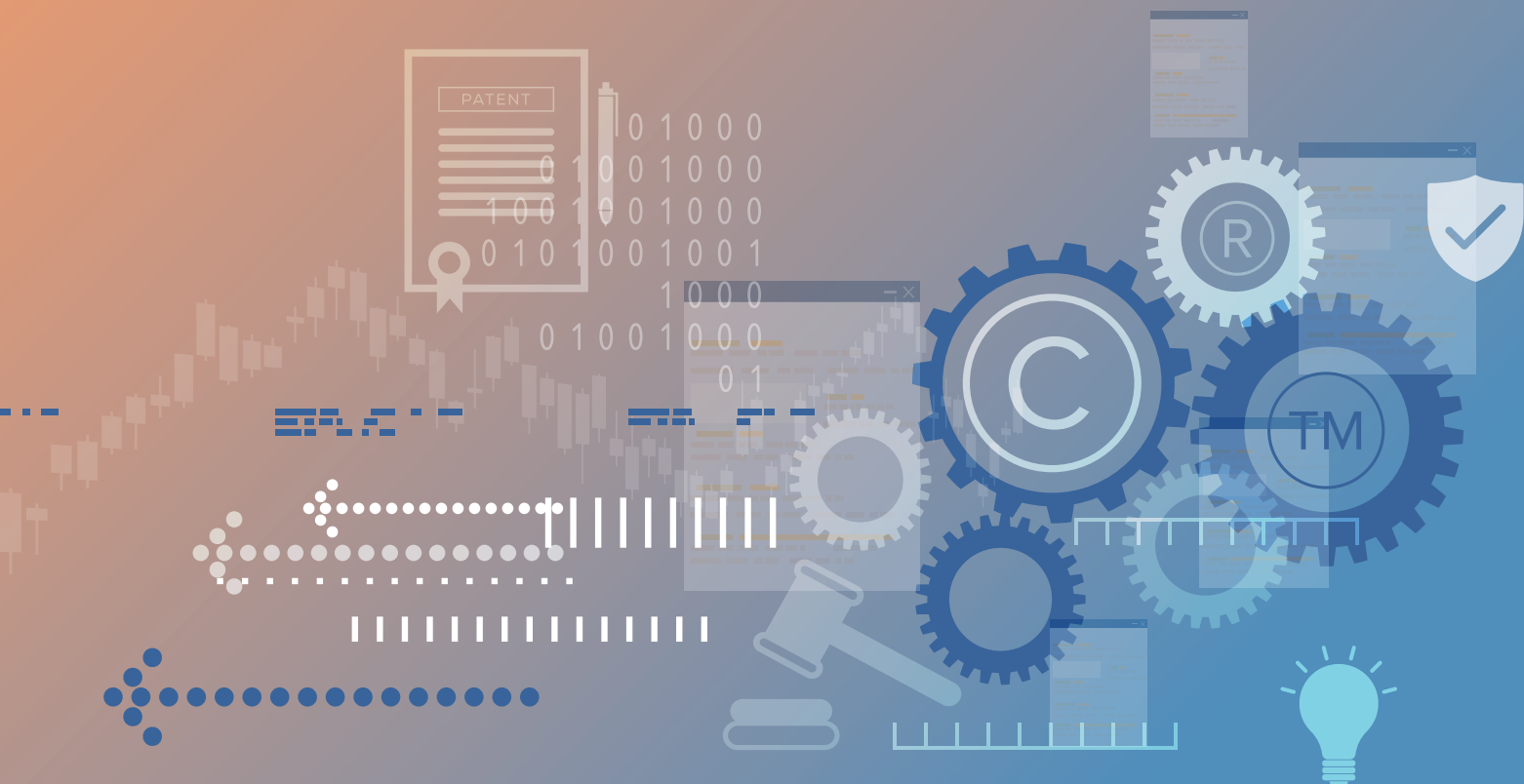
Some commentators stated the following: “[W]hat alternative do these States have? Bilateralism is like cooking an elephant and rabbit stew: however you mix the ingredients it ends up tasting like elephant”, adding that “[m]ultilateralism is the only prospect for constraining the elephant by rules under which it agrees to submit to binding arbitration.”⁵¹ Certainly, effective implementation of strong IP systems in the Arab region would result in a stronger position to better negotiate bilateral and multilateral instruments. Nonetheless, it is not enough to simply write laws in compliance with the TRIPS and FTA provisions and expect the beneficial interest to accrue without making sure the system works in practice.

Table 1. Agreements with European Union and the United States

Country	EU	US	GAFTA
Jordan	EMAA 2002	FTA 2001	YES
United Arab Emirates		TIFA	YES
Bahrain		FTA 2006	YES
Tunisia	EMAA 1998/DCFTA (In negotiations)	TIFA	YES
Algeria	EMAA 2005	TIFA	YES
Comoros	PCA 2019		
Syrian Arab Republic	CA 1978/EMAA 2008 (Negotiations initiated)		YES
Djibouti			
The Sudan			YES
Somalia			
Iraq	PCA 2018	TIFA	YES
Oman		FTA 2009	YES
State of Palestine	Interim EMAA 1997		YES
Qatar		TIFA	YES
Kuwait		TIFA	YES
Lebanon	EMAA 2006		YES
Libya	FA 2008 (initiated)		YES
Egypt	EMAA 2004	TIFA	YES
Morocco	EMAA 2000/DCFTA (In negotiations)	FTA 2004	YES
Saudi Arabia		FTA 2005	YES
Mauritania			
Yemen	CA 1998	TIFA	YES
GCC	CA 1988/FTA (Negotiations suspended 2008)		

Source: European Commission, available at <http://ec.europa.eu/trade/policy/countries-and-regions/negotiations-and-agreements/> and United States International Trade Administration, available at <https://www.trade.gov/fta/>.

Notes: Cooperation Agreement: (CA), Deep and Comprehensive Free Trade Agreement (DCFTA), Euro-Mediterranean Agreement establishing an Association (EMAA), European Neighbourhood Policy (ENP), Framework Agreement (FA), Partnership and Cooperation Agreement/Agreement on Partnership and Cooperation (PCA), Trade and Investment Framework Agreements (TIFA).



2. Innovation Environment and IPR in the Arab Region



2. INNOVATION Environment and IPR in the Arab region

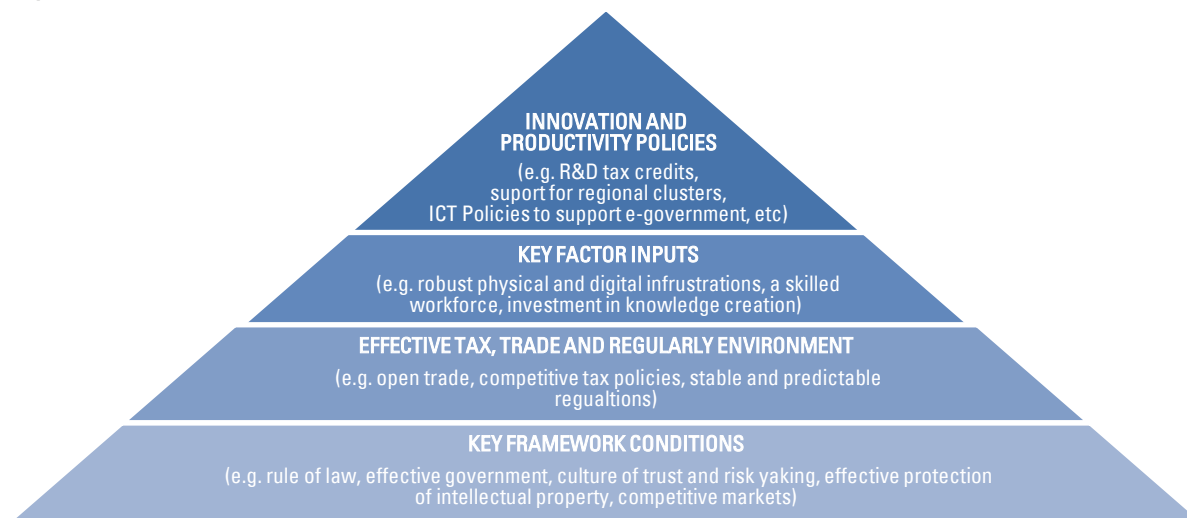
A. IPRs and the SDGs

1. Relationship between innovation, inventions, technology and IP

The meaning of development is still a topic of discourse among social scientists and international development experts and organizations.⁵² The SDGs are a set of 17 goals and 169 related targets for achieving a sustainable development.⁵³ It is noteworthy that several agreements influencing the sustainable development contain provisions on technology transfer, which is undeniably an IP-related issue.⁵⁴

IPRs existence and enforcement are necessary during the whole process of technology transfer. The cycle of innovation begins with an invention ready for commercialization or deployment for society's benefit and development. The commercialization of an invention in the innovation cycle is possible at any phase, regardless whether it is a result of applied research, a prototype or a product. It is dependent on various factors such as the nature of the technology and market needs. Nonetheless, from the generation of a novel idea until it enters the marketplace, IPRs are a *sine qua non* key factor accompanying the innovation process through all its stages (see figure 1).⁵⁵

Figure 1. The Economic Growth Policy Pyramid



Source: Ezell, Atkinson and Wein, 2013, p. 58.

Although IP is territorial and innovation is global, IP systems are an important contribution to the creative and innovative sectors of a country's economy by encouraging investment in R&D. In industrialized countries, IPRs are part of the infrastructure supporting investments in R&D leading to innovation. IPRs protection could positively affect economic growth in developing countries by attracting foreign technology embodied in capital goods.⁵⁶ Technology transfer, innovation and its dissemination, create an intrinsic link between IP and development, and reflect the IP objective as stated in the TRIPS' Article 7:

Objectives: The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.

IPRs constitute an important component of legal system of the ESCWA framework of innovation policy for Arab countries.⁵⁷

"Without innovation, there is no way we can overcome the challenges of our time. What is important, [...] is to make sure that innovation works for all and not only for few."

Secretary-General António Guterres, World Intellectual Property Day, 26 April 2017.

Initiatives that include the private sector, government and NGOs thrive in the promotion of innovation and entrepreneurship in the Arab region, which in turn leverages innovation to create value.⁵⁸ Policymakers and stakeholders are operating a paradigm shift in the innovation ecosystem. Many accelerators and incubators are in fact selecting promising individuals and start-ups and providing them support in exchange for an equity stake. Usually, this support includes investment, access to a business network, co-working spaces, workshops and legal coaching on IP matters.⁵⁹ The number of these institutions is rising significantly especially in Egypt, Jordan, Lebanon and the United Arab Emirates.⁶⁰ In 2015, Queen Rania of Jordan spoke about a "start-up spring" that followed the "Arab spring", referring to entrepreneurship as a key tool to fight unemployment and providing opportunities to the young generation.⁶¹ Although such initiatives are important players in the innovation field by nurturing entrepreneurship, they do not necessarily focus on producing and protecting intangible assets by the IPRs.

While innovation involves a complicated effort including discovery, development, preservation and commercialization of new processes and products, an invention does not have to be directly associated with the process of commercialization.⁶² Invention involves early stages of innovation; that is, the discovery and generation of new ideas and securing them through the IPRs, namely patents, trademarks, industrial design and copyright. Innovation, however, focuses on the commercialization and involves two or more stages following the invention. Entrepreneurs recognize the potential

early on, and then turn it into something profitable. In fact, commercialization is a crucial step for innovation, without which most inventions “die a lonely death, never seeing the light of commercial success”.⁶³ The number of patents granted in a specific sector or field of a country is a helpful institutional and national indicator on contributions to innovation, but only for that specific sector or field. It also only provides the number of inventions generated and does not indicate the innovative level of a country. Table A.5 in the annex shows the total number of granted patents in selected Arab countries and developed countries.

2. IP for development and the SDGs

The SDGs aim to achieve a set of objectives of economic, social and environmental dimensions. They are therefore closely related to the multifaceted definition of competitiveness.⁶⁴ The level of productivity and development is in fact influenced by a set of institutions, policies, and factors. This level defines in each country the revenues gained through investments in the economy, which are the primary drivers of its growth rates.⁶⁵ Innovation and technology are the instruments for sustainability, growth and competitiveness. Their diffusion, protection and promotion have a critical role in achieving many of the SDGs.

The 2030 Agenda does not directly refer to IP in its SDGs and targets. There is only one exception in the SDG 3, paragraph 3.b. It mentions IPRs regarding flexibilities to protect public health, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health.⁶⁶ Also, there are no indicators related to IP in the current global indicator framework.⁶⁷ Nonetheless, SDG 9 recognizes technology and innovation, for which IP is crucial for their sustainability. The effective use of IP tools such

as patents facilitates the market access and success of an innovation. Also, IP enhances the competitiveness of all and specifically technology-based enterprises, regardless if these enterprises are commercializing new or enhanced products or delivering services using the latest or upgraded technology. Moreover, innovation and creativity – without being goals in themselves – are the tools for creative solutions to development global challenges.

The major contribution of IP to development lies in economic growth where it contributes to the GDP as well as job creation. Sectors that rely on IPR provides 5.4 per cent of jobs in Canada, 6.5 per cent the European Union and 7.3 per cent in Russia.⁶⁸

Companies and investors in developing countries prefer to protect their inventions by patents. Domestic innovators, including small or medium enterprises, view the system as a beneficial for monetizing their inventions, moreover, domestic companies rely on trademarks to protect their brands. This highlights the factors that attract foreign investors, for example investors will prefer working in countries where IPR is available for them to protect their inventions or brands. Brands and investors that rely on IP through trademarks or patents have been shown to be more successful than other that do not have such protection. Increased success of domestic firms increases their contribution to economic development of the country.⁶⁹

United Nations General Assembly resolution 72/242 of 2017 on the “Impact of Rapid Technological Change on the Achievement of the SDGs”, stressed “the vital role that science, technology and innovation, including environmentally sound technologies, can play in development and in facilitating efforts to

address global challenges, such as efforts to eradicate poverty, achieve food security and nutrition, improve agriculture, enhance access to energy and increase energy efficiency, fight diseases, improve education, protect the environment, accelerate the pace of economic diversification and transformation, improve productivity and competitiveness and ultimately support sustainable development”.

Science, technology and innovation (STI) bring about economic growth as it increases productivity, reduces costs and boosts efficiency. The 2030 Agenda identified STI as a vital means of SDG implementation, and accordingly the Organization launched the UN Technology Facilitation Mechanism (TFM). Every year member States and STI stakeholders discuss topics of shared interest in the context of the 2030 Agenda during the Multi-stakeholder Forum for Science, Technology and Innovation (STI Forum) as the main forum for TFM.⁷⁰

STI has a direct impact on SDG 2 (zero hunger), SDG 3 (good health and well-being), SDG 4 (quality education and access to knowledge), SDG 6 (clean water and sanitation), SDG 7 (affordable and clean energy), SDG 8 (decent work and economic growth), SDG 11 (sustainable cities and communities) and SDG 13 (climate change). Also, innovation can assist in achieving SDG 1 (no poverty), SDG 8 (decent work and economic growth), SDG 14 (life below water) and SDG 15 (life on land). Moreover, certain SDGs are relevant to the settings of an innovation policy framework, notably SDG 5 (gender equality), SDG 8 (decent work and economic growth), SDG 10 (reduced

inequalities) and SDG 12 (responsible consumption and production).

The achievement of such other SDGs is dependent upon the development and dissemination of innovative technologies through technology transfer, among other things. However, the existing technology transfer models have been found to be inadequate to meet the needs of developing countries. Even though there is international consensus on the value of technology for development, the technological divide is growing between countries internationally and regionally, as well as within countries, by the technological marginalization of the poor.⁷¹ Most technology transfer takes place as North-North trade because of barriers to technology transfer in developing countries. Among those, the lack of knowledge on technologies available without license fees, where many of them have not been implemented for sustainable development purposes in developing countries so far.

Developing countries are moving to strengthen their STI capabilities with the aim of reaching the status of emerging economies. Many countries have yet to integrate STI policies with the SDGs. Nonetheless, there are challenges such as the capacity to absorb technologies, the poor financial capacities of the governments and private firms and the management of IPRs regimes. Also, a required first step is to perform technology needs assessments to avoid rebound effects and adapt technologies to local contexts. Only then can STI be vital to reduce the costs of transition towards environmentally sustainable societies and economies.

Box 4. IP, food security and agriculture

Food security is increasingly important in all societies with nearly 1 billion people suffering from chronic hunger with an expected 70 per cent rise in the demand for food by 2050. Continuous agrarian productivity will therefore be critical component in attaining global food security, according to a report published in May 2018 by STA Law firm.

Agricultural research is essential to develop agrarian productivity and global food security. IP is present in this field through patents or plant breeders' rights, that for example seek to develop seeds with higher quality or specific characteristics to improve food security and agro-biodiversity management. IPRs in agriculture are not only for developed countries but for developing countries as well, whether in the private or public sector. The legal security that results through IPR increases the percentage of investors in this field. In the agriculture sector IP is divided into two forms: first, plant breeders' right and second, patents for technological advances in genetic engineering.

The patenting of food products evolved in the GCC, specifically Kuwait, Saudi Arabia and the United Arab Emirates. For example:

- In the United Arab Emirates provides every consumer a right to safety and freedom in food for consumption through a law approved by the president in 2016. It provides a focus on commercial food protection through IP;
- In Saudi Arabia a royal decree was issued regarding food products and created a penalty for violating patents in food industry;
- In Kuwait a law was issued in 1962 that regulates patents. Its application is similar to that of the United Arab Emirates in that all inventions that violate public morals are subject to penalty.

The presence of advanced technologies gave these rights an evaluative role in achieving security for investors in the agrarian sphere.

Sources: STA Law Firm, 2018.

3. IP and academic and public research

Intellectual property is of high interest for public institutes as well as it is for businesses. Today, many public research and non-profit entities seriously consider the positive impact IP on its sustainability of research and development, reputation and for spurring new start-ups.⁷² Although public institutes and non-profit entities are motivated by the public dissemination of research and knowledge rather than profits, they might find solutions for their challenges in securing fund for research or in disseminating the benefits of their finding through innovative

mechanism in IP.⁷³ Still, the challenge remains among public institutions between what kind of knowledge should be completely opened to public and which kind should be under IP law. This depends mainly on the context and the relative added value of the entity. A public entity might choose selected areas to be under IP where it has nationally or internationally added value and leave other areas of research completely open to public.

In fact, public and non-profit entities tend to spread knowledge through various methods since they hold a higher interest in intellectual

property compared to businesses, and their focus lies on this transitional phase that provides open access to all parties and facilitates the flow of information in a certain community. Society is programmed to follow two parallel nonconverging lines: for-profits produce more revenues through the licensing of intellectual property and non-profits increase availability of intellectual property as possible. The ultimate solution is the choice each institute or organization has by finding the added value of IP where they can create short and long-term advantages.

Patenting in academia expanded due to different factors, such as intellectual property strengthening through legislation.⁷⁴ Institutional ownership of IP is not enough to motivate researchers to become inventors, therefore, institutions and individual researchers have incentives to disclose,⁷⁵ protect and exploit their inventions. It is important that those incentives are set at an institutional level and, at the same time, national guidelines can create a good picture of best practices.

For the purpose of building a critical mass in IP management, universities have established Technology Transfer Offices (TTOs) to diminish the differences between invention and commercialization. Governments are helping universities build this IP management since the main obstacle for its development is the access to experienced technology transfer professionals. Furthermore, controversy has been created on whether to license a technology or create a start-up firm to commercialize it.⁷⁶ While governments and university managers favour start-ups, the best method is to study all present factors depending on the technology,

market, skill sets of staff and researchers and the mission of the institution.

The need to maintain public access and balance IP protection concerns many developed countries, some of which are maintaining the traditional missions of universities as well as calculating the costs and benefits of patenting. The dilemma stems from the consequences that may arise as publicly funded research produced by university researchers are protected by university IP, therefore creating further revenue for the university and limits to public access. This has the potential to negatively impact basic research. Nonetheless, studies have shown that patenting has resulted in more applied research being conducted by universities. Studies in the United States also showed that universities and individual researchers that have seen an increase in patenting experienced and great gains in academic publication.⁷⁷ Many academic institutions have formulated their own IP strategy to protect their intellectual property. The below box shows an example of IP policy in the Higher Institute of Applied Science and Technology in the Syrian Arab Republic, which was inspired by other IP policies in the region (see chapter 3). Finally, the work of universities and public research organizations in protecting and exploiting their IP promotes faculty research and building relationships with business clients while protecting the public interest. Intellectual property has multiple channels to transfer knowledge and technology from publicly-funded research. Even though research institutions and firms are trying to create solutions, governments and research funding agencies must be present to fulfil their role in providing guidelines on academic patenting and licensing.

Box 5. The IP policy at the Higher Institute for Applied Sciences and Technology in the Syrian Arab Republic

The institute formulated an IP strategy to obtain their property rights and protect publications, texts, documents and computer presentations produced by its researchers. The purpose of this policy is to encourage and promote inventions and all activities related to intellectual property and support their continuation as well as to establish standards that address future IP-related issues, to motivate and reward members of institute. It also set criteria for determining the rights and obligations of IP development and basic guidelines for technology transfer policy management.

The institute notes the importance of having an organizational structure to apply this strategy through:

- An intellectual property office responsible for implementation of this policy as well as management, marketing and resolving related disputes;
- A Technology Transfer Advisory Committee in charge of reviewing contracts with intellectual property subjects, providing recommendations concerning patented inventions, reviewing contracts that include intellectual property concerning private sector to assure the absence of any conflict with technology transfer policy.

In addition, the institute focuses on procedures. It states that it does not recommend any advertising or marketing before starting the registration process, since revealing an invention before applying for registration can result in loss of the patent right.

Sources: Syrian Arab Republic, Higher Institute for Applied Sciences and Technology. Available at <https://hiast.edu.sy/>.

4. Technology transfer and development

The North-South debate on technology transfer emerged after decolonisation as part of the development appeal of newly independent states.⁷⁸ These states believed that socioeconomic advancement moves with technological development. In the 1970s developing countries engaged in a string of initiatives in an effort to narrow the gap between old colonies and their western counterparts.⁷⁹

At the international institutional level, there was an attempt in 1961 to confront the international IP

system for neglecting to meet the development needs of poor countries. The governments of Brazil and Bolivia submitted a co-sponsored draft resolution to a General Assembly committee. The resolution included some concerns such as “access to [...] knowledge and experience in science and technology is often limited by patents and similar arrangements designed to protect the right of ownership and exploitation of investors of new processes, techniques and products”.⁸⁰ The resolution 1713(XVI) titled “The Role of Patents in the Transfer of Technology To Under-Developed Countries” declared that the application of the international patent system should consider the special economic

development requirements of under-developed countries, and the legitimate claims of patentees.

The first United Nations Conference on Trade and Development (UNCTAD) meeting in 1964 recommended in its resolutions that “developed countries should encourage the holders of patented and non-patented technology to facilitate the transfer of licenses, know-how, technical documentation and new technology in general to developing countries, including the financing of the procurement of licenses and related technology on favourable terms”. It adds that “competent international bodies, including United Nations bodies and the Bureau of the International Union for the Protection of Industrial Property, should explore possibilities for adaptation of legislation concerning the transfer of industrial technology to developing countries, including the possibility of concluding appropriate international agreements in this field”.⁸¹

Also, in 1964 the Economic and Social Council of the United Nations adopted a Resolution “that reaffirmed access to knowledge and experience in the field of applied science and technology is essential to accelerate the economic development of underdeveloped countries and to enlarge the overall productivity of their economies” and further that “the most widespread exchange of knowledge and experience in the field of applied science and technology would facilitate the continued development of industrialization and international economic relations.”⁸² UNIDO undertook to find ways and means of facilitating the transfer of technology through its continuous relationship with UNCTAD.

In the early 1980s a grouping of developing countries (the Group of 77) wanted preferential treatment and supplementary measures that

would oblige foreign patent holders to work in countries that granted them patents. Some commentators stated that the failure of the Diplomatic Conference on the Revision of the Paris Convention was partly due to the opposition from developed countries against these measures, and partly due the fact that developing countries could not agree on the measures among themselves.⁸³

The TRIPS Agreement of 1995 sought to encourage creations and inventions through various commercialization mechanisms with the adoption of a uniform policy. This agreement is tilted towards a single, strict and standardized document that equates all countries, irrespective of their economic demands and technological capabilities. The 2030 Agenda seems, however, not to adopt a one-size-fits-all approach in IP protection, as different development stages require different IP protection. Thus, developing economies can enjoy flexibilities in the IP system to promote technological transfer and innovation. More importantly, developing policies that integrate IP is required before reaching a strong IP protection.⁸⁴

Since TRIPS, governments with IP-based multinational corporations have constantly tried to expand IP protection standards beyond existing multilateral channels. FTAs, bilateral treaties, European cooperation and partnership agreements and multilateral efforts like the Anti-Counterfeiting Trade Agreement (ACTA) and the Trans-Pacific Partnership (TPP) negotiations have all included stricter standards for protection and enforcement of IPRs.⁸⁵ For instance, the copyright term was expanded in order to comply with the obligations imposed by the FTA that Oman has signed with the United States. This strategy of “regime shifting” has also been used by developing countries.⁸⁶

In addition to rebalancing the gap between developing and developed countries, the value of technology transfer for development was further recognized at international level. To this end it has been continuously included in multilateral instruments aimed at achieving sustainable development. Some instruments that include elements of technology transfer are as follows: ⁸⁷

- United Nations General Assembly resolution 3202(S-VI), “Programme of Action on the Establishment of a New International Economic Order” (1974);
- United Nations Framework Convention on Climate Change (1992);
- Kyoto Protocol to the United Nations Framework Convention on Climate Change (1992);
- United Nations Conference on Environment and Development: Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of all Types of Forests (1992);
- United Conference on Environment and Development: Rio Declaration on Environment and Development (1992);
- Agenda 21 of the Earth Summit in Rio (1992);
- United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa (1994);
- The Paris Agreement (2016).

However, even with the inclusion of technology transfer as a component in multilateral instruments to help in ensure more equal development, the gap persists between developed and developing countries.

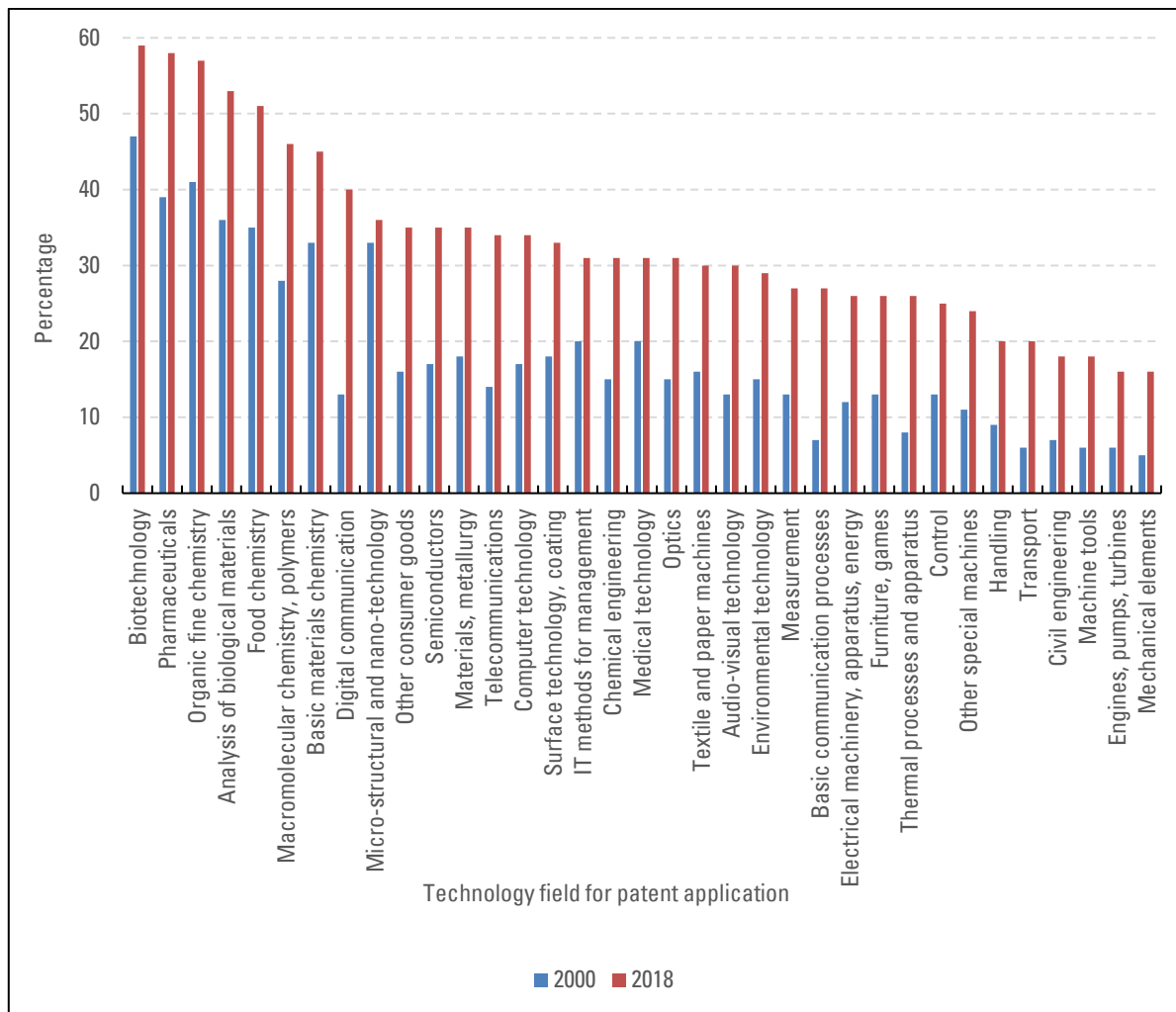
While technology transfer is essential and would help developing countries to move to building their own innovation capacity, it is not enough. The development of innovation capacity should have the highest priority as a requirement to achieve sustainable societies and economies in the long term.

5. IP and women

Worldwide, a gender gap persists in IPR, with women less likely to hold patents than men. This is an important issue to address, as it can negatively impact on economic growth and women's empowerment. It could potentially also influence the success of female entrepreneurs, especially if financial institutions are more likely to provide funding to those that have patents or applications for patents.⁸⁸ Using the current rates at which the share of women in patent applications are increasing, WIPO calculated that gender balance (not parity) in Patent Cooperation Treaty (PCT) applications will only be achieved in 2080.⁸⁹

WIPO statistics on patent applications provide an indication of the situation as it relates to women. The data show that the field where women are most likely to be part of an application for a patent are pharmaceuticals, biotechnology, analysis of biological materials, organic fine chemistry or food chemistry. These areas of technology have been the top five fields for applications by or includes women since 2000, when data in the dataset begin. For the last 18 years the top field for applications that included women has been biotechnology, except for 2010 when it was pharmaceuticals. Figure 2 shows the share of patent applications per technology that includes at least one woman for the years 2000 and 2018.⁹⁰

Figure 2. Share of applications with at least one women inventor, by technology



Source: WIPO statistics database. WIPO, 2019c.

The figure shows that the percentage share of women has increased over the last 18 years in all the fields of technology in which applications were made under the PCT. However, the overall share of applications

listing at least one woman as an inventor has only grown from 20 per cent in 2000 to 33 per cent in 2018. Table 2 shows the countries that had the highest percentage of patent applications that included at least one woman.

Table 2. Countries with the highest share of applications with at least one woman for 2000 and 2018

	2000		2018	
	Origin of application	Per cent share of application is women	Origin of application	Per cent share of application is women
1	India	39	Uruguay	70
2	Republic of Korea	38	Panama	68
3	China	36	Antigua and Barbuda	56
4	Singapore	36	Republic of Korea	51
5	Slovakia	35	Malaysia	50
6	Slovenia	33	China	49
7	Barbados	31	Colombia	42
8	Saudi Arabia	30	Iran	42
9	Hungary	28	Portugal	41
10	Belgium	27	Singapore	38

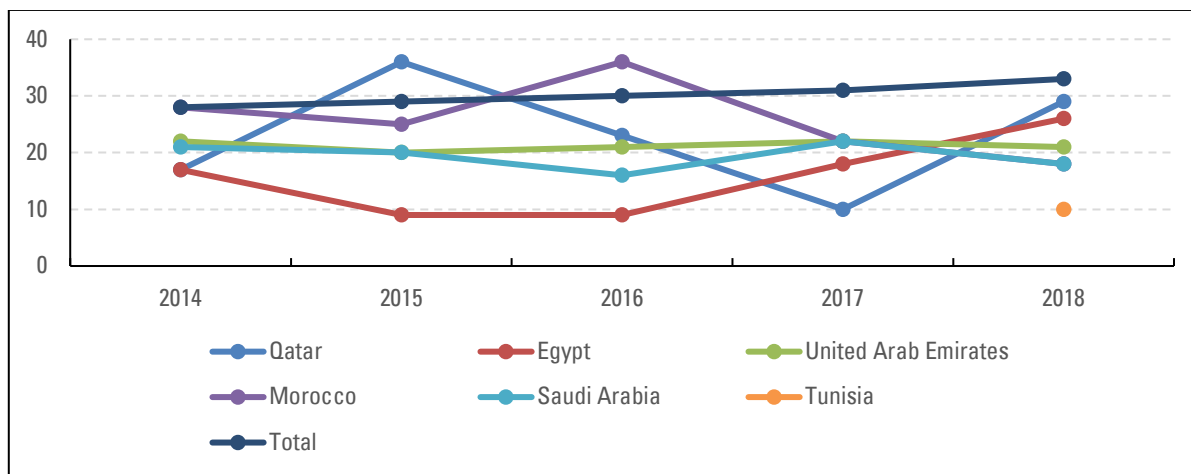
Source: WIPO statistics database. WIPO, 2019c.

Note: These are the top countries for those with available data. Many countries do not have data for this indicator in 2000.

WIPO includes data for six Arab countries namely, Egypt, Morocco, Qatar, Saudi Arabia, Tunisia and the United Arab Emirates. However, between 2000 and 2008 the data for these countries were not constant and data are available only from 2014 for Qatar and 2018 for Tunisia. Over the last 10 years these six countries show increases and decreases in the share of women in applications, however, this can be related to the number of overall applications for a country in given year. It is important to note that the share of applications that lists a woman among its inventors remain below the worldwide total for every year, except in 2015 and 2016 when Qatar and Morocco,

respectively, had percentages above 35 per cent (see figure 3).

The share of women inventors in the total of all listed inventors in PCT applications is also increasing, but again very slowly from 11 per cent in 2000 to 17 per cent in 2018. In 2018 the top five countries were Sri Lanka (43 per cent), Antigua and Barbuda (31 per cent), Panama (30 per cent), Uruguay (30 per cent) and China (29 per cent). In the Arab region Egypt had the highest share of women researchers in 2018 with 22 per cent, followed by Morocco (17 per cent), Qatar and the United Arab Emirates (11 per cent), Saudi Arabia (10 per cent) and Tunisia (7 per cent).⁹¹

Figure 3. Share of applications with at least one women inventor in the Arab region, 2014-2018

Source: WIPO statics database, 2019.

The reasons for the low number of patent applications can be linked to the fact that there are fewer women in certain science, technology, engineering and math (STEM) fields as well as that many, due to a variety of reasons, may not follow a career in these fields in which patents are most common after completing their education.⁹² The reasons for the low applications from women for patents is not only related to the number of women in STEM fields, especially as the number women in these fields have increased and in some countries, including some Arab countries, the number of women is higher than those for men. It is therefore clear that women, even if they are working in fields in which patents are common, are still not participating in the patent system. Some studies have found that social barriers still exist that prevent women from benefitting from patent systems. The findings indicate the women are less likely to seek commercialization of their

inventions and discoveries and are also less likely to market themselves to potential partners which could require patents. They are also potentially excluded from networks that would put them in contact with other innovation partners that can lead to patents. However, data are still too sparse to provide a complete understanding of the barriers and limitations that women experience and prevents them from participating in the patent system.⁹³

6. Weak IP versus strong IP systems

The international economic landscape periodically faces controversies concerning IPRs. The important debate is whether it is advantageous for a developing country to strengthen its own IPRs regime and to make it conform to specific standards already operating in developed countries. Two models are opposed in this renewed debate:⁹⁴ the first

recommends a strong regime of IPRs for economic development and the second argues that weak IPRs protection, or even the absence of IPRs, is a way to allow the rapid diffusion of knowledge and the building up of local capabilities.

Maximalists supporting strong IP regimes argue that improvements in the protection of the IPRs will be beneficial for both developed countries and for developing ones. Companies in the North will find enough incentives in favour of licensing the knowledge and collaborating with companies in the South on common projects. Such investment in R&D will benefit developing countries from greater inflows of technology transfer and foreign investments (box 6).⁹⁵ Strong IP regimes may also prove to be beneficial for the empowerment of women as they would protect the rights of both women

and men. It has been shown that when IP regimes are stronger in protecting the rights of women, their participation in the community and the market increases which could help them to become innovation leaders.⁹⁶ Minimalists, on the contrary, critique IP by claiming that strengthening IPRs protection can lead to increased prices that distort consumer choice and reduce welfare. They argue that a strong IPRs regime can reduce technology transfer by limiting the extent of imitation, which makes it difficult to narrow the North-South technological gap.⁹⁷ When developing countries harmonize their IP standards to match those of developed countries, they incur short-term expenditures such as rent transfers and administration and enforcement outlays that outweigh the preliminary benefits, and could take scarce resources away from other crucial sectors.⁹⁸

Box 6. Pharmaceutical sector in India

The pharmaceutical industry is one of the most important in India and one of the best examples to highlight the impact of intellectual property on economic growth under a strong IP system.

The Indian pharmaceutical market is the third largest worldwide in volume and among the largest in value created across the market. It has a mature market in the Organisation of Economic Cooperation and Development (OECD) countries, making it unique among other pharmaceutical sectors in the world.

After becoming a signatory to the WTO in 1995, India was required to develop a product patent regime. Later, pharmaceutical companies created partnerships with multilateral companies to undertake R&D activities. The validity of patents in India has been recognized through a new patent act and the protection it offers for local development. This has led to the largest number of Federal Drug Administration (FDA) approved manufacturing units outside the United States of America. By 2014 the size of the market was \$34 billion, according to the organization Pharmaceutical Production of India.

Regardless of India's success in making use of national and international IP systems, some issues remain to be resolved, such as the trade-off between making medicine available at a lower price and providing innovative modern medicine, urging innovators to invest in R&D and manufacturing within India to allow for greater local consumption, and that guaranteeing the highest quality of medicines necessitates large investments.

Although the strong IP regime has brought success in the international arena for the country, the impact on benefits within the country is still lagging.

Sources: Mondal and Pingali, 2017.

Global technology systems and international organizations have worked on facilitating STI cooperation so that the diverse needs of development and sustainability can be better met.⁹⁹ The role of governments could encourage the acceleration of technology transfer, by sharing and diffusion through an enabling environment and sustainability-orientated enticements at the local level, which are bolstered by sufficient IPR protection. Relevant scientific and technical resources need to be mobilized, and behaviours and institutions profoundly transformed altogether, to ensure such sustainable development. No doubt, precautions must be taken, as in the words of some commentators, “historical evidence strongly suggests that by depriving developing countries of the freedom to design IP systems as they see fit, the rich countries are [...] ‘kicking away the ladder’ after they have scaled it themselves”.¹⁰⁰

B. IPRs and innovation ecosystem in the Arab region

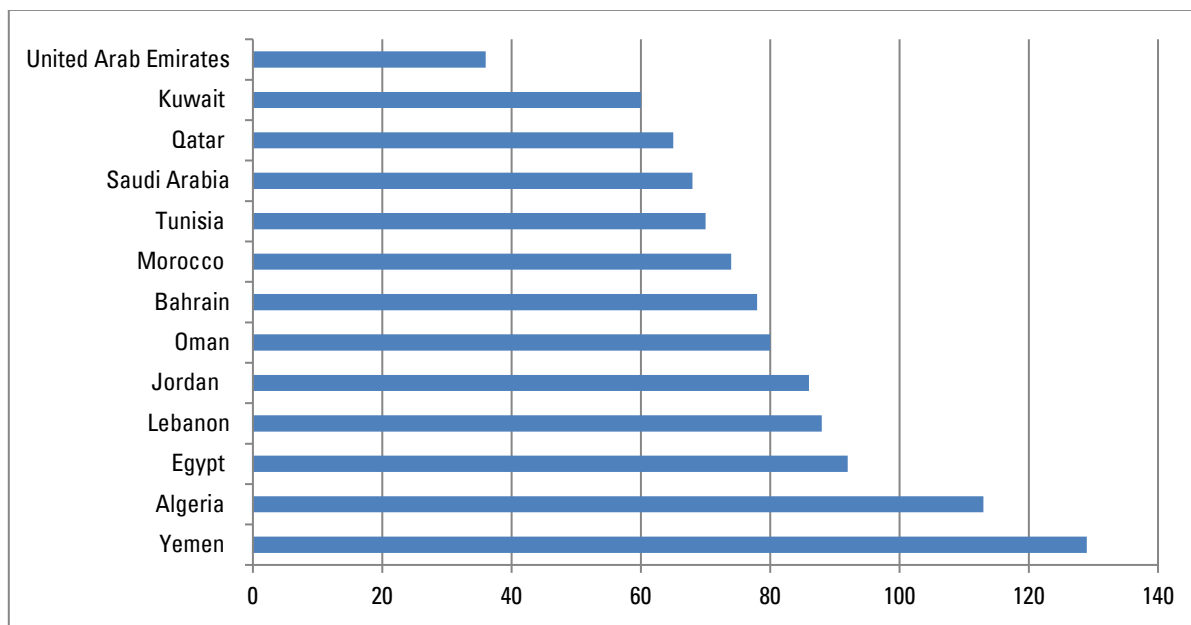
Innovation leads to higher efficiency, productivity and sustainability thus increasing the economic outcome. The revenues generated therefore nurture R&D, which leads to more technological innovation,¹⁰¹ and so on. The Global Innovation Index (GII) 2019 identifies factors that promote innovation and uses 80 indicators to rank 129 countries accordingly. IP and knowledge policies are main factors that indicate innovation capability of a country.¹⁰² The United Arab Emirates ranked 36 out of 129, leading the Arab countries in the innovation

process, while Yemen is last, ranking 129th (figure 4).¹⁰³

The Global Competitiveness Index 2018 (figure 5) illustrates that the Arab countries have improved their average performance, in part because of the trend of low oil and gas prices. The microeconomic environment of the region has been negatively impacted by the fall in oil prices during the past decade, which is forcing many countries to implement reforms to increase diversification. It is mainly the macroeconomic performance of GCC economies that have been affected by this downturn, while other countries increased fiscal space due to the reduction of energy subsidies.¹⁰⁴ Large investments in digital and technological infrastructure is encouraging and have brought about essential upgrades to technological readiness. However, these investments and upgrades have not led to a revolution in the innovation levels of the region.

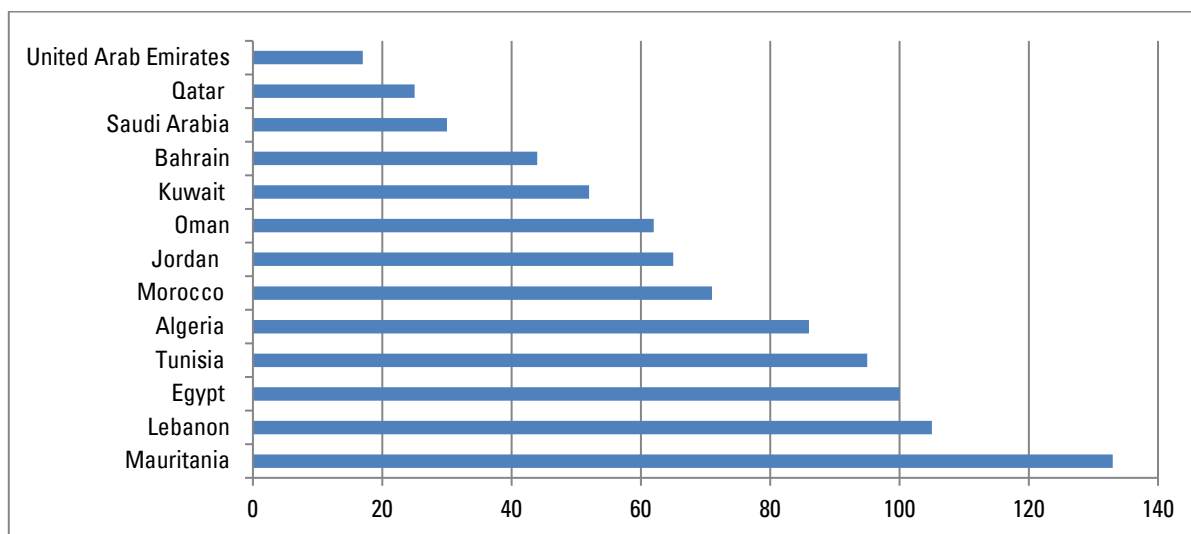
The current state of the Arab innovation ecosystem shows a growing number of digital innovative start-ups mainly in fintech and e-commerce. Digital solutions offered in these two fields account for 23 per cent of all deals in the Middle East and North Africa (MENA) region.¹⁰⁵ E-commerce has been one of the most actively invested industries in the Arab region innovation ecosystem since 2012.¹⁰⁶ But much of the value of firms in the digital economy is in their intangible assets, which are capitalized through IPRs protection. The world’s most valuable brands are those of technology companies which own portfolios of mainly patents, trademarks, industrial designs and copyrights.¹⁰⁷

Figure 4. Arab States ranking in the GII 2019 (total 129)



Source: Global Innovation Index, available at <https://www.globalinnovationindex.org/Home>.

Figure 5. Arab States ranking in the GCI 2018 (total 137)



Source: World Economic Forum (WEF), Global Competitiveness Index, 2018, Middle East and North Africa, available at <http://reports.weforum.org/global-competitiveness-index-2017-2018/middle-east-and-north-africa/#view/fn-10>.

Although patents provide the best scope of protection when the invention meets the legal criteria, securing them is usually burdensome for individuals, start-ups and sometimes even for small and medium size enterprises (SMEs). Moreover, digital creations and inventions such as mobile apps, web apps, platforms, software, databases, etc., are not necessarily protected by the patent system. Only a few jurisdictions around the world offer this protection, such as the American law that stipulates “anything under the sun that is made by man” is considered patentable subject matter and excludes the laws of nature, natural phenomena and abstract ideas.¹⁰⁸ Usually it is possible to obtain a patent for an inventive process that includes software for operation, provided that the patent does not relate solely to the software. The patent is not granted on the isolated software, but on the combination between process and software.

Laws in Arab countries, and most European legislation, expressly exclude computer programmes per se and business methodologies per se from the patentability because inventions under the different patent laws should have a technical character.¹⁰⁹ Examples of a technical character include approaches used to control an industrial process, data processing related to physical entities (such as temperature, size and shape) and the inner workings of the computer. However, a computer programme that focuses on solutions for financial system operations can only have a technical character if it is based on technical considerations linked to the inner workings of a computer (for example, improvement of security).¹¹⁰ Therefore, protection through copyright is the alternative measure mainly in this field where creative innovations are not always patentable.¹¹¹

C. Copyright contribution to innovation

Although it is more common to think of the patent system as a source of innovation, economic and technological development, copyright laws play a crucial part in the economy. The role of information has changed in the twenty-first century and has become easier to access. As the volume of information has grown, so has demands for its availability for decision-making. Copyright has been the focus of public debate on access to information. Its importance in daily life and in business operations has also attracted interest from creative economy stakeholders with activities based on digital technologies.

Copyright affects cultural industries such as art, music, literature and film. It also affects educational and scientific research through its impact on the diffusion of knowledge circulated within the copyrighted media, printed and online publications. But it is most important for the database and software industries which are directly and closely connected to copyright protection, without which they have no commercial value. All these industries constitute an important part of GDP and are a source of employment and income. The copyright system can thus have an important influence on intangible capital accumulation through its impact on innovation and creativity, the key determinants of economic development.

Copyright is often confused with “author’s right” or *droit d’auteur*, as it is known in French. While there are similarities between these two legal systems, fundamental differences persist. Copyright is the right of literary and artistic property applicable in Anglo-Saxon or common

law countries. Whereas author's right refers to the civil law countries' concept of literary and artistic property, mainly European countries, copyright is mainly applied in common law countries such as the United States, the United Kingdom, Canada and Australia. Most European countries follow the continental civil law copyright system, except Cyprus, Ireland and Malta.

From an etymological point of view, copyright in France seems to be the right of the author, that is to say having as sole concern to protect the creator and his work. In the United States, copyright is originally a "copy right", attaching the right to the copy, not to the creator. The copyright only protects works fixed in a material medium, whether published or not, such as drawings, videos, computer programmes, etc. Author's right protects all creations of the mind, whether they are fixed on a material medium.

The essential difference between copyright and author's right is that the copyright primarily follows an economic logic: it consists of the right of exploitation. It protects those who invest in IP such as producers, investors and employers, more than the creators of the work. Conversely, author's right primarily protects the creator. The main consequence of this fundamental difference is that the moral right is far less important in countries applying copyright. Author's right, on the other hand, insists on the strong link that exists between the author and his work.

In the civil law jurisdictions, there is an inalienable, imprescriptible and perpetual link between the author and his creation, insofar as the work is considered consubstantial with its author. This is called the moral right of the author on his work. It is inalienable: the author cannot assign it and this right cannot be object to any contract whatsoever.

Usually it is vested to the others only by the effect of a will or by inheritance. In copyright jurisdictions, an author may on the contrary assign his moral right. If he does so, the assignee of this right freely determines the use he wishes to make of the work.

Copyright law defines, recognizes and protects only original works, for a limited period, and it serves in setting the general rules for their trade. It becomes a prerequisite for market transactions by enabling the trade in the creations of the mind; the latter would not be profitable without copyright giving them the characteristics of economic goods. Copyright law has always, since its origin with the development of the printing press until now with accessibility of creative works through digitization and the Internet, adapted to technological changes, although not without challenges. Therefore, copyright is not just a legal category, but also a tool that can aid creators in gaining economic advantages, and thus creates opportunities for employment, wealth and trade.

1. Copyright, employment and the GDP

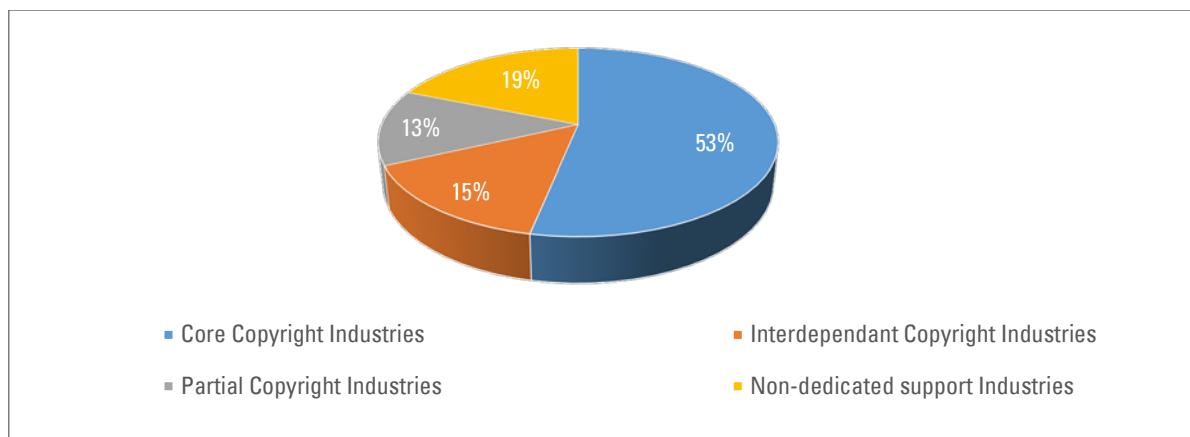
In 2015, WIPO edited a guide outlining a methodology that member States can use to ascertain the economic contribution of copyright-based industries to the GDP, employment creation and trade.¹¹² These standardized guidelines provide a formal definition of copyright industries, and they have served to measure the value of production of these industries, among other aspects.¹¹³ Industries that use protection provided by copyright and related rights are frequently called copyright-based or creative industries. These industries are responsible for direct and indirect contributions to economic well-being and development. Their role in achieving national socioeconomic goals are also growing

in importance. The studies developed using reliable data and common methodologies and resulting from WIPO assistance establish a basis for comparison of future surveys. They present a practical instrument in the form of guidelines, recommendations and survey methods applied in the surveys on the economic contribution of creative industries to the GDP.

Only two Arab countries, namely Jordan (figure 7) and Lebanon (figure 6), have benefitted from

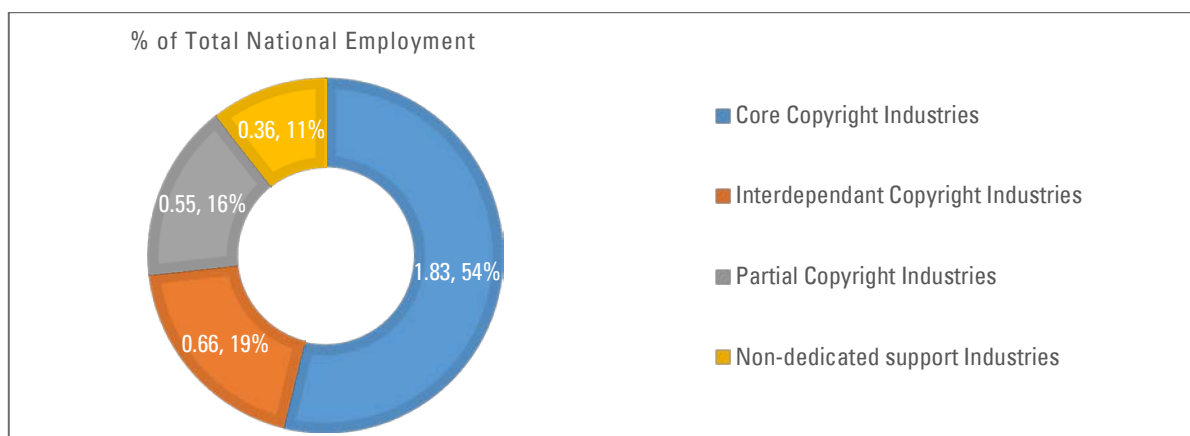
these types of specific studies summarizing existing experience through surveying creative industries which operate on the basis of copyright and related rights protection.¹¹⁴ Although such studies are not recent, there have been no updates or new studies regarding this subject matter for these countries by WIPO to date. It is to be noted that these studies measure the share of copyright and related industries in the GDP, but do not show how the latter is a function of copyright activities (figures 8 and 9).

Figure 6. Composition of the copyright sectors contribution to GDP in Lebanon (2008)



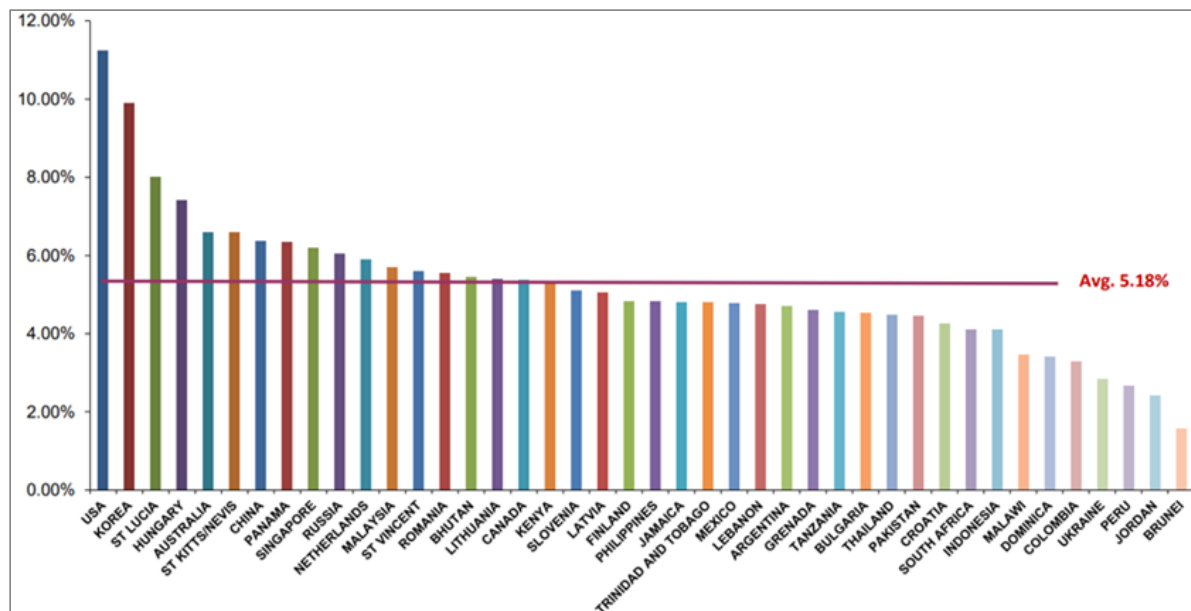
Source: Melki, 2007.

Figure 7. Composition of the copyright sectors contribution to employment in Jordan (2013)



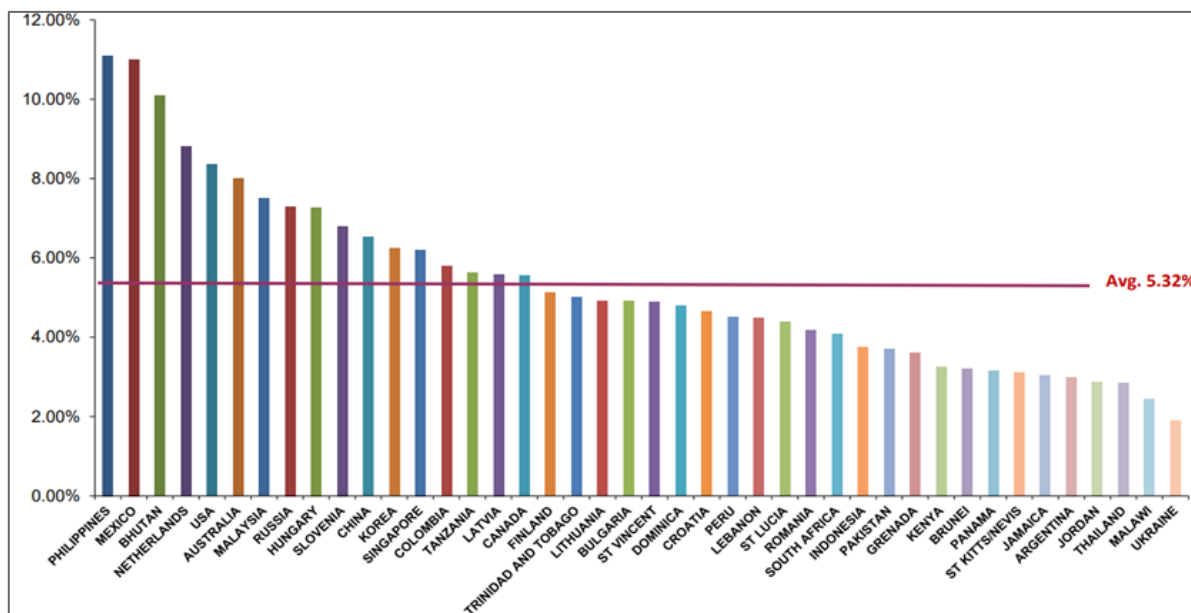
Source: The South-North Center for Dialogue and Development, 2012.

Figure 8. Contribution of copyright industries to GDP - comparative chart (2014)



Source: WIPO, 2014.

Figure 9. Contribution of copyright industries to national employment - comparative chart (2014)



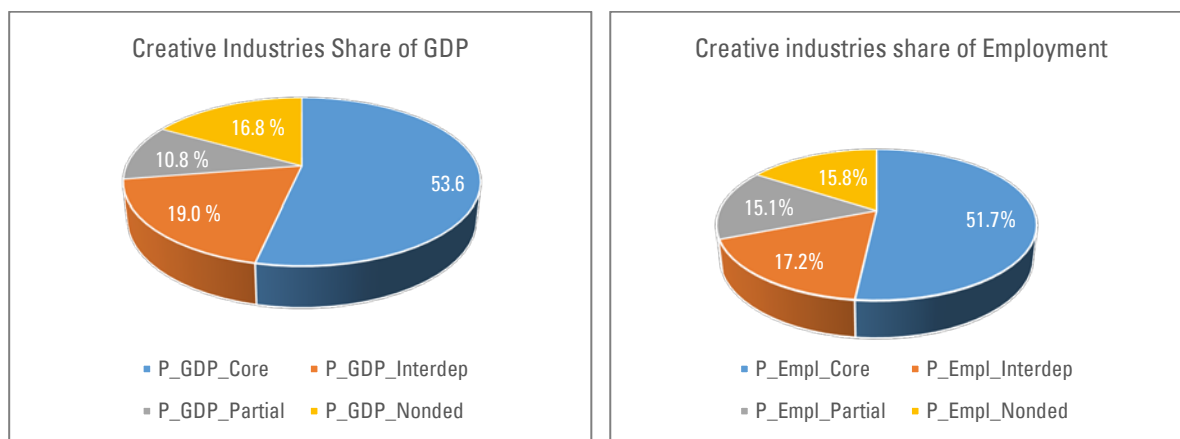
Source: WIPO, 2014.

The WIPO methodology distinguishes between four different groups of copyright industries in terms of function of the dependence level on copyright material – core, interdependent, partial and non-dedicated support industries.

More than half of the total copyright industries' contribution is in employment (figure 10) and the GDP (figure 11) and comes from the core copyright industries. The pie chart (figures 10

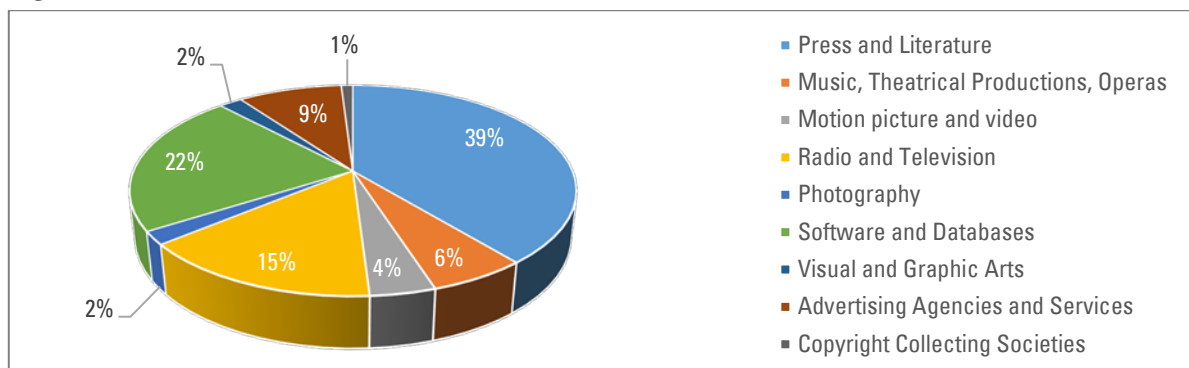
and 11) shows the average breakdown of industries at the core of the creative sector. Press and literature industries are by far the biggest contributor generating 39 per cent of the added value followed by software and database industries with 22 per cent. These industries, together with others such as radio and TV, music and theatre, advertising, motion pictures and video cover over 50 per cent of the share.

Figure 10. Contribution of copyright industries to the GDP and employment by groups of industries



Source: WIPO, 2014.

Figure 11. Contribution of core copyright industries to GDP by industry



Source: WIPO, 2014.

2. Copyright and the new technology innovations

Table 3. Summary of key differences between tangible goods and digital content

Product feature	Tangible goods	Digital content
Marginal cost of reproduction	Positive	Mostly zero
Hardware dependance	Limited	Hardware dependant
Digital delivery	Impossible	Possible
Market scope	Geographically limited	Global

Source: OECD, 2015.

The importance of digital products continues to grow today, as developed economies are shifting their attention from tangible to intangible assets. The main component of the technological revolution is the digitization of content (table 3). The combination of fast-growing high-speed information and communication technology (ICT) infrastructure and a reduction in the cost of data storage have created challenges to the IP laws in general and specifically to copyright.

Digital developments in the software industry affect the business innovation processes and the economy. The new services convey new business styles and other services mixes various more traditional business styles. The Internet has become the new channel for content and service delivery, within borders and worldwide. There are new methods to create income, offline and online, such as ad-based models and subscription-based models. The

trade with “objects” conveying IPRs and copyrighted material is influenced by the legislations that differ from society to another. But copyright evolves under different systems in a nonuniform way and its evolution is conditioned by the globalization phenomena.

However, when we talk about globalization, it implies a flow of information, goods and services, thus a market. Copyright has a place in this homogeneous space, a planet unified by networks. Copyright has an influence on almost everything that circulates in the digital economy. For instance, the switching to digital of delivery models has negatively impacted the music and book publishing industries that had flourished thanks to copyright. Visual arts are another sector where digital downloads have redefined business styles and consequently have also increased the possibility for piracy. Another segment where software source code and almost all elements such as graphics, designs and databases are protected by copyright is the video game industry. The business models of core-copyright industries have also been impacted by the increased transportability of technology. Mobile devices, for example smartphones and tablets, that provide access to streamed or downloadable creative content via the Internet, also increase the possibilities for users to use such content, and to benefit efficiently from different mobile applications.¹¹⁵

The technological revolution reshaped the environment addressed by copyright by impacting the creative content and the copyright-based industries. Many countries have amended their laws to cope with the advancement of technology in adapting copyright to the knowledge economy. In 1996 the WIPO adopted the Copyright Treaty and the Performances and Phonograms Treaty, or the

so-called the Internet Treaties.¹¹⁶ The WIPO Copyright Treaty (WCT) provides protection to authors of literary and artistic works, such as writings and computer programmes, databases, musical works, audio-visual works and works of fine art and photographs. The WIPO Performances and Phonograms Treaty (WPPT), however, protects the rights of authors as performers and producers of phonograms. Several Arab countries are members States of the WCT and WPPT (table 4).

Since the last revisions of the international copyright treaties, elements have developed

such works in new formats, new markets and various new approaches to disseminate and use works. The WCT and the WPPT updated the existing statutes in order to respond to developments in technology. But the two treaties addressed the challenges posed by the Web1.0 and the digital technologies that existed twenty-five years ago. Today's Web3.0 challenges are not the same and the context of knowledge economy and innovation in the marketplace has changed. Many areas of the copyright law are subject to discussions such as the scope of the conferred rights and the limitations and exceptions on copyright.

Table 4. List of Arab countries members to the WCT and the WPPT

Country	WCT	WPPT
Algeria	Accession: October 31, 2013 In Force: January 31, 2014	Accession: October 31, 2013 In Force: January 31, 2014
Bahrain	Accession: September 15, 2005 In Force: December 15, 2005	Accession: September 15, 2005 In Force: December 15, 2005
Jordan	Accession: January 27, 2004 In Force: April 27, 2004	Accession: February 24, 2004 In Force May 24, 2004
Morocco	Accession: April 20, 2011 In Force: July 20, 2011	Accession: April 20, 2011 In Force: July 20, 2011
Oman	Accession: June 20, 2005 In Force: September 20, 2005	Accession: June 20, 2005 In Force: September 20, 2005
Qatar	Accession: July 28, 2005 In Force: October 28, 2005	Accession: July 28, 2005 In Force: October 28, 2005
United Arab Emirates	Accession: April 14, 2004 In Force: July 14, 2004	Accession: March 9, 2005 In Force: June 9, 2005

Source: Compiled by ESCWA.

3. Copyright laws in the Arab region

Most of the Arab countries are members to the Berne Convention for the Protection of Literary and Artistic Works of 1886 governing the international copyright today and ratified by 177 States.¹¹⁷ Almost half of the Arab countries copyright laws that apply today are less than twenty years old. But all the copyright laws of all the Arab countries follow the civil law authors' rights concept, and they are compatible with major protection principles in the Berne Convention. The Berne Convention focuses on protecting the rights of authors and their works. It is grounded in three principles and provides a succession of stipulations on the minimum protection to be given. Special stipulations are also given specifically for developing countries.¹¹⁸

The first principle is that works originating in one of the Contracting States shall have the same protection in all of the Contracting States; this is the "national treatment" principle. The second one is that protection is not conditional upon accomplishment of any formality; this is the "automatic protection". And the third principle is that protection is independent of the existence of protection in the country of origin of the work; this is the principle of "independence of protection".

(a) Copyright scope of protection

Without being less of public interest, the rules of literary and artistic property in its two concepts of copyright and author's right protect the private interests of the author, or the rights owner, by vesting them with specific rights of economic and moral nature.

The economic rights include the right to reproduce the work in any form whatsoever and the right to perform the work publicly. These two prerogatives include the right to make copies of the work, either digitally or physically; the right to sell copies; the right to create and use a derivative format of the work such as a translation; and the right to create a performance based on the work and generate revenue from performances thereof. As for the moral right which is recognized in civil law countries and, to a lesser extent, in some common law jurisdictions, it secures to the author the right of the first divulgation; the right of attribution, including the right to have the work published anonymously or pseudonymously; the right to the integrity of the work; and in some jurisdictions the right of repentance or withdrawal.

Copyright protection extends usually to any original element of expression of the author's creativity but not to the ideas behind it, procedures, methods of operation, or mathematical concepts as such. In the case of technological innovations, software, databases and all digital creations, it should be noted that the object of the protection differs between copyright and patent. Copyright protects the software source code whereas a patent protects the software functionality. An algorithm cannot be granted copyright protection, as it is factual in nature and not an illustration of the author's creativity. Copyright also only protects the source code of computer programme, therefore the form in which it was written. This means that copyright does not protect computer programme functionality, the language in which it was written, or the format it uses for data files exploit certain its functions, as it constitutes an expression of the programme.

(b) Copyright formalities

To enjoy copyright protection, the work must be original reflecting the personality of the author. No registration or other formality is required, which is a basic principle of copyright that provides protection based on the sole fact of the work's creation, meaning that it is protected from the day of creation irrespective of form. The protection is automatic, without the need of any process whatsoever. Registering copyright helps only in proving the date of creation in case of litigation on authorship.

(c) The duration of protection

Copyrighted works are protected in most Arab countries for the lifetime of the author plus 50 years post-mortem. This is the minimum length in time for protection as imposed by the Berne Convention and the TRIPS Agreement. Three

countries, Bahrain, Morocco and Oman (table 5) provide a longer copyright term of 70 years post-mortem. This TRIPS-Plus rule is the result of the FTA those countries have signed with the United States. In Libya, the copyright duration for a work is 25 years post-mortem, as long as the total time frame of protection is not less than 50 years from the date it was first published.

(d) Exceptions and limitations on copyright

The rights granted to the author are not absolute but limited by some exceptions and limitations. A proper balance needs to be preserved between the concerns of rights holders and the users of works under protection. Therefore, copyright laws place some limitations on economic rights, meaning it provides for conditions under which protected works could be used without permission or without paying any fees.¹¹⁹

Table 5. The extension of the copyright term to certain copyright works in Oman

	Copyright Law of 1996	Copyright and Neighbouring Rights Law of 2000	Copyright and Neighbouring Rights Law of 2008
Standard Works	Lifetime of the author plus 50 years post-mortem.	Lifetime of the author plus 50 years post-mortem.	Lifetime of the author plus 70 years post-mortem.
Cinematic Works	25 years from the first publication of the work.	50 years from the first publication of the work.	95 years from the first publication of the work.
Applied Art	25 years from the first publication of the work.	50 years from the first publication of the work.	95 years from the first publication of the work.
Photographs	25 years from the first publication of the work.	50 years from the first publication of the work.	Lifetime of the photographer plus 70 years post mortem.

Source: Al-Balushi, 2018.

There are two doctrines of exclusion where the author or the copyright owner cannot prohibit others from using the copyrighted work. Under the civil law jurisdictions, such exclusions are called exceptions, to which are added limitations in the common law jurisdictions. The regime of the exceptions depends on the philosophical conception of the law to which they derogate. Copyright in civil law countries is a natural right that places the author at the centre of the legal system. The Anglo-Saxon copyright places the public interest at the centre and therefore copyright is limited by exceptions and by the doctrine of Fair Use.

All Arab copyright laws have been influenced by the French copyright whose first statutes were promulgated in 1791 and 1793. Law No. 298 was enacted on 11 March 1957 to cope with new technical and economic conditions. The 1791 and 1793 texts did not comprise any exception to the copyright. It was jurisprudence that established a distinction between private and public use and authorized, in certain cases, the free public use of works of the mind without the authorization of the author. The legislators later integrated other exceptions to the copyright laws.

By contrast, the Fair Use doctrine was developed by the courts and codified in 1976. It constitutes a cornerstone of the American copyright system. The Fair Use doctrine limits copyright and along with the idea/expression contradiction, which is essential to balance the rights of authors and inventors regarding the manage and use of their work with the need for a free flowing ideas and information and business.¹²⁰ It is to be noted that in the United Kingdom and in Canada, there is the Fair Dealing doctrine which is between the open-ended system of limitations represented by the Fair Use, and the exhaustive list of limited cases

represented by the French system of exceptions.¹²¹

Fair Use is flexible and adaptable which is important when dealing with new technologies. It has already been used in the online environment as courts have made some provisions including the ability of Internet search results to use thumbnail images, cached webpages and digital plagiarism detection services.¹²²

As for the exceptions in the Arab region, they are all specific, exhaustive, and rigid. They do not adapt to the evolution of the technology or the society and the judge cannot automatically include new cases under the exceptions on copyright. They are subject to a restrictive interpretation following the Latin adage “*exceptio est strictissimae interpretationis*”.¹²³

D. The impact of IPRs on innovation and some solutions

In the mid-1800s, the British and French had a cultural hegemony over the new world. In France, Louis Blanc pleaded against the “commerce of art”, and Proudhon in his book titled “*Les majorats littéraires*” declared that “property is theft”. He militated against the establishment of a property right of authors on their works. His book was part of a lively debate on the foundation and the stakes of the IP system in general, to which mainly eminent economists and many writers participate.

The debate on IP was also part of a context of development of international trade and counterfeiting. The lack of harmonization between the different legislations allowed publishers to copy the best-selling books in poorly protected countries. Copyright owners

whose interests were harmed have advocated for the adoption of a global protection system. The opportunity to sign an international copyright treaty was deplored by some doctrine, who also denounced the costs of adopting copyright: "What is called free trade looks to the maintenance of the foreign monopoly for supplying us with cloth and iron; and international copyright looks to continuing the monopoly which Britain has so long enjoyed of furnishing us with books".¹²⁴

Such debate is still present today and IP can have both positive and negative influences on creative activity and innovation. But debates about IP policies should focus not on the desirability of strict or lax IP protection, but on the appropriate design of IP systems.

The dilemma for the Arab countries is that if standards of IP protection are too strong, the IP system is not appropriate for their economic development where the costs of protection outweigh the benefits. IP will be harmful to users and potential future creators and inventors more than it benefits current creators and copyright owners. In the other hand, if the standards of protection of IP are weak, industries based on IPRs may not evolve fully.

The role of IP is to stimulate innovation through the protection it confers to the rights owner. Such role is enacted by the law but has also been emphasized by the courts, IP scholars and scholars in other intellectual domains such as in economics. Since R&D is an inherently risky activity and because appropriating its results is limited, it is expected that the free market economy will underinvest in R&D.¹²⁵ Patents, as a tool against imitation and a mechanism for appropriation, can be one of the means by which the State can overcome the problem of underinvesting in research activities.¹²⁶ Patents

represent thus a mechanism that allows reaching a balance between knowledge diffusion and knowledge appropriation. Some other economists argue that without patenting, further innovation will be inhibited since the results of any innovation will remain secret to avoid imitation.¹²⁷

The arguments in favour of IP protection and their role in innovation are opposed by another stream of thought, backed also by some empirical evidence. Some economists show that in dynamic industries, such as the software and computer chip industries in which innovation is both sequential and complementary, patenting could decrease innovation.¹²⁸ Others acknowledge that the enforcement of patent rights will ultimately decrease the amount of appropriable information available to others and the incentive to carry out R&D may thus decrease.¹²⁹ Other scholars contended that the number of patents in each sector of industry does not accurately indicate the impact of patenting on innovation in that sector.¹³⁰

Notwithstanding this debate on the impact IPRs have on innovation, IP laws remain an important legal construct that must take into consideration the balance to strike between the private interests and the public interest. The balance means that IP as stimulating innovation is worthy when the producers of innovation and the economy in general benefit both from the spell over effect of innovation. In 1807, the third American president Thomas Jefferson acknowledged that ideas should move freely between people, and their originators should receive some reward which does not jeopardize the rights of those who wish to improve on them.¹³¹

The solution to this dilemma would be for the Arab countries to keep the IP legislations strong, incentivizing innovation, but to find

intrinsic and extrinsic alternatives, that respect the public interest in accessing the information conveyed within that innovation. Using the rules from inside the IP statutes - intrinsic solutions - could provide the freedom to benefit from a free access to the protected work, be it an invention, a copyrighted work, or an industrial design. Extrinsic solutions could be to limit the scope of the IPRs using rules of statutes other than IP laws.

The intrinsic solutions in the copyright law would consist of reviewing the exceptions and limitations. Copyright grants a monopoly of exploitation to the creator, which goes against the freedom of trade and industry in liberal economies. The public interest is thus sought among the rules enacted to derogate from this monopoly. The exceptions on copyright are crucial and play this role. They enhance and motivate the creation and the information contained in the copyrighted work benefits the public.

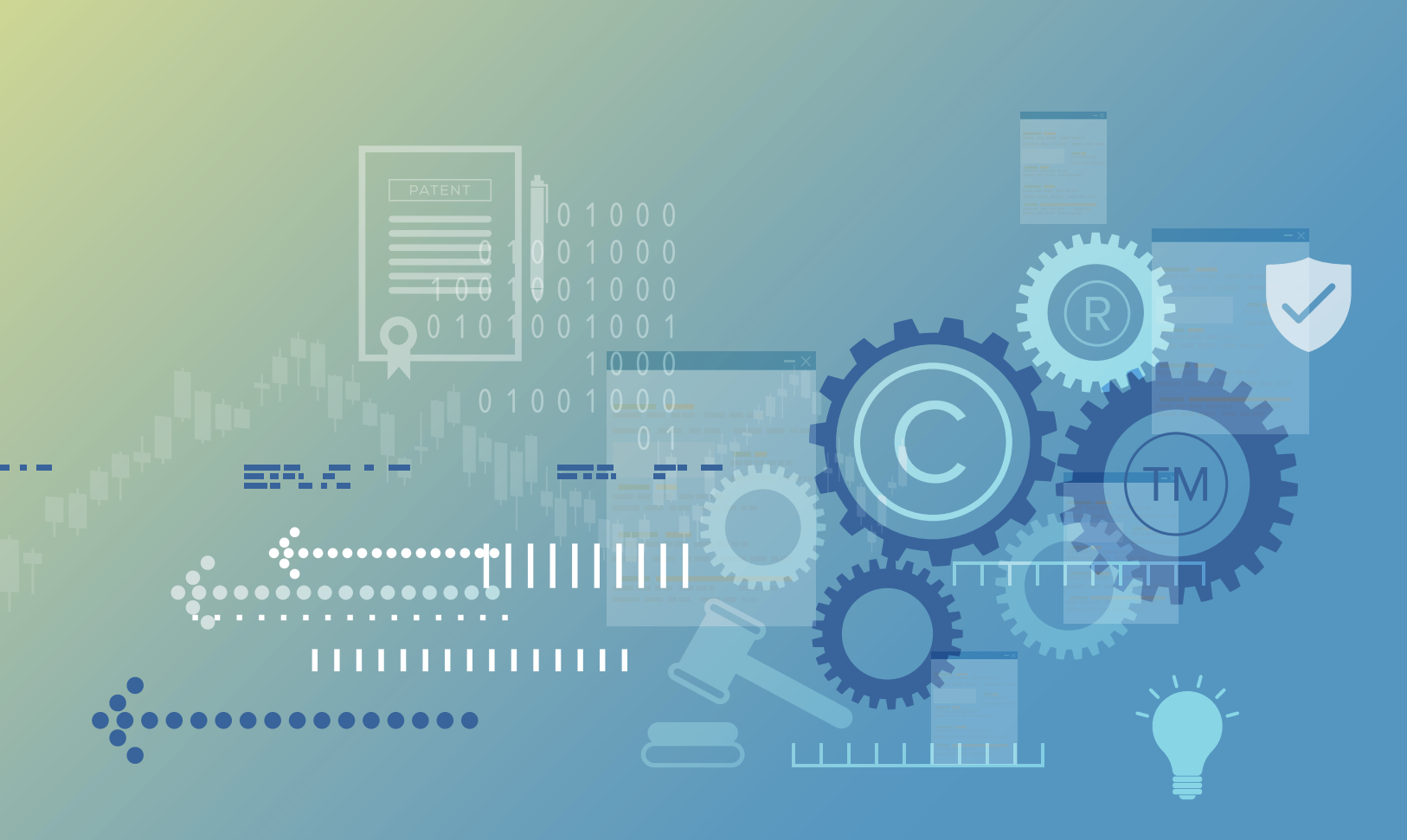
A common intrinsic solution to all IPRs is the term of protection. Depending on each country national interest, the term of protection is either extended or shortened, taking into consideration the international commitments of the country.

The intrinsic solutions in the patent law would be an extension of the compulsory licensing system to meet the needs of the country. Such rules are also enacted in many international conventions for the benefit of developing countries.

As for the extrinsic solution, it would consist in more financial support to R&D and creative industries helping them reaching a critical size so that the public has a stake in the IP assets. Another options would be to take trade liberalization measures, making internal market more competitive, reducing the cost of the IP assets embedded in the technologies, the inventions and the creations. Also, within the trade rules, nationally and internationally, enacting policies that expand exports of copyright-based products and services of developing countries is an option.

Some limitations to IPRs could also be found in antitrust rules, consumer protection laws, access to information regulations and in the theory of misuse of rights. Some other solutions to promote and enhance creative activities would be to enact tax incentives for creative and innovative industries such as software companies and start-ups. Additionally, governments and the private sector must enhance the competitiveness of micro-, small- and medium-sized enterprises (MSMEs) by allocating funds dedicated specifically to perform competitive intelligence.

Arab countries should renew the reflection around a solid but non-hegemonic IP system, which takes the different concerns of all parties into account, respecting their national public interest and their international commitments.



3. IPRs in the Arab Region



3. IPRs in the Arab region

A. IP management in selected Arab countries

Granted patents and other IPRs for processes, services and products are usually registered under the applicable national law by the appropriate national or regional office. Whatever the contribution of MSMEs and start-ups in the economies of the Arab countries, the administration of the IPRs on inventions and original creations should be the same as a process, whether it results from a research centre, an individual or a start-up. Not all Arab countries have an IP strategy that maximizes the benefits and directs them toward specific policy goals at the national and international level; yet most of them have initiatives in the field of innovation. Data from selected Arab countries illustrate how IP systems are managed within administrations, research organizations, universities, MSMEs and start-ups.

1. IPR in Egypt

Egypt's sustainable development strategy for 2030, known as Egypt Vision 2030, is based on a competitive, balanced and diversified economy, dependent on innovation and knowledge.¹³² The pillar on Knowledge, Innovation and Scientific Research focuses on a creative and innovative society producing science, technology and knowledge. This vision respects the constitution in which IPRs protection and enforcement are enshrined in Article 69.¹³³ This constitutional

reference to IPRs reflects higher levels of awareness and engagement with IP issues and places their protection within a human rights framework. One commentator stated that it "is part of a general trend towards the "constitutionalization" of IP protection within a human rights framework deriving either from the rights of inventors and creators or the right to private property."^{134 135}

(a) Administration

The main source of IP statutes is Law 82 of 2002 which is a comprehensive IP code. It expanded the types of protection,¹³⁶ and strengthened the IP system by mandating a full examination process for patents and industrial designs,¹³⁷ mirroring the TRIPS Agreement provisions, and benefitting from its flexibilities to achieve a balance between the rights of creators and the public interest.¹³⁸ Egypt is also party to many WIPO administered IP-related treaties.¹³⁹ The agreement signed in 2005 between Egypt and the European Union for scientific and technological cooperation enhances IP by protecting non-documentary undisclosed or other confidential information and enhances the principles on the allocation of IPRs resulting from the research outcomes.¹⁴⁰ More support is provided through the progressive integration of Egypt into the European Research Area (ERA). In October 2017 the two parties signed an agreement to enable scientific and technological cooperation. The agreement stated the terms

and conditions for Egypt to participate in the Partnership for Research and Innovation in the Mediterranean Area (PRIMA).¹⁴¹

The Egyptian Patent Office (EGPO) is the only official national register with the authority to register and issue patents.¹⁴² It is endorsed as an International Searching Authority and International Preliminary Examining Authority (ISA/IPEA) under PCT, and is allowed to receive patents applications from anywhere in the world.¹⁴³ The office is a key player in technology transfer, IPRs protection and the creation of an enabling environment for science technology innovation-based business and investment. The EGPO has issued a comprehensive guide detailing the registration conditions and process;¹⁴⁴ it also gives free access to an online search tool for its patents database.

Until 2013, the EGPO lacked the required infrastructure, qualified and sufficient human resources and the specific internal procedures, such as updated databases.¹⁴⁵ Since then, it has been continuously upgrading its system to better serve the clients.¹⁴⁶ Today, EGPO has more than one hundred examiners in various technological fields, fifty of whom are technical and legal examiners holding IP post-graduate degrees. New substantive examiners were recruited and attended structured training programmes. These certified trainers are positioned centrally in the capacity-building process.

The State Council is competent to consider claims related to decisions of the EGPO. The decision of an authorized office to grant or refuse the granting of a patent, trademark or industrial design is seen as an administrative decision. It may therefore be challenged before the Courts of the State Council. In general, judicial courts have the capability to review IP disputes. Among these are the Economic

Courts, established by Law No. 120 of 2008, with the power to decide on criminal and civil disagreements resulting from economic laws, including those involving IPRs.¹⁴⁷

(b) Enforcement

Enforcement of IPRs in Egypt is possible either through provisional/conservatory measures or through civil and/or criminal prosecution. The public prosecution has the intrinsic right to file criminal cases, as well as the right to review IP crime verdicts and initiate appeals should there be mistakes in the application or interpretation of the law. Only the owner of an IP right, as the claimant of a civil right, may begin criminal proceedings via direct prosecution. Seizure of the allegedly infringing goods or products, and the equipment used in their production, is also permitted as a conservatory measure through injunctions. Stronger enforcement is secured by an IP unit at the police department and by teams of civil inspectors. Regarding border measures and preventing the entry of infringing goods, regulations that have been adopted permit the filing of a complaint only where the IP owner can supply specific information regarding a shipment, including its bill of lading number.

(c) Generation and management of IP by universities, MSMEs and start-ups

Universities and research organizations constitute the main scientific research entities, though the most limiting factor for innovation are the few direct links between them and industry. Most of the research centres are affiliated with public universities.

Some universities, such as Cairo University and the American University in Cairo, have an internal IP policy. These policies state that all potentially patentable inventions conceived by

members of the faculty shall be disclosed on a timely basis to the university. Titles to such inventions vest in the university, regardless of the source of funding.¹⁴⁸

Researchers from universities across the country have been essential in increasing the degree of scientific research through patents on inventions in various scientific, industrial, sports, environmental, veterinary and engineering fields. But at times, the weaknesses in a culture of quality, monitoring and evaluation in research institutions undermine the proper follow up and the efficiency of national research policies.¹⁴⁹

Another weakness is that collaboration between academia and industry is rooted in a lack of understanding and trust between the two, hindering their ability to serve each other's needs. Academics have little incentive to engage with industry and may not see the research potential in such collaboration, while industry may regard research as impractical and unreliable and may not see the business potential of research results.¹⁵⁰

The Academy of Scientific Research and Technology (ASRT) – to which the EGPO relates – is the main think tank with respect to STI, hosting the national sectorial councils and national technical committees. It is responsible for raising awareness and promoting scientific culture and thinking, assessing STI indicators, and encouraging the complete cycle of innovation from invention to patenting to commercialization. The ASRT initiated the Egypt Knowledge and Technology Alliances (EG-KTAs) which is an assembly of partners working in

increasing the innovation capacities of an industrial sector by improving existing products and services or developing new ones. EG-KTAs aims to pool and network national competences and capabilities at universities, research organizations, non-governmental organizations (NGOs) and industry to drive innovation and technology transfer for solving pressing national problems.¹⁵¹

There is also the Science and Technology Development Fund (STDF), a peer-review grant-awarding body that serves as a main research funding channel in Egypt, thus complementing and strengthening the ASRT role.

There are more than four hundred research centres in Egypt, including both publicly and privately funded centres.¹⁵² There are 24 major public research centres which are independent centres from universities and in most of the cases affiliated to respective ministry (table 6). There are 64 universities out of which 27 are public universities.

The 2018 Global Competitiveness Index (GCI) ranks Egypt 117th out of 137 countries on university-industry collaboration in R&D, and the GII 2019 ranks Egypt 106th out of 129 countries in university-industry research collaboration.¹⁵³ A low ranking in university-industry collaboration is particularly detrimental to Egypt's R&D prospects given the very minimal R&D conducted in industry. Nonetheless, the GII 2019 survey shows that the "state of cluster development" under "innovation linkages" progressed significantly compared to 2018, making Egypt rank at number 38 for this specific indicator.

Table 6. Research centres and institutions in the government sector

Ministry	Research Center/ Institution
Ministry of Agricultural	Agricultural Research Center (ARC)
	Desert Research Center (DRC)
Ministry of Communication	National Telecommunications Institute (NTI)
Ministry of Education	National Center for Educational Research and Development (NCERD)
Ministry of Electricity and Energy	Atomic Energy Authority (AEA)
	Nuclear Materials Authority (NMA)
Ministry of Health	General Organization for Teaching hospitals and Institutions (GOTHI)
	National Organization for Drug Control & Research (NODCR)
Ministry of Housing	Housing and Building Research Center (HBRC)
Ministry of Investment	Tabbin Institute for Metallurgical Studies (TIMS)
Ministry of Planning	National Planning Institute (NPI)
Ministry of Scientific Research	Central Metallurgical Research and Development Institute
	City of Scientific Research and Technology Application (SRTA-City)
	Egyptian Petroleum Research Institute (EPRI)
	Electronics Research Institute (ERI)
	National Authority for Remote Sensing and Space Science (NARSS)
	National Institute for Oceanographic and Fisheries (NIOF)
	National Institute of Standards (NIS)
	National Research Center (NRC)
	National Research Institute of Astronomy and Geophysics (NRIAG)
	Research Institute of Ophthalmology (RIO)
	Theodor Bilharz Research Institute (TBRI)
Ministry of Social Solidarity	National Center for Social and Criminology Research (NCSR)
Ministry of Water Resources	National Water Research Center (NWRC)

Source: Egyptian Science, Technology and Innovation Observatory, available at <http://www.asrt.sci.eg/images/vol5.pdf>.

(d) The IPRs management process

Although somewhat standardized, the IPRs management process is not the same in all research organizations. Some entities have policies on IP ownership and revenue-sharing and others have activities on raising IP awareness; some entities help in patent drafting; and some entities provide funds for IP protection. The same entity could perform one or many of these tasks.¹⁵⁴

The Agricultural Research Centre (ARC): is home to the Technology Management and Commercialization Office (TMCO) which is the owner of all IP generated within the institution. Should commercialization of any invention be successful, the cost of the IP is taken from the income created. The remaining income is divided between the researcher (25 per cent) and the TMCO (75 per cent). The office staff is trained to do research on topics related to IP including finding arts already submitted and drafting patents. IPRs registration fees are covered by the office including drafting, filing, prosecution, maintenance and renewals.

The Technology and Innovation Centres (TICs): Usually TICs use foreign options to resolve challenges they may encounter in industry and they require ownership of the IP that comes from implemented options. If the IP is owned by a researcher, they require an exclusive license so that the same solutions can be used by all industrial partners without restrictions.¹⁵⁵

The Science & Technology Development Fund (STDF): The STDF is the sole owner of any IP created through projects that they fund. Should commercialization of any outputs be successful,

the inventor receives a share of the income generated. This share can range from 2 per cent to 15 per cent of the total income generated.

The Technology Transfer Office (TTO): The TTO at the American University in Cairo has a clear IP and revenue-sharing policy.¹⁵⁶ The ownership of the sponsored research IPRs is freely determined by agreement with the sponsor. The university has ownership of any IP produced by researchers as part of their tasks. If research is produced using the resourced and support of the university, the resulting IPR is shared between the inventor/researcher and the university. Should commercialization or exploitation of the IPR bring in revenue, the cost of IP protection acquisition and maintenance is first deducted, and the remaining revenue is shared among the university (30 per cent), the inventor's school (20 per cent) and the inventors (50 per cent).

Misr El Kheir (MEK) Foundation: Any IP generated through funded projects are not owned by MEK and it does not cover any IP protection-related costs. The Foundation does however, collect 2.5 per cent of the proceeds generated by any of the projects it funds.

2. IPR in Lebanon

On 20 January 2019 the Arab leaders of Arab States met in Beirut at the fourth Arab Economic and Social Development Summit.¹⁵⁷ The ensuing Beirut Declaration emphasized the need to encourage creativity and innovation in order to achieve the objectives of sustainable development. The Private Sector Forum held on the sidelines of the Summit focused on enhancing the role of innovation and supporting

entrepreneurship and small enterprises to achieve sustainable development and Arab economic integration. It also advised strengthening the role of the private sector, to promote the active role of Arab women in the Arab business community, narrow the gender gap, create more effective mechanisms to increase and develop inter-Arab trade.¹⁵⁸

In its Ministerial Statement of February 2019, the Lebanese Government committed to achieving structural reforms to adequately implement the Capital Investment Program (CIP) of 2018. This programme is supposed to inject funds for developing projects with a view to promoting innovation. The delimitation of the CIP is physical infrastructure sector projects that should make use of funds from external lenders or donors or private investors. The selection of CIP projects is based on compatibility with sector strategies that would assist in bridging gaps and achieving SDGs, particularly promoting sustainable industrialization and innovation.¹⁵⁹

To diversify development resources, the envisaged strategy tends to enhance initiatives in the knowledge economy. The Government committed to move ahead in achieving the SDGs by integrating them into national plans and programmes, adopting a coherent approach to economic, social and environmental concerns. One of the main proposed reforms therefore is to vote new laws on IP. In the Lebanon Economic Vision report of 2019, the knowledge economy was also one of the five focused approached sectors, stressing on IP regulatory framework reform.¹⁶⁰

(a) Administration

IPRs in Lebanon are essentially regulated by three texts:¹⁶¹ the Commercial and Industrial Property Law No. 2385 of 1924;¹⁶² the

Protection of Literary and Artistic property Law No. 75 of 1999;¹⁶³ and the Patent Law No. 240 of 2000.¹⁶⁴ Four draft laws have been pending for vote before the Lebanese Parliament since 2007. No doubt after twelve years these draft laws need a review. The four draft laws are: Draft Law Intended to Amend Some Provisions of Law 75/99; Draft Law on the Protection of Industrial Marks, Trademarks and Service Marks; Draft Law on the Protection of Drawings and Industrial Designs; Draft Law on the Protection of Geographical Indications. Lebanon is member of the Berne Convention, the Paris Convention, the Rome Convention and the WIPO Convention.¹⁶⁵ Although Lebanon is not a WTO member, its IPRs legislation is generally compliant with the TRIPS standards.

The Intellectual Property Protection Office (IPPO) at the Ministry of Economy and Trade was established in 1996.¹⁶⁶ Its basic function is the registration of all types of IPRs, but it also has the power to enforce them *ex officio* and performs training and awareness on IP (table 7). Although its resources are scarce, in the last few years IPPO, in collaboration with WIPO, has made an effort to spread a culture of IP. Initiatives undertaken include guides on several aspects of IP, seminars, conferences and campaigns on IP for entrepreneurs and SMEs. It offers an efficient online search tool in its trademark databases and a trademark e-registration system. The General Directorate for Cultural Affairs at the Ministry of Culture has the role of delivering licenses to collective management societies.¹⁶⁷ The Cybercrimes Combating and IP Protection Bureau at the Ministry of Interior has some powers in receiving complaints regarding IPRs infringement and reporting them to the public prosecutor, with investigation and interrogation powers.

Table 7. Lebanese IPRs statistics 2011-2017

Intellectual Property Right	2011	2012	2013	2014	2015	2016	2017
Patents	305	317	330	316	290	253	233
Industrial designs	108	131	108	95	94	108	110
Copyrights	241	263	218	255	275	270	245
Trademarks	7,128 (Register + renewed)	7,339 (Register + Renewed)	5,051 Register	5,558 Register	5,295 Register	5,318 Register	5,909 Register
			1903 Renewed	1521 Renewed	1426 Renewed	1311 Renewed	1288 Renewed

Source: Government of Lebanon, available at <https://www.economy.gov.lb/media/10299/ipr-reports-english-2017.pdf>.

(b) Enforcement

IPRs enforcement in Lebanon starts with the registration of the rights at the IPPO which has a deposition system for patents, trademarks and industrial designs. The examination and opposition procedures are absent from the IP laws. The judge of urgent affairs is the best recourse in the case of an IPRs infringement in Lebanon to at least limit the potential prejudice through preliminary injunctions. The understanding of IPRs within the Lebanese judiciary has improved somewhat in recent years, but gaps remain in awareness as per the economic repercussions of IPRs violations. The high level of counterfeit products and infringement lawsuits led to a rich set of precedents on IPRs.¹⁶⁸ The number of trademark and copyright infringement cases is higher than patents cases most likely because of the low number of registered patents compared to TMs and copyrighted works (table 7).¹⁶⁹

Universities, R&D organizations and SMEs use often alternative methods such as secrecy or technical complexity to protect their innovations.¹⁷⁰ They use trademarks to differentiate their products, and often apply for patents internationally instead of with the IPPO under the belief that this type of registration offers them a competitive advantage.

(c) Generation and management of IP by universities, MSMEs and start-ups

The National Council for Scientific Research (CNRS): The Council was established in 1962 as a public institution with advisory and executive functions.¹⁷¹ Its major concern is use of the nationally adopted scientific policy as a guideline to promote scientific research and support human capacity development. In 2016 CNRS developed guidelines to help Lebanese research institutions and researchers steer clear of irresponsible practices that can occur in

scientific research.¹⁷² It states that ownership of IPRs resulting from a research project and the potential return of its commercial applications are to be considered as the common property of the contributors and that individual members of the research team have the right to be acknowledged. The guideline is only a general framework and obliges institutions to manage and regulate all aspects related to scientific research by developing and adopting comprehensive institutional policies.

The American University of Beirut (AUB): The university was founded in 1866 and has many research centres in each faculty and a Technology Transfer Unit (TTU) at the Office of Grants and Contracts (OGC).¹⁷³ The purpose of TTU is to prepare, draft and update IP policies and procedures, promote development of technology, and support faculties in transferring technology to industry. The unit also works to improve national economic development by bringing inventions and technologies to the marketplace, and in doing so strengthens the links between the public and private sectors. TTU has an IP policy stating that “all patentable inventions conceived or first reduced to practice by faculty and staff of AUB in the conduct of university research shall belong to the University”;¹⁷⁴ it will also own copyright, trademarks and service marks that are the goods and services created at the University.¹⁷⁵

MSMEs, start-ups and IP: More than 95 per cent of registered firms in Lebanon are MSMEs, and they employ 50 per cent of the working population. They are a key engine of growth although they contribute only 27 per cent of the GDP. The proposed definition of SMEs by the Ministry of Economy and Trade “combines annual turnover and number of employees”. Therefore, a microenterprise has to have an annual turnover of less than LBP 500 million and

employ fewer than 10 people; to be considered a small enterprise, turnover should be less than LBP 5 billion and employ fewer than 50 people; a medium enterprise should have an annual turnover of less than LBP 25 billion and fewer than 100 employees.¹⁷⁶

Since the last decade interest has been growing in supporting the private sector, SMEs and entrepreneurship. The Central Bank issued Circular 331 of 2013 injecting \$400 million into the Lebanese enterprise market. This aimed to benefit technology start-up companies, incubators and accelerators supporting development, and the success and growth of companies whose work relies on the knowledge economy and creative intellectual skills. This circular boosted the digital economy, and between 2013 and 2016, Lebanon attracted growing number of capital investors.¹⁷⁷ Start-up skills are high in Lebanon,¹⁷⁸ and the ecosystem is thriving and putting Lebanon on the international entrepreneurial map.¹⁷⁹

For start-ups working in technology, creating, protecting and managing IPRs deriving from innovation represents the foundation, backbone and often the bulk of the company’s value. Technology start-ups include gaming, e-health, advertising technology (AdTech), streaming as a service (SaaS), media streaming, fintech, financial and e-payment solutions. The number of incubators, accelerators, co-working spaces and makers spaces have increased considerably in Lebanon. There are more than ten incubators/accelerators providing support to start-ups in the technology sector.¹⁸⁰ They usually offer a small amount of seed capital, networking with peer ventures, venture capitalists, angel investors and even corporate executives, mentoring and coaching, plus working space.

Although they contribute indirectly to the generation of IP, not all of them have an IP policy. Nor do they have an IP management office to assist creators and inventors in effectively transforming their creations into merchantable products by securing stout IP protection and a relevant IP portfolio. Some incubators are associated with external partners who manage the technology transfer from research to innovation lab to industry. For instance, the company Berytech has partnered with The Next Society, a European Union-funded public and private innovation project supporting research and economic development hubs in Europe and seven Mediterranean countries: Algeria, Egypt, Jordan, Lebanon, Morocco, State of Palestine and Tunisia.

If the industrial property rights such as TM, patent and industrial design are a major valorisation tool for the tech businesses, copyright provides the simplest and least expensive way for efficient protection, domestically and internationally.

(d) Copyright collective management

Lebanese copyright law defines the rules for the collective management of copyright in Lebanon. As such, it stipulates that copyright and related rights holders can start and join companies and associations that are responsible for the management of rights, the licensing of works, and the collection of royalties. Although the collective management system covers all categories of works that are protected by copyright, it is limited in Lebanon to musical works.¹⁸¹

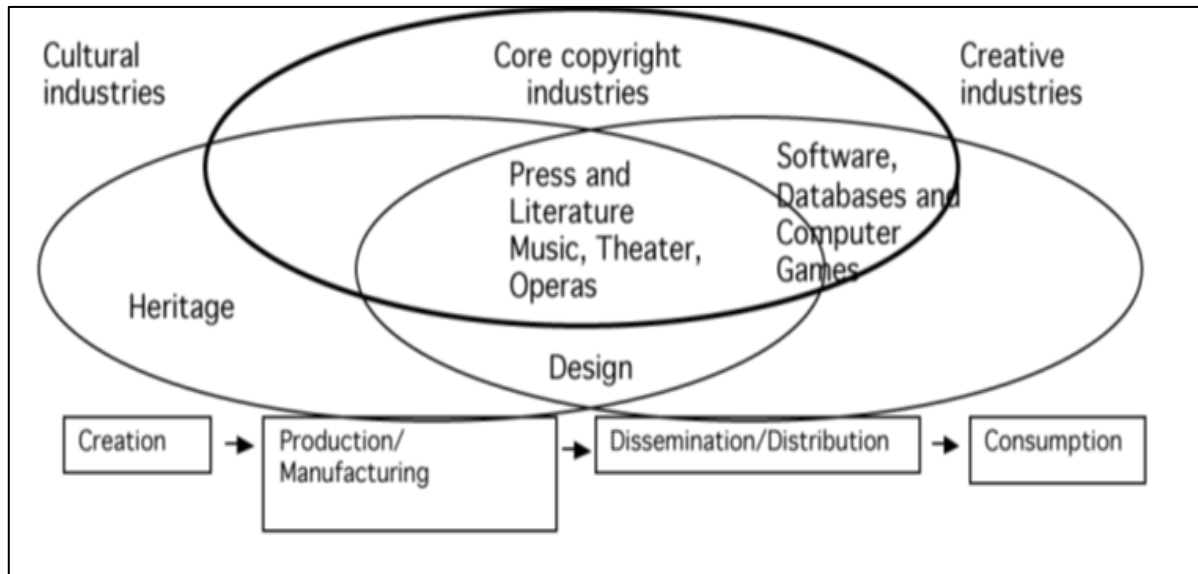
In the musical field, the collective management of performances and broadcasting in the public domain is based on documentation, licensing and distribution. The Collective Management

Organization (CMO) is responsible for negotiations with users or groups of users, for example radio stations, broadcasters, discotheques, cinemas and restaurants. The organization then provides users with the authorization to use works in its repertoire that are under copyright, with payment and adhering to specific conditions. Afterward CMO disperses, using established distribution rules and documentation handed in by users, the collected royalties to its members. A fee covering administrative costs is generally deducted from the copyright royalties.

There is one active collective management society in Lebanon which is the Société des Auteurs, Compositeurs et Editeurs de Musique (SACEM). Operating in Lebanon since 1942, it manages the works and protects the rights of its members in Lebanon and in those countries that have entered into agreement with SACEM. SACEM plays an important role in collecting and redistributing royalties to local and foreign copyright owners.¹⁸²

Copyright-related industries: In its Guide on Surveying the Economic Contribution of Copyright Industries, WIPO categorized copyright-based industries according to the extent of their reliance on copyright into four main groups combining industries with activities (figure 12). These are: core copyright industries, interdependent copyright industries, partial copyright industries and the non-dedicated support industries. Copyright protection of some or many components of each category is somehow omnipresent in the outcome of the technology start-up industry which is becoming a specific national interest to Lebanon. The contribution of copyright-based industries to the GDP was 4.75 per cent in 2007.¹⁸³ As the technology start-up ecosystem has evolved, so has its percentage of the share of GDP.

Figure 12. Mapping of the core copyright, cultural, and creative industries



Source: WIPO, 2015, p. 44.

According to WIPO, “The core copyright industries are industries that are wholly engaged in the creation, production and manufacture, performance, broadcast, communication and exhibition, or distribution and sales of works and other protected subject matter.”¹⁸⁴ These businesses are categorized and include press and literature, music, motion picture, multimedia industries and information technology industries such as software, databases and computer games. Copyright is at the centre of these industries and without it their format would be different, or they would not exist at all. Technology start-ups fall into this category of core copyright industries, and 100 per cent of their value added contributes to the national economy.¹⁸⁵ Therefore, the protection of the new technology products by

copyright is crucial for the tech industry. Taking advantage from copyright by enforcing the rights on the original work since its inception is one important phase in the innovation process.

Some Lebanese courts are at ease in applying the provisions of the copyright law in cases related to online copyright infringement. For instance, in a case initiated by the Lebanese famous singer Wael Kfoury, in an *ex parte* decision the court ordered YouTube and Facebook to take down the infringing content from their websites.¹⁸⁶

In *Paul Guiragossian Foundation vs. Tanit*,¹⁸⁷ the defendant was a Munich-based art gallery with a branch in Beirut. In 2017 the art gallery exhibited online about twenty paintings, owned

by the Tabbal family, of the late famous painter Paul Guiragossian. The defendant did not request a license from the plaintiff, who was the copyright owner of the paintings. The court ordered the defendant to take down the infringing content from the Internet and prohibited them from publicly exhibiting the paintings, although the gallery was the sole owner of the paintings, not the Foundation. This decision defines the scope of the performance right given to the author and has created public and legal discourse over the extent of the protection given to the copyright owner.¹⁸⁸

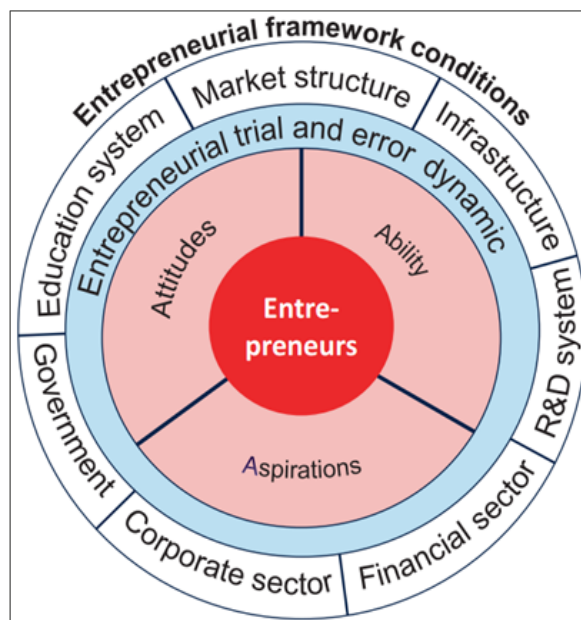
In 2018, an appeals court ordered a renowned broadcasting corporation in Lebanon to pay a \$100,000 fine because they publicly performed music without paying royalties to SACEM, the collective management society.¹⁸⁹

These decisions, among others, illustrate that the copyright law provisions are broad enough to secure an effective and efficient protection to the copyright owner, be it analogue or digital such as the Internet or digital technologies.

3. IPR in Mauritania

Mauritania, one of the poorest of the least developed countries (LDCs) in the Arab region, has a mostly agricultural economy and exports mainly oil and iron ore. The fixed Internet penetration rate in Mauritania is very low, but mobile networks are growing very fast and their expansion rate exceeded 15 per cent in 2017.¹⁹⁰ Thus, there is an opportunity for the founders' start-ups to build e-businesses on the mobile platform. The technology and start-up scene started growing in 2015 due to the work of private initiatives.¹⁹¹ But to thrive, the entrepreneurial ecosystem has many framework conditions that must be met (figure 13).¹⁹²

Figure 13. Entrepreneurial ecosystem configuration



Source: Global Entrepreneurship Development Index 2018, available at https://www.researchgate.net/publication/329212773_The_Entrepreneurial_Ecosystem_and_Global_Prosperty.

(a) The Economic and innovation ecosystem

The economic deceleration in 2015-2016 led the Government to make fiscal adjustment and structural reforms that restored macroeconomic stability. The drop in commodity prices since mid-2014 has slowed growth and exposed Mauritania's vulnerabilities. The non-diversified economy does not create enough jobs in the private sector. As a result, in 2016-2017 the authorities launched a fiscal consolidation plan that stabilized the economy and proposed reforms to improve the effectiveness of the monetary policy. This, along with some business, irrigation and fisheries reforms, led to a moderate recovery.

The economic growth continued its gradual recovery but remains insufficient compared to the rapid population growth. GDP growth has maintained its upward trend since 2015, going from 3 per cent in 2017 to 3.6 per cent in 2018. This moderate acceleration has been associated with a slight increase in inflation from 2.3 per cent in 2017 to 3 per cent in 2018. However, economic growth is below the potential growth rate of 4 per cent and lower than the average of 5.4 per cent recorded in 2010-2014. Moreover, this rate remains limited to 0.8 per cent per capita if one considers the strong demographic growth of 2.8 per cent.¹⁹³

After restoring macroeconomic stability, the challenge facing Mauritania is to overcome the structural obstacles to private sector development. Open market policies to promote investment are not fully institutionalized and tariffs and other restrictions prevent entrepreneurs from participating efficiently in the global economy. The ease of doing business is below potential given its level of GDP per capita. SMEs in Mauritania account for more than 80 per cent of enterprises, but Mauritania's rate of access to financial services is one of the lowest in the world. Mauritania's economic freedom score is 55.7, ranking it 119th in the 2019 Economic Freed Index. Its overall score has increased by 1.7 points, with improved scores for judicial effectiveness, fiscal health and property rights offsetting declines in labour freedom, business freedom and monetary freedom. Mauritania is ranked 18 among 47 countries in the Sub-Saharan Africa region, and its overall score is above the regional average but below the world average.¹⁹⁴ Despite the liberalization of trade, competing with large groups is difficult for SMEs because of their limited access to finance, their lack of reliable financial statements, the lack of qualified personnel, the

high operating costs and the heavy burden of taxes where the personal income tax rate stands at 40 per cent.¹⁹⁵

The Government of Mauritania, with the support of the United Nations, carried out a rapid integrated assessment to inform the country's new Strategy of Accelerated Growth and Shared Prosperity for 2016-2030. The assessment found that 92 SDG targets were included in the existing framework. Although some gaps were found, in general the outcome showed good incorporation of SDGs at that time. This outcome will be used to formulate a new strategy for 2030, transitioning the country away from a 15-year strategy focused on poverty reduction.¹⁹⁶

(b) Administration of IP systems

On 13 September 1962, the Agreement Establishing the African and Malagasy Office of Industrial Property (OAMPI) was signed in Libreville, Gabon, by twelve Heads of State and Government. This agreement was revised in Bangui, Central African Republic, on 2 March 1977, giving birth to the African Intellectual Property Organization (OAPI). On 24 February 1999, the Bangui Agreement was revised with the aim to make its provisions consistent with the requirements of international IP treaties to which the member States were party, including the TRIPS Agreement.

The revision simplified the procedures for issuing IPRs and extended the missions of OAPI which, beyond its traditional mission, must promote the development of member States by means of effective protection of IP and related rights and provide training in IP matters. Also, it extended the protection to new objectives such as plant varieties and the layout designs of integrated circuits. Two Arab countries are OAPI

members: Mauritania and the Comoros. The other member States are Benin, Burkina Faso, Cameroon, Central African Republic, Chad, the Republic of Congo, Equatorial Guinea, Gabon, Guinea, Guinea-Bissau, Cote d'Ivoire, Mali, Niger, Senegal and Togo.

The OAPI administers a common procedure deriving from the uniform system of IP protection and the provisions of international conventions to which member States or the OAPI have joined (figure 14). This IP system is quite original in its design and features. Headquartered in Yaoundé, Cameroon, the organization is the common intellectual property office to all member States. For this purpose, among its 17 member States, uniform law is implemented and applied through the Bangui Agreement and its annexes. OAPI centralizes all the procedures for issuing IP titles, such as patents and trademarks, which are valid in all member countries. There are no national deposit or protection systems that coexist with this regional system, and any deposit made with the Organization is enforceable in each member State. Usually the national liaison structure falls under the Ministry of Industry of each member State; in Mauritania it is the Ministry of Commerce, Industry and Tourism. The national liaison structure serves as a relay between national users and the OAPI General Directorate.

Penalties for IPRs infringement are the responsibility of the courts of each member State, and final judicial decisions, rendered on the validity of titles in one of the member States, are authoritative in all other States, except those contradicting public order and morality.

African Regional Intellectual Property Organization and Organisation Africaine de la Propriété Intellectuelle

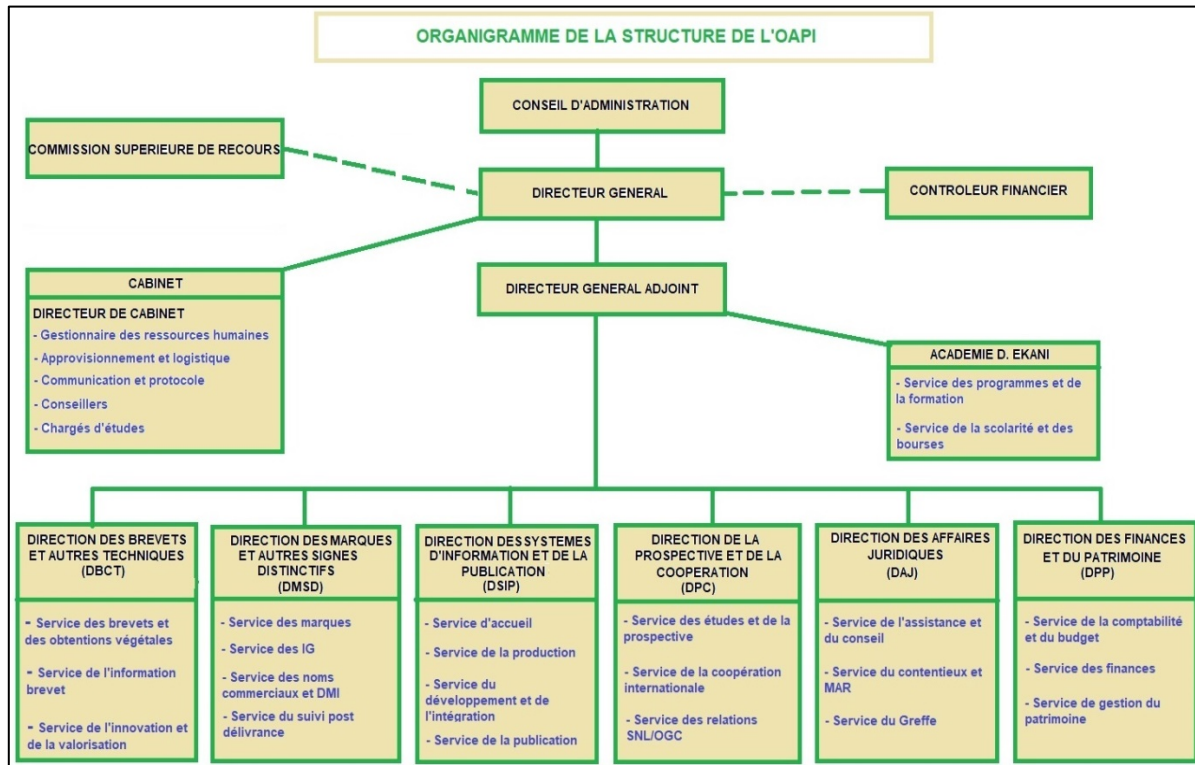
While Organisation Africaine de la Propriété Intellectuelle (OAPI) encompasses most African French-speaking countries, there is another similar system administering IPRs for many African English-speaking countries. The African Regional Intellectual Property Organization, or ARIPO, an intergovernmental organization that facilitates cooperation among its member States on IP matters, established by the Lusaka Agreement on 9 December 1976. Two Arab countries are ARIPO members, Somalia and the Sudan. The Harare Protocol authorizes ARIPO to award patents, register industrial designs and utility models for contracting states. Adopted in December 1982, the Protocol entered into force in April 1984. Currently, the Protocol is in force in all the organization's 19 member States except Somalia. The Protocol was amended in 1993 to incorporate the PCT.

Source: ARIPO, 2016; ARIPO, 2019.

(c) The generation of IPRs

The Mauritanian innovation ecosystem depends greatly universities, incubators and start-ups to generate IP. The Government and donor community views the youth as key social change drivers with an abundance of entrepreneurial potential. However, urbanization and population growth in combination with shortage of economic opportunities has made the youth vulnerable and employment a priority. The country's young, professionally educated and vocationally trained entrepreneurs want to build modern value added enterprises, to the extent they have new innovations and local adaptations of existing enterprise formats available to them.

Figure 14. OAPI organizational chart



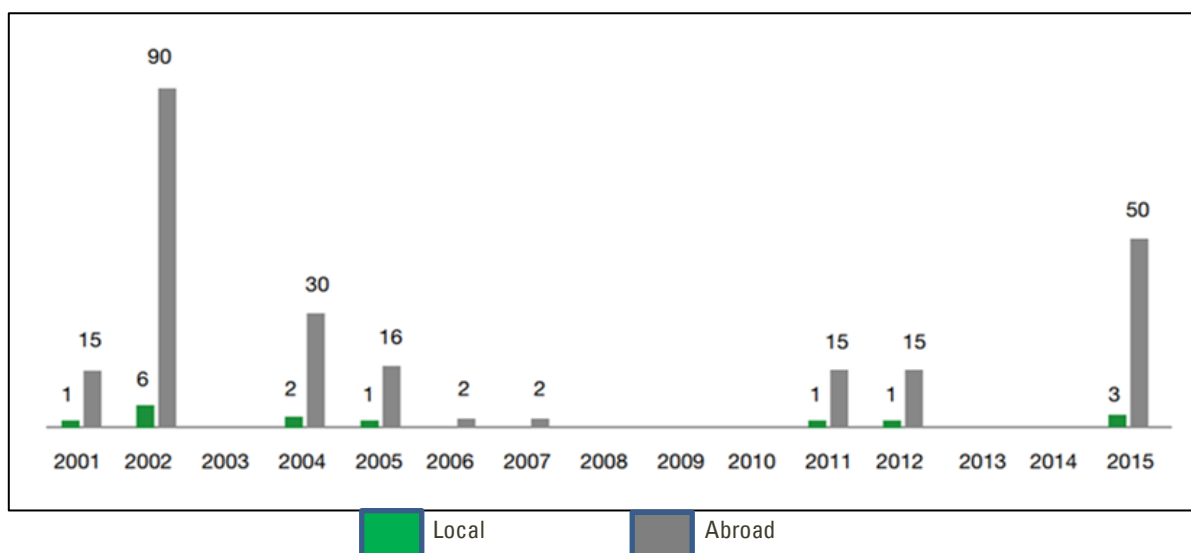
Source: Organisation Africaine de la Propriété Intellectuelle, 2019. Available at <http://www.oapi.int/index.php/en/oapi/organisation/organigramme>.

In a good ecosystem educational and research institutions, commercial associations and incubators are responsible for steering start-ups past initial ideas towards mature enterprises. Therefore, the success of start-ups depends on developing integrated networks that connect the ideas generated by young entrepreneurs with knowledge, technical expertise, funding and mentoring. In Mauritania, entrepreneurs experience challenges advancing from the idea phase to the next phases in enterprise development that requires elements such as

making prototypes, conceiving workable business models and product marketing.

Innovation measurement is generally based on three types of statistics related to patents, trademarks and industrial designs. The data currently available for Mauritania at the specialized agency level, namely the World Bank and WIPO, relates only to patent applications. Their evolution reflects inventive activities and also shows the capacity to exploit knowledge and transform it into potential economic gains.

Figure 15. Patent registration between 2001 and 2015



Source: WIPO, 2019a.

For the period between 2001 and 2015, nearly 250 patent applications were registered on behalf of Mauritania (figure 15). These statistics placed the country at a rank varying annually between the 90th and 110th place out of more than two hundred countries.¹⁹⁷ This fifteen-year national statistic is rather weak compared to what is produced annually in developed countries.

It is very likely that the innovations on behalf of Mauritania are mainly attributable to its diaspora. Indeed, 94 per cent were made abroad by a Mauritanian national at an IP office established outside Mauritania. The evolution of patent applications is inconsistent which, no doubt, reflects the absence of a policy of support for researchers. It is to be noted, however, that not all patent applications result in a patent. Statistics show that one out of two applications is unsuccessful. The available statistics reveal that of the 250 applications

registered between 2001 and 2015 on behalf of Mauritania, only one resulted in the actual grant of a patent. Efforts still need to be made regarding the quality of innovations in the country (figure 15).

4. IPRs in Morocco

Morocco is among the pioneers in innovation and information technology in North African and the Arab region. According to the GII 2018, it has an overall efficiency ratio of 65. Although it lost two points since 2018, the GII 2019 shows that the country coped relatively well in institutions (72nd), knowledge and technology outputs (69th), and creative outputs (69th). Its lowest performances are in business sophistication (122nd) and market sophistication (94th), despite the efforts to further modernize the country's industrial and information sectors. Morocco is particularly distinguished in

patenting and protecting the results of universities and research centres. The positive results of this ranking reflect the dynamism of its innovation ecosystem. Among the strengths of Morocco is the developed IP system providing effective protection for creators and innovators and reassuring its FDI. But a further boost of investments in knowledge creation and impactful R&D will be beneficial to the national economy.¹⁹⁸

(a) The innovation ecosystem

The Maroc Numeric Fund and Innov Invest Fund (IIF) projects have invested funds to promote innovation in information technology and research. Only South Africa and Tunisia outperform Morocco in Africa when it comes to investments in education, knowledge creation and information technology-related businesses. An entire ecosystem has been set up to promote the provision of financing and support for start-ups.

Maroc Numeric Fund (MNF) was created in 2010 as part of the Maroc Numeric 2013 national plan, a strategy developed by the Ministry of Industry, Trade and New Technologies. It was the first (MNFI) Venture Capital fund dedicated to Moroccan technology start-ups with a total size of \$10 million. The fund was held equally by the Moroccan state (through the Morocco Information Technology Company (MITC), the managing company of Technoparks), and four banks (Moroccan Bank of Foreign Commerce (BMCE) Bank, Attijariwafa Bank, Caisse de dépôt et de gestion (CDG), and the Banque Centrale Populaire (BCP) du Maroc). In 2018, a second fund, Maroc Numeric Fund II (MNFII), was created as part of the Innov Invest programme. Its shareholders are the Moroccan Government which holds one third (through the Caisse Centrale de Garantie) and the remaining two

thirds are held equally by MITC and the three banks, Attijariwafa Bank, BMCE Bank, and BCP.

The first Maroc Numeric Fund, MNFI, has invested \$10 million in 17 start-ups, the majority of which are now leaders in their respective fields; and the second fund, MNFII has raised \$20 million and pursues same strategy investing in even more innovative start-ups with an international reach. At the seed stage, the MNF invests in start-ups that already have a product ready for commercialization and have already had a market validation through first sales. In the venture capital phase, MNF invests in innovative start-ups that are less than five years old, which have demonstrated significant revenue growth and require a financial contribution to finance their growth in Morocco and internationally.

The IIF was launched in October 2017. It aims to fund at least 300 innovative projects by 2022 through six incubators: Numa Casablanca, StartUp Morocco, Morocco Entrepreneur Network, The Factory, Solar Cluster, and Maroc R&D. In addition to these, 10 other new structures including CE3M, CEED Morocco, Enactus, Endeavor, Bidaya Space, Kluster CFCIM, and Moroccan CISE were added.¹⁹⁹

In July 2018, 12 start-ups benefited from a total of \$350,000 of the fund's financing for "Innov Idea" through direct financial aid, and "Innov Start" products through loans of honour, that is to say, granted without personal or real guarantees, as part of the component "accompagnement of start-ups". A total of 68 Moroccan start-ups benefited from \$4.8 million in financing from this fund between October 2017 and March 2019.²⁰⁰ Nearly 92 per cent of these companies obtained pre-start-up and seed funding amounting to \$1.3 million. The funded start-ups operate in various sectors of

which 30 per cent are in ICT and 20 per cent in green technologies. The remaining \$3.5 million was allocated as venture capital to innovative start-ups.

The Maroc Numeric Cluster is a public-private mixed governance structure comprising several actors including the State, large companies, SMEs, education and research institutions and aid and financing organizations. The ultimate goal is to bring to the fore innovative projects which have a high added value in the four following niches of ICT: the mobile services; security, electronic banking, digital rights; multimedia; and software.²⁰¹

Valuation and commercialization of IP assets is still underdeveloped marking a difficult reach to the industrial stage of a product of research.

(b) Administration

Two pieces of legislation governed the industrial property during the pre-TRIPS era in Morocco. The first dated from 1916 that covered the former French area but was amended in 1941; the second dated from 1938 and applied to the former Tangier International Zone. Today, the protection of industrial property at the national level is governed by the provisions of the Law No. 17-97 on the Protection of Industrial Property as amended and supplemented by Law No. 31-05 in 2006 and Law No. 23-13 in 2014.²⁰² The entry into force of the Law No. 17-97 on 18 March 2004 has replaced previous laws in Morocco, namely, the laws of 1916 and of 1938.

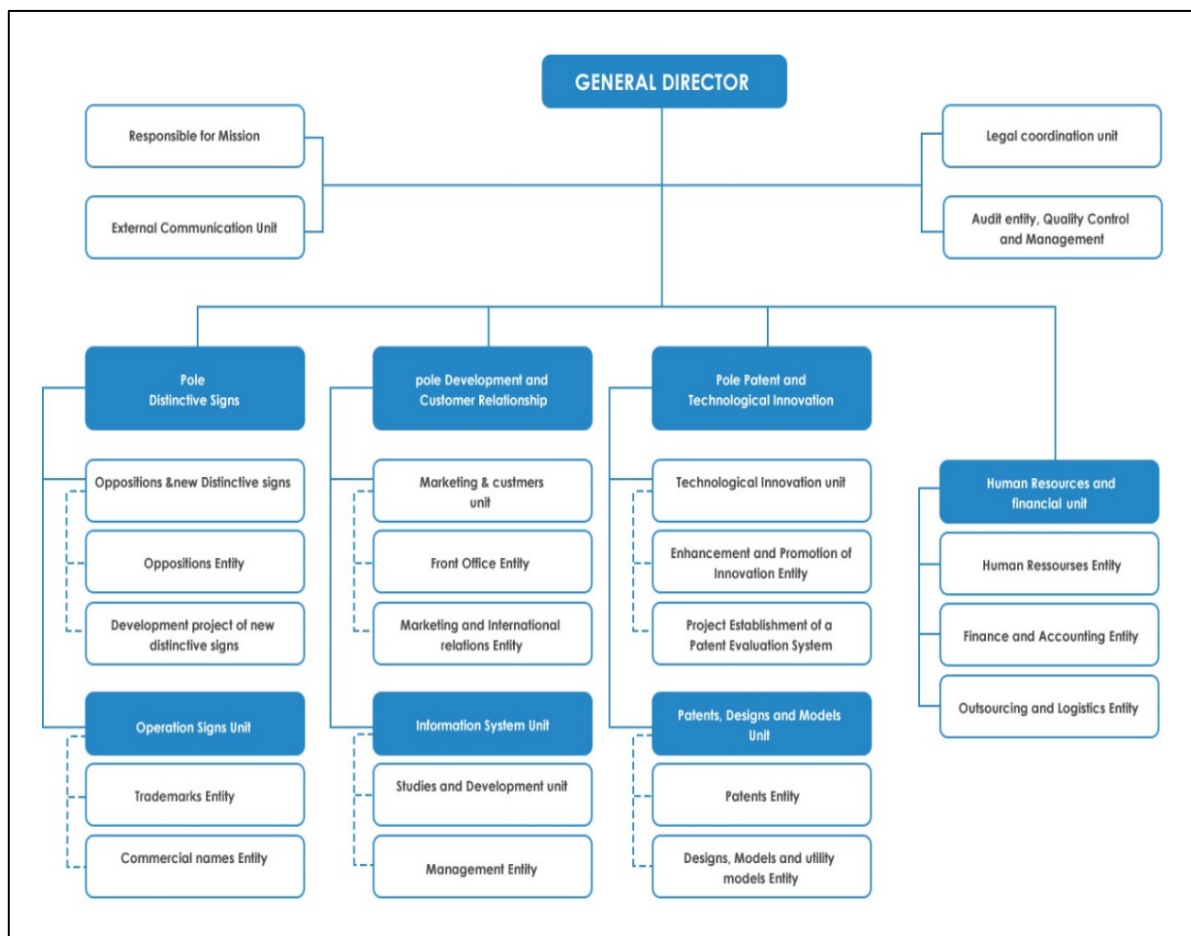
The legal framework for the IP protection is reinforced by the membership to 16 international

treaties on IP, such as Paris and Berne conventions.²⁰³ Some provisions of the Law No. 17-97 are TRIPS-plus and exceed the standards imposed by the WTO, either by expanding and strengthening IPRs protections or by undermining existing flexibilities meant to overcome or bypass these extended protections. However, some provisions were also introduced to mitigate these TRIPS-plus protections.

As for copyright, it is regulated by Law No. 2-00 on Copyright and Related Rights, as amended in 2006. The Bureau Marocain du Droit d'Auteur provides copyright protection and royalty collection payable to authors. The alignment with the highest international IP standards is beneficial to domestic and foreign investors in Morocco.

The Office Marocain de la Propriété Industrielle and Commerciale (OMPIC) is a financially autonomous public institution under the supervision of the Ministry of Industry, Trade, Investment and the Digital Economy. The organization is responsible for the protection of industrial property rights and maintains Morocco's national registers of industrial property and the central trade register (figure 16). The national registers of industrial property are factory trademarks, trade or service, patents, industrial designs and models, geographical indications and origin's labels. The central trade register lists natural and legal businesses occupied by commercial activities in the country. OMPIC accompanies the creation of enterprises while protecting the IPRs, raises IPR awareness among the public, promotes the use of industrial and commercial property and offers services that have been tailored to customers' immediate and future needs.

Figure 16. OMPIC organizational chart



Source: OMPIC, available at http://www.ompic.org.ma/sites/default/files/field/organigramme_en.jpg.

The information OMPIC uses to raise awareness emanates the national registers on industrial and commercial property, official copies, the official gazette and other publications, copies of acts, technical information resulting from patents and trade information such as enterprise creation and financial data from the balance sheets. The

objective of OMPIC is to create a competitive path for enterprises that supports innovation and creativity. The establishment of the Moroccan Academy of Intellectual and Commercial Property has helped to enhance and develop knowledge, skills and expertise in intellectual and commercial property.

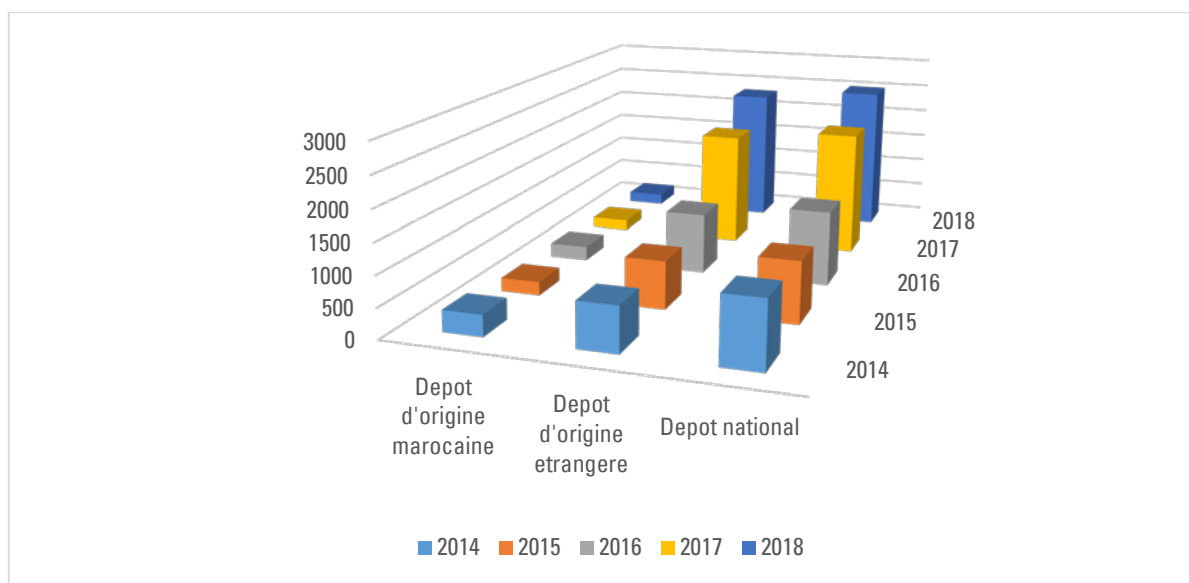
Since its creation, the OMPIC has sought to implement a more structured system of patent and trademark registration in order to stem the financial losses incurred by commercial counterfeiting and improve the general uptake of registration among Moroccan companies and innovators for these entities' own commercial protection.

While the OMPIC model is not common in the Arab region, its advantage is that it facilitates the smooth registration of the business identifiers. It concentrates in one national level entity the Industrial Property Register and the Central Commercial Register. The latter receives the registered declarations and the documents and deeds of companies deposited at the different regional registries; it also centralizes the information on the registered companies for public dissemination. With the commercial names entity and the trademarks entity working closely together, this unifies the business

identifiers such as the trade name, business name, trademark and the logo in one register. This is a genuine solution to the problem that faces many jurisdictions where the business name conflicts with a trademark when those are owned by different entities.

The OMPIC elaborated the Industrial and Commercial Property Strategy 2016-2020, a strategic development plan with a twofold objective. First, it aims to accompany the implementation of national sector strategies (such as the Industrial Acceleration Plan, Morocco Innovation Strategy, Maroc Numeric Fund, Green Morocco Plan) by the promotion of adequate tools to improve competitiveness and innovation; second, it aims to provide tailored solutions for Moroccan companies through the different tools and rights that industrial property offers. Between 2016 and 2018 the number of patent application has augmented drastically, no doubt as a result of this strategy (figure 17).

Figure 17. Evolution of the patent applications



Source: OMPIC, available at <http://www.ompic.ma/fr/content/publications-ompic>.

Table 8. Summary of IP and validity in Morocco

Type of IP (Law No. 17/97 on the Protection of Industrial Property)	Validity
Patent	20 years
Trademark	10 years as from the date of registration, renewable indefinitely for identical periods.
Design	5 years as from the date of registration, renewable indefinitely for two new consecutive periods of 5 years.
Industrial Models	5 years as from the date of registration, renewable for two new consecutive periods of 5 years
Copyright Law No. 2/2000 on Copyright and Related Rights	During the author's life and 70 years post-mortem

Source: Compiled by ESCWA.

The IPRs level of protection in Morocco goes somewhat beyond the WTO requirements. For instance, the copyright term of protection is 70 years after the death of the author. Also, the copyright law establishes strong anti-circumvention provisions, prohibiting unauthorized distribution over the Internet. Additionally, Internet service providers are liable for copyright infringement. In the case of patents, modifications to the terms of patents are possible according to the industrial property law. This provision compensates for hold-ups in awarding original patents. The law also states that any test data and trade secrets submitted as part of pharmaceutical or agricultural chemical product approval to an authority, is subject to protection against unfair commercial use for 5 years and 10 years respectively.

(c) Enforcement

Regarding the enforcement, counterfeiting in Morocco is considered a customs offense. The 2014 Finance Law extended the powers of the Customs Administration in the fight against counterfeiting, particularly regarding the importation of goods bearing a counterfeit trademark. Moreover, since Amendment No. 23-13, border measures are no longer limited to trademarks, but extended to geographical indications and packaging. Moroccan Customs may seize products suspected of violating IPRs. Rights holders can request the intervention of customs officials, but officials also have the right to intercede ex officio. If a custom official act in line with his/her responsibility as an ex officio, the rightful IPR holder must either file a

grievance against the infringer or ask for a temporary ban.²⁰⁴

As for the civil action, it is open to the rights holder or the exclusive beneficiary of the exploitation right. It must be undertaken within 30 days from the receipt of knowledge about the infringement occurrence. Two choices for compensation are possible: a damages claim corresponding to the harm suffered, which is often neglected due to the lack of knowledge of the procedures by the law firms, or because it generates additional costs of expertise; or the attribution of a sum lump sum between \$5,000 and \$50,000, determined by the Court.

There is also a criminal proceeding where any act of counterfeiting can be punishable by a penalty of imprisonment with a fine or only one of the two sentences. Moroccan IP laws criminalize end-user software piracy, providing strong deterrence against piracy and counterfeiting. Ex officio action may be taken in criminal cases, thus providing more effective enforcement. Patent infringements are subject to imprisonment for two to six months, or a fine that can range from \$5,000 to \$50,000. Should the crime be repeated, fines can be doubled, and prison terms can be up to two years. Complicity in the crime applies to someone who deliberately provided storage, sale offers, conducted sales and the import or export of counterfeit products and is subject to the same abovementioned penalties. In compliance with Article 215 of Law No. 17/97, the penalties are more severe if the offender is employed by patent holder. In such a case the payable fine can be between \$10,000 to \$50,000. Alternatively, the person (or persons) can be

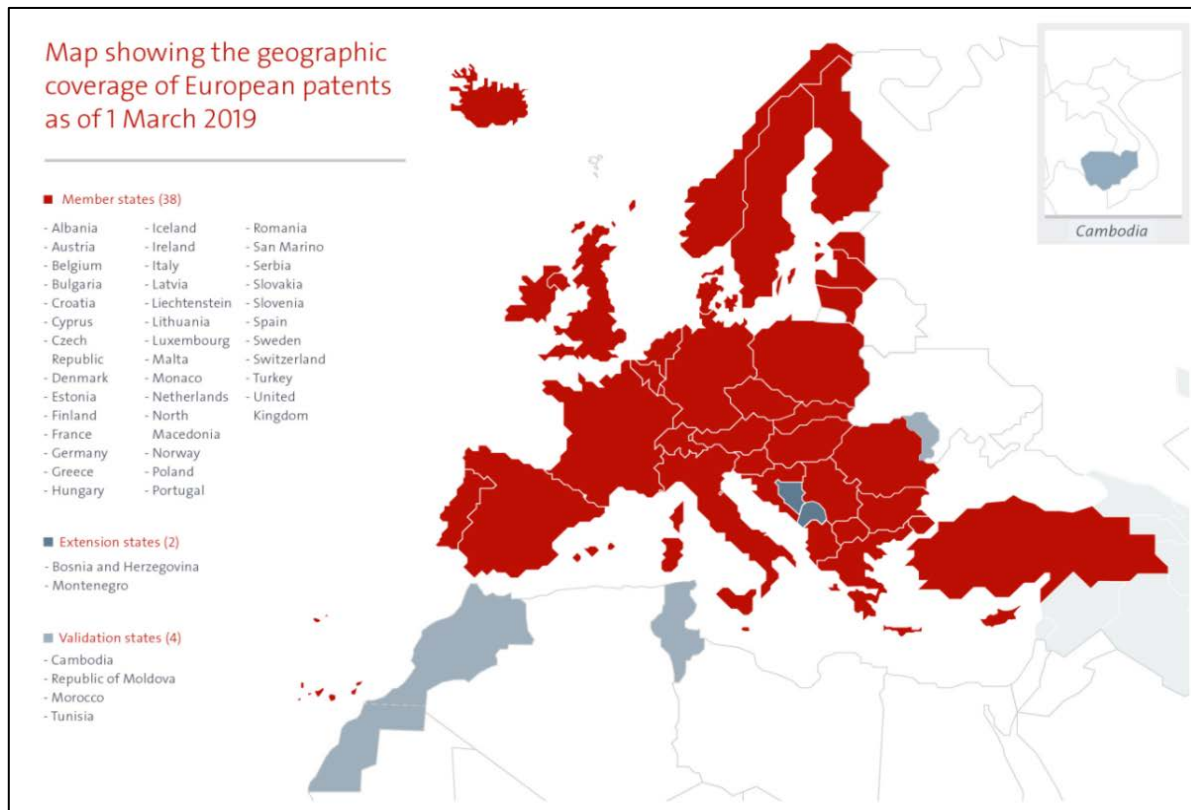
imprisonment for up to two years. The court has the authority to demand the confiscation of the equipment used when the crime was committed and order the destruction of counterfeit goods.

The private sector encourages bolstering specialised courts to make sure that trials are fair. Other challenges in the enforcement of IP laws include the duration and cost of legal proceedings, and that offenders are more likely to be fined than imprisoned. Therefore, actions could be taken so that penalties act as more effective deterrents.

(i) The European patent validation

A validation agreement between the Government of Morocco and the European Patent Organization was signed in 2010 and entered into force on 1 March 2015.²⁰⁵ Such an agreement provides for European patents to have effect in non-European countries (figure 18). Morocco is the first non-member country of the European Patent Organization to validate the legal effects of a European patent on its territory. Due to the agreement, European patent applicants can also obtain patent protection in Morocco simply and cost-effectively. These patents will be subject to national law and enjoy the same rights as national patent applications and awarded patents, as well as the same protection as patents that the European Patent Office (EPO) grants to contracting states of the European Patent Convention.²⁰⁶

It is to be noted that only one other Arab country, Tunisia, has signed a similar validation agreement (box 7).

Figure 18. Validation States

Source: European Patent Office, available at <https://www.epo.org/about-us/foundation/validation-states.html>.

Box 7. Tunisia

On 3 July 2014, the President of the European Patent Office and the Tunisian Minister for Industry, Energy and Mines signed a validation agreement of European patents. Having received approval and been ratified by Tunisian Law No. 2016-13 of 3 March 2016 and Decree No. 2016-23 of the President of the Republic of Tunisia dated 15 March 2016, the validation agreement was then published by virtue of Presidential Decree No. 2017-67 dated 2 May 2017. The adoption of these pieces of legislation has created the legal basis necessary for the validation system to operate. The validation agreement entered into force on 1 December 2017. From that date it was possible to validate, at the applicant's request, European patent applications and patents in Tunisia. This means that patents validated in Tunisia effectively enjoy the same protection as those awarded to the 38 member States of the EPO. Validation in Tunisia is mainly governed by the annex to the validation agreement, as published together with Presidential Decree No. 2017-67 of May 2nd, 2017 in the Republic of Tunisia's Official Gazette No. 39 of 16 May 2017.

Sources: European Patent Office, 2017.

(ii) The Budapest Treaty on Microorganisms

On 20 February 2018 the Moroccan Coordinated Collections of Microorganisms (CCMM) acquired the status of “International Depository Authority” under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure. The depository is located in Rabat and takes all categories of bacterial strains, including actinomycetes, fungi and yeasts.²⁰⁷ It is the first international depository authority established in Africa.

The Budapest Treaty of 1977 focuses on the patent process for microorganisms. Contracting States must acknowledge the microorganisms deposited as a part of the patent procedure, regardless of the depository authority’s location. Therefore, it is no longer necessary to submit microorganisms to the national authority of every country where protection is sought.

CCMM is a central depository where microbiological material is preserved in Morocco. CCMM was set up in 1988 in the Laboratory of Microbiology and Molecular Biology (LMBM) of the National Centre for Scientific and Technical Research in Rabat. They are 90 per cent funded by the Moroccan Government.

CCMM was set up with the aid of a network of institutions that chose to deposit their microorganisms and all information relating thereto with them. These institutions include universities, research centres and service centres linked to several ministries in Morocco. The network is formed around the CCMM,

analysis platforms and innovation centres that arose as a result of the recently created R&D network for the utilization of Moroccan genetic and microbial resources (ReVarGEM).

The main aims of the CCMM are to share and exchange biological resources and information relating to preserved microorganisms and pool experience and expertise in the field of fundamental and applied biology and biotechnology. They provide a link between Moroccan universities, research centres and bioindustries in order to promote research into, protection of and the rational use of Moroccan microbial biodiversity.

5. IPR in Oman

The Omani economy has been on a steady transformation course through various development plans, beginning with the first five-year plan from 1976 to 1980. At the instruction of His Majesty Sultan Qaboos bin Said, Oman’s “Vision 2020” was set in 1995.²⁰⁸ It was an ambitious plan designed to steer the Sultanate toward a more sustainable and diversified economy by using oil revenues to boost investments in health, education, and social services, to better train citizens, and raise living standards. It outlined the country’s economic and social goals, including an economic and financial stability through a reshape of the government role in the economy. It broadened the private sector participation and diversified the economic base and sources of national income.²⁰⁹

In January 2019, a new plan “Vision 2040” was launched after by royal directive of the Sultan. The comprehensive plan is formulated on the

basis of community-wide consensus and through the participation of diverse social groups. Vision 2040 is an essential reference guide for future planning as it integrates the country's socioeconomic actualities and is orientated towards Oman's future.²¹⁰ Vision 2040 operates as the guiding document for the development of national implementation programmes, including the next five-year plan for 2021-2025.

Oman has the potential to establish a highly innovative start-up network that is synchronized with its national objectives and becomes a regional start-up hub. Although various incubators and funds were set up in recent years, it lacks a single coherent framework that promotes innovation and aligns with the research and policy agendas of its ministries, public bodies, and academic institutions.

(a) The National Innovation Strategy

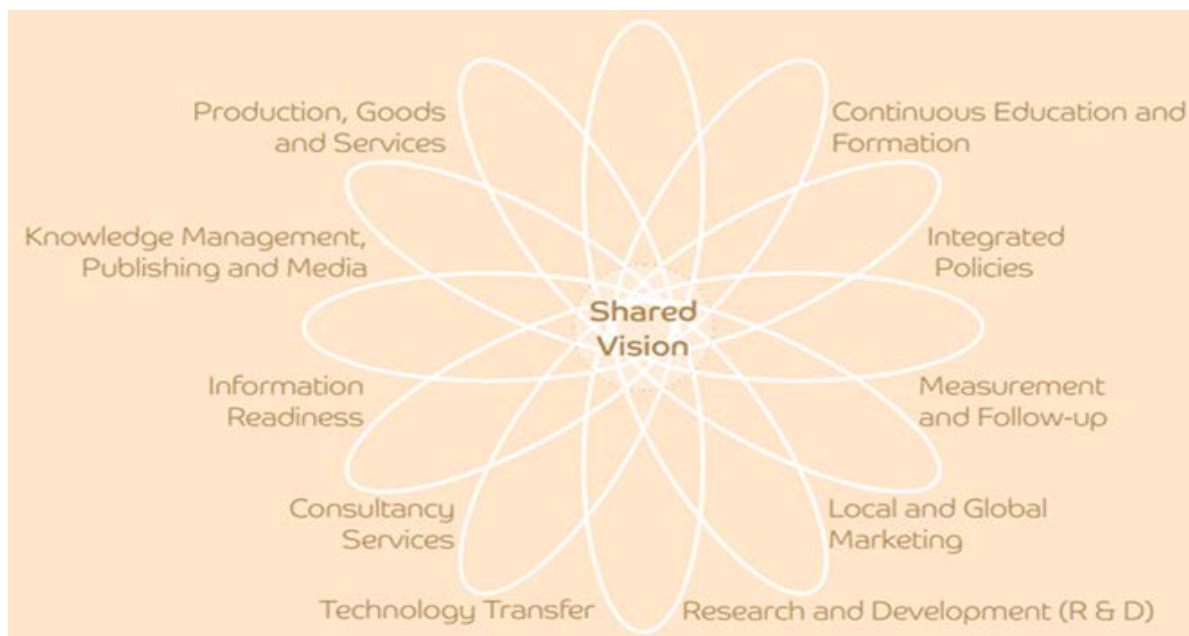
Oman is a high-income economy and one of the fastest developing economies. It is placed in the top 50 for leading in peace worldwide.²¹¹ The nation's economy is not dependent only on oil and gas resources but has diversified economic activities including fishing, light manufacturing and agriculture. With a stable government, relatively low taxes and recognition for technology's role in economic development, Oman is an appealing investment destination for entrepreneurs and investors, foreign and domestic, looking for tax havens.²¹² This is foreseen by the Oman Research Council that issued a National Innovation Strategy (NIS) in 2017 aiming at the creation of a national system for innovation with standard vision and clear policy to achieve specific goals and pre-set priorities. The NIS acts as a road map for

potential innovators and those that want to move beyond traditional goods and services to a creative and knowledge-based economy. The NIS is employing various initiatives to boost innovation channels and ensure sustainability. The initiatives to be deployed include the formulation of national policies and legislation, the establishment of innovation incubators and R&D centres, technology transfer, improved international communication, the promotion of innovation and creativity among local entrepreneurs, doubling the number of business and innovation incubators at universities and colleges and the development of school curricula that encourages science, mathematics and reading skills.

The strategy is a result of the Vision 2040 (figure 19) analysis and those of experts that helped in arranging the NIS. In collaboration with UNCTAD, they analysed the challenges listed in the STI policies, through which they approved four main pillars: economic diversification; intellectual property and knowledge transfer; institutional and social integration; and human capital.

The IP and knowledge transfer pillar is focused on Oman's transformation into a knowledge-based society along with the implementation of an effective IPR protection system that would benefit, nationally and internationally, the production of innovative ideas, goods and services. The presence of this pillar made the development of a National IP Strategy for Oman, in collaboration with all stakeholders and with the assistance of WIPO, possible. The suggested strategy includes seven initiatives on specific topics including capacity-building in IP, IP infrastructure, financing IPR activities and IP culture.

Figure 19. The Oman Vision 2040 features



Source: The Research Council (2017). The National Innovation Strategy. Insights Scientific, July, pp. 6-11. Available at <https://www.trc.gov.om/trcweb/sites/default/files/2017-08/scientific%20insights.pdf>.

Today in Oman, as stated by commentators, IP laws provide more than enough legal rights for authors and innovators. What the law needs to do is to provide reasonable freedoms for the users so that society can benefit from the protected works to create more works that reflect the identity and culture of the country, instead of consuming culture without producing anything in return.²¹³

(b) Administration

The main source of IP is the Industrial Property Law promulgated by Sultani Decree No. 67 of 2008 repealing Sultani Decree No. 38 of 2000. It governs the protection and use of patents, trademarks, trade secrets, utility models, industrial drawings, geographical indications, topography of integrated circuits and protection

against unlawful competition in the Sultanate. Ministerial Decision No. 105 of 2008 sets out the Executive Regulations for this law. The Copyright and Neighbouring Rights Law was promulgated by Sultani Decree No. 65 of 2008 repealing Sultani Decree No. 37 of 2000. It protects creative works of literature, arts and science. Oman holds membership to a number of international treaties, conventions and protocols including GCC, WTO, WIPO, Berne Convention, Paris Convention, Madrid Protocol and PCT.

It is to be noted that in 2017 Oman became the fourth state to implement the Unified Trademark Law for the GCC States. Sultani Decree No. 33 was issued on 25 July 2017 with immediate effect. The GCC Unified Trademark Law was approved in 1987 by the GCC Trade Cooperation Committee with amendments ratified in 2006

and 2013. Implementing regulations were only issued in December 2015 making the enforcement of the law possible. Bahrain, Kuwait, Oman and Saudi Arabia have since replaced their national trademark laws with the GCC Unified Trademark Law.

The Industrial Property Register at the Ministry of Commerce and Industry is the national office responsible for registering and issuing IP titles, such as patents, utility models, industrial designs, layout designs (topographies) of integrated circuits, trademarks and geographical indications.

Many enforcement measures are available to an aggrieved party if an IPR is violated. Interim measures may be issued by the judiciary to stop existing infringement or prevent possible infringement. Damages compensation may also be awarded without hearing from the offending party in cases where delays may bring about greater damage. If the court rule that a claimant has suffered damages due to IPR infringement, then compensation is determined. This may be in the form of a payment that is equal to the damages suffered. The damages are calculated based on any profits earned by the offender as a result of infringement. IPR owners also have options that can be exercised at the country's borders. The IP owner can request, if they have evidence of IPR infringement, that customs halt the clearance and release procedures of goods.

(c) Generation and management of IP by universities and start-ups

(i) The Research Council

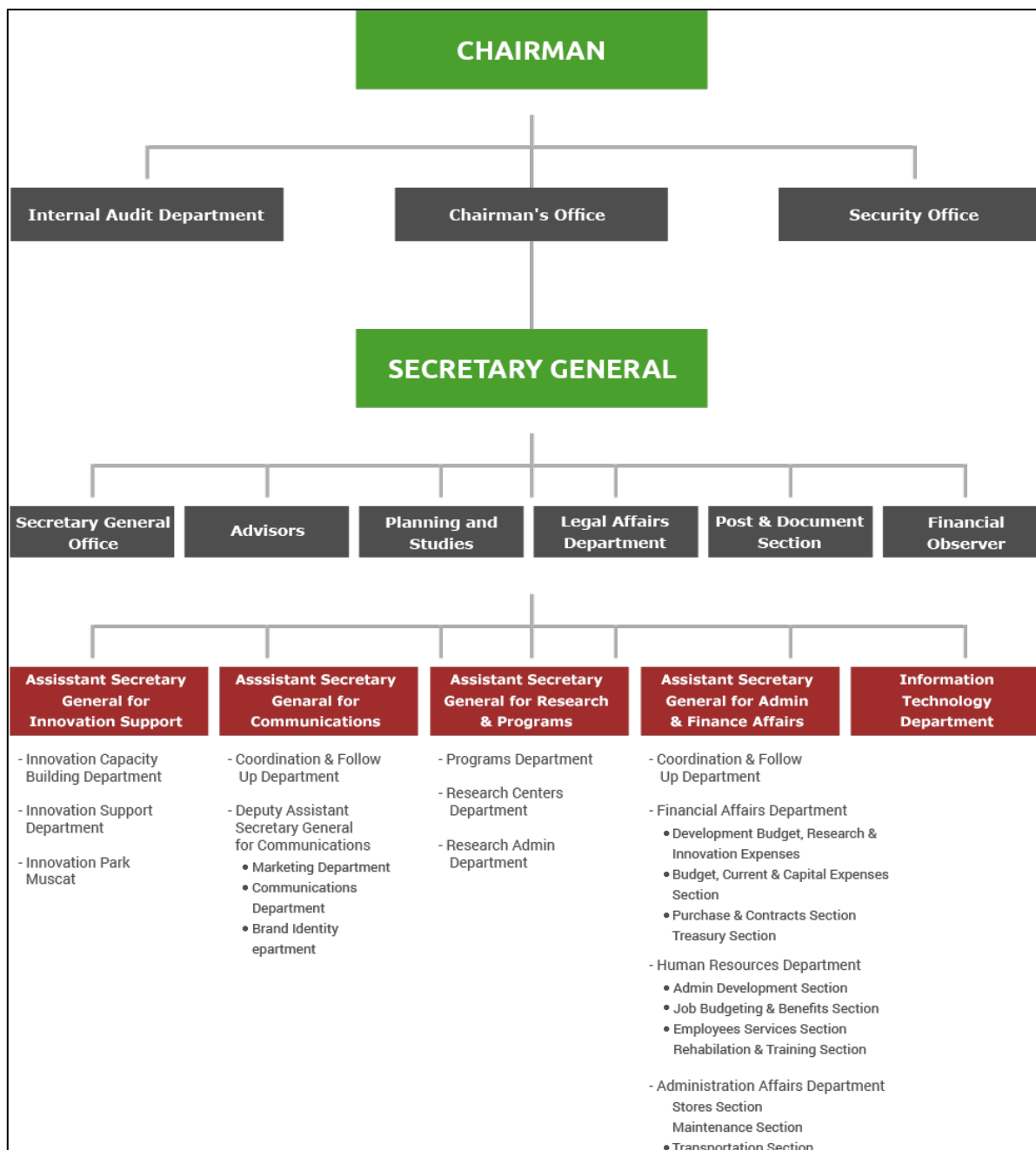
Established in 2005, the Research Council (TRC) provides innovators with access to locally based, high quality technology, information and other services. The Council also helps

innovators to make use of their innovative potential and the application, protection and management of IPRs (figure 20). Its mission is to create an innovation ecosystem that responds to local needs and international developments, to foster social harmony, and to lead to greater entrepreneurship that helps grow the industry through creativity and excellence. The vision of the Council encompasses several ambitions including establishing Oman as a regional innovation hub and a leader in new ideas, products and services, the largest regional research capacity, a research culture that reacts effectively to local socioeconomic needs and an infrastructure that caters for evidence-based policymaking. To achieve the vision several objectives were identified such as developing research capability mechanisms, achieving research excellence, building knowledge transfer and value capture and providing an environment enabling research and innovation.²¹⁴

The offered services range from access to patent and scientific and technical databases to assistance and advice on using databases, which gives MSMEs a competitive edge by increasing their competitive intelligence capacity. It is specialized in different sectors in view to boost a diversified economy. It covers agriculture and food science, chemistry and chemical engineering, civil engineering, electrical and electronic engineering. The services are also offered in English and non-residents can also benefit from them.

TRC has undertaken many initiatives and projects such as Oman Animal and Plant Genetic Resources Centre (OAPGRC), the Innovation Park in Muscat (IPM), the Institute of Advanced Technology Integration (IATI), the Oman Virtual Science Library and Oman Research and Education Network (OMREN).

Figure 20. Organizational chart of the Research Council



Source: The Research Council, available at <https://www.trc.gov.om/trcweb/about/structure>.

The **IPM** is the country's most recent science and technology development project. Its purpose is to boost scientific research, innovation and galvanize local and international collaboration between academic, private and industry sectors. It concentrates on enterprises in the sectors of energy, food, biotechnology, health and water and environment that provide essential access to facilities, services and capacity.

IPM is to be implemented in three stages over ten years and is located near Sultan Qaboos University, stretching over 540,000 square meters. The first stage, initiated in March 2013, includes construction of the main building of the innovation centre, the social centre and the fabrication workshop. The second stage includes setting up of institutes focused on energy and health sectors, a hotel and a mosque. The third stage includes creating other institutes for food, biotechnology and water and environment sectors and an international school. IPM provides spaces for setting up R&D centres by local and foreign investors.²¹⁵

IPM has a business incubation programme that provides beginner innovators and entrepreneurs who are setting up start-up ventures with an innovation-enabling environment. It cultivates cooperation among tenants and gives access to the facilities of the park. MSMEs, entrepreneurs and start-ups focusing on the four key sectors, namely energy, food and biotechnology, water and environment or health, and can apply online to the incubator. IPM also offers long-term investment possibilities for large enterprises through plots that can be rented for research and development purposes. Large local and multinational research corporations that focus on the four key areas can apply online. The incubation programme prepares

legal documents and policies, including for IP and commercialization.

OMREN provides a maintainable infrastructure that supports the development of an efficient national innovation ecosystem. It gives the research and education society in Oman a network and collaboration infrastructure devoted and tailored to their needs. This influence and fosters the growth of innovation, research, education and international e-collaboration.

TRC initiated and supports OMREN in partnership with the national Internet provider OmanTel. The services offered by OMREN enriches the research and the education sector activities. These services include a devoted high capacity private end-to-end circuits between research centres and universities, a local Internet Service Provider (ISP) leased line (ILL) connection, international connection and video conferencing services for e-collaboration.

(ii) Sultan Qaboos University

Established in 1986, Sultan Qaboos University (SQU) is the biggest and the oldest public university in Oman. Its mission is to achieve excellence in teaching and learning, research and innovation and community service. The university encourages scientific analysis and creative thinking principles, takes part in knowledge production, development and dissemination and cooperates with national and international societies.

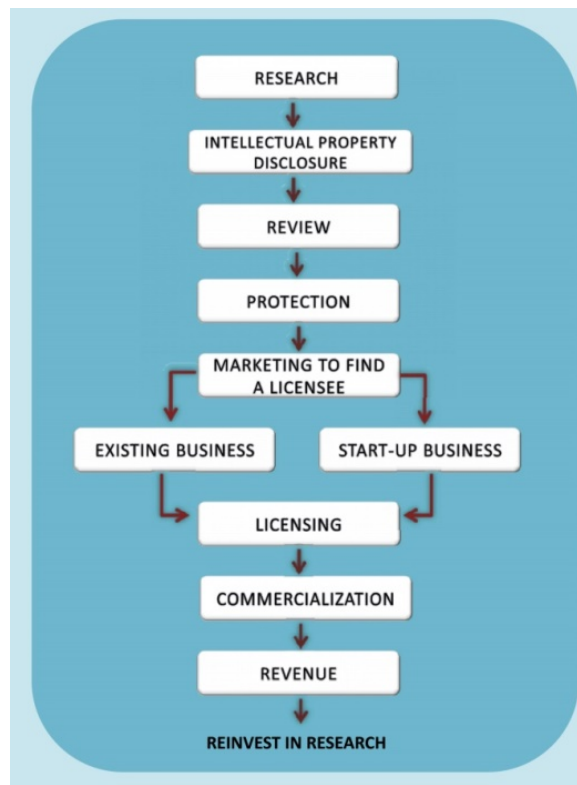
SQU has grown into a university involved in joint projects and partnerships worldwide. The most recent was the successful IP Summer School held in 2018 in collaboration with

WIPO. The university is the only public institution that has research and education centres concentrated on all world regions and that takes part in international conferences, workshops, training and collaborative projects. It has twelve research centres and ten support centres covering many sectors of the economy.²¹⁶

An International Cooperation Office (ICO) helps the university achieve its goals using an internationalization process. Over time the office's role has evolved to include agreements with international organizations, student and researcher exchange programmes, joint workshops, international organization and global initiative memberships.

SQU has an Innovation and Entrepreneurship Department (I&E) that manages all IP generated by staff and students. All innovations and other created works and IPRs should be disclosed to I&E that has three sections, the IP, the Students' Initiative Support and the Technology Transfer Unit. The objectives of the I&E are to exploit the SQU-owned IPRs based on the needs of industry, the university, the faculty and the country. I&E markets SQU research to promote links between the university and potential industrial partners. This creates more opportunities for the faculty to be a part of sponsored research. The department maintains close and continuous interaction with industry to identify research opportunities that can aid industries. It provides SQU and its research centres with thoughtful and up-to-date consulting concerning its IP policy, and it assists the university to create and develop research park and technology incubators (figure 21).

Figure 21. The innovation process



Source: Sultan Qaboos University, available at <https://www.squ.edu.om/ied/in/ip>.

It has established an IP policy in a well-detailed document with the vision to promote innovations and to facilitate the protection of IPRs generated as SQU. The policy is aligned with the Omani copyright law and with the industrial property law. The main objectives of the policy are to explain the purpose and value of IP, to define the ownership, the distribution, the commercialization and managing rights associated with the research product, and to recognize and encourage research and invention by providing for the share of tangible rewards resulting from the commercialization of such research and invention.

The patentable inventions conceived or first reduced to practice by SQU personnel in the conduct of university research belong to SQU. It includes the ownership of all conceived IPRs created by SQU faculty, staff, students and others participating in SQU programmes as a part of or as a direct result of any research activity in SQU. As for the traditional academic works, ownership of copyright remains with their author, unless this latter used SQU resources to create the work, including software. Copyright on all original teaching material developed by SQU personnel will be vested to SQU.

The royalties that accrue from exploiting the IPRs are distributed at a net value to the inventor (70 per cent), and to SQU (30 per cent). The IP policy further states that SQU helps in facilitating the commercialization of the IPRs by identifying potential licensee, and SQU is also entitled to approach, negotiate and sign any IP agreement. In the event SQU does not take reasonably effective steps to help commercializing the IPRs within five years after the IPR first filing date, it may reassign the rights to the researcher or inventor upon request.

(iii) The Oman Technology Fund

The Oman Technology Fund (OTF) aims to put Oman firmly on the map of knowledge leaders in the Middle East region. It works to effectively attract promising projects to launch their operations in Oman, enhance the knowledge-based economy and develop the ICT sector in general.

The OTF operations focus on defining the futuristic ideas in the technology sector and amongst the entrepreneurs who have high potential technology and technical innovation ideas and projects, within the geographic area

covering Oman and the Middle East, through a phased plan that includes investment, guidance and cooperation.

The OTF has three investment projects: investment in the early stage of ideas, under the investment programme OTF Techween; the acceleration stage OTF Wadi Accelerator; and growth phase OTF Jasoor Ventures. OTF aims to become the innovation hub in the region and position Oman as the preferred destination for national and international entrepreneurs, attracting emerging technology companies and venture capitals.

6. IPR in Saudi Arabia

Saudi Arabia's Vision 2030 has set objectives and targets to transform the economy of Saudi Arabia from oil-dependent to knowledge-based.²¹⁷ Many initiatives are being rolled out in technology, entrepreneurship and digital innovation – from creating jobs, building capacity, updating regulatory frameworks, and supporting SMEs to accelerating, incubating and investing in start-ups.²¹⁸ The growth of international trade is rooted in several legislations relevant to IP, as well as providing assistance to stakeholders to improve the business environment²¹⁹ and catching the attention of top global investors, as stipulated by the 2030 Vision.²²⁰ Promoting culture and entertainment, enjoying a healthy lifestyle as well as developing the Saudi cities is to be achieved in the course of the IPRs' protection that contributes to creating a social and cultural well-being and a thriving economy as projected in the 2030 Vision.²²¹

(a) Administration

The first Patent Law was issued by the Royal Decree No. M/38 of 1989; it was repealed by the

Royal Decree No. M/27 of 2004. Saudi Arabia is a GCC member and party to many WIPO administered I- related treaties, mainly the PCT.²²²

(b) Enforcement

Enforcement of IPRs in Saudi Arabia is done through action on counterfeit good in the country and at borders. A patent infringement action is initiated by submitting a statement of claim before a special quasi-judicial dispute committee formed of three law specialists and two technical experts.²²³ The Committee has jurisdiction over the disputes and appeals against decisions issued in connection with protection documents and over the criminal lawsuits for patent infringement. The decisions of the Committee are subject to appeal before the Administrative Court in Riyadh, whose judgments are also subject to appeal before the Administrative Court of Appeal.²²⁴ There is no fee to bring lawsuits before the Committee and there are no pre-trial procedural stages. There are no hearings unless the Committee decides otherwise. The Committee usually takes 16 to 24 months to issue a decision.

For counterfeit products entering Saudi Arabia, a complaint can be filed with customs requesting that infringing imported goods be seized and destroyed. To do so the IPRs owner must hold a registration deed in Saudi Arabia regarding the relevant infringed right. No prior registration with customs is required, and the IPRs owner is notified of the deadline for responding with a complaint. The owner must then file a complaint with customs, requesting that the goods be seized and destroyed.

The Saudi Authority for Intellectual Property (SAIP): The SAIP is undoubtedly the newest and the most advanced institutional body in the Arab region regulating the IP field with the best

international practices to promote competitiveness.

Established 27 March 2017 as an entity of the Ministry of Commerce and Investment,²²⁵ it is one of the initiatives of the Trade and Investment System within the National Transformation Program 2020 to attract foreign capital. As the IPRs administration and registration were scattered among many ministries, their centralization under the SAIP is meant to strengthen the protection, organize and empower a stronger IP environment.²²⁶ The mission of the SAIP is to foster the competitiveness of the national economy, to support the development of IP culture as well as transforming SAIP into an IP hub for the region.²²⁷

Its core business is the administration of IP, the offering of IP services, the creation and commercialization of IP and IPRs enforcement. In its strategic goals, SAIP is the owner of the national IP strategy. It develops IP laws and regulations, raises awareness for the IPRs value, orchestrates the development of the IP ecosystem in Saudi Arabia, provides IP useful information, collaborates closely with enforcement agencies to protect IP and cooperates with IP organizations and promotes its IP interests abroad. The SAIP covers all IP areas including copyright and neighbouring rights, patents, industrial designs, trademarks, and plant varieties.

The Saudi Patent Office (SPO): The SPO is the receiving agent and registrar for patents, layout designs of integrated circuits, plant varieties and industrial designs,²²⁸ from filing to granting applications.²²⁹ The office employs highly trained, experienced members including examiners, legal advisors, patent informational specialists and administrative staff.²³⁰ They offer customer service, live support, telephone

assistance and a fully-fledged website giving access to an online national application filing system and to an online patent search tool. The average time for granting a patent is between 12 and 24 months with a decrease of 29 per cent in 2015 compared to 2014.²³¹

There was a noticeable 205 per cent increase in the number of applications filed in 2015 compared to 2014, for a total of 2,408 applications of which 30 per cent were domestic. The increase in foreign applications filed in Saudi Arabia was a result of the accession to the PCT in 2013 which gives applicants up to 30 months to decide where to file their patent applications. The number of PCT applications that entered the national phase in accordance with the Treaty reached 1,646 applications. Compared to 2014, the number of granted patents also increased in 2015 because of the increase in number of patent

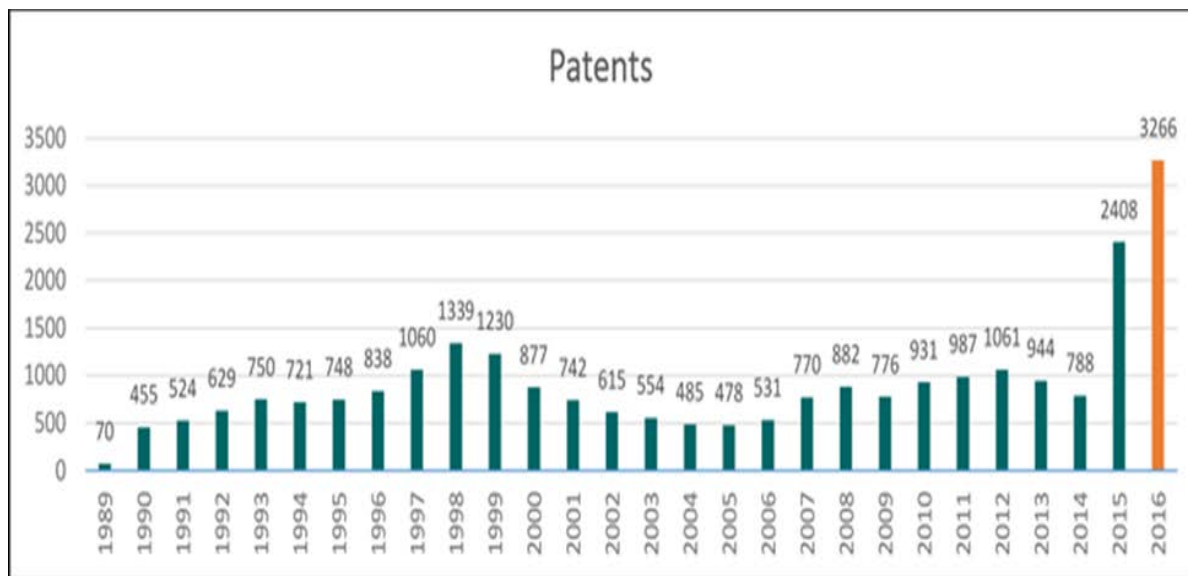
examiners and the development of the e-filing service (figure 22).

Table 9. Total pendency by disposition date

Year	Total per month
2011	39
2012	43
2013	38
2014	44
2015	31

Source: Saudi Patent Office, available at www.kacst.edu.sa/arb/IndustInnov/SPO.

Figure 22. Patent filing numbers since 1989



Source: Saudi Patent Office, available at www.kacst.edu.sa/arb/IndustInnov/SPO.

(c) Generation and management of IPRs by universities and research organizations

King Saud University: In Saudi Arabia there are around 40 universities, most of which were founded after 2000. The King Saud University, established in 1957 in Riyadh, was the first Saudi university. It has more than 20 research centres and institutes, research chairs, a Distinguished Scientific Fellowship programme and a Nobel Laureates programme.²³² It is the most prestigious university in the country and has been granted more than 50 domestic patents and was ranked forty-ninth in the top 100 worldwide universities granted United States utility patents in 2015.²³³ The university has an IP and Technology Transfer Program and an IP and Technology Licensing Program (IPTL). The IPTL offers a full service an IP law firm provides, mainly legal representation in acquisition and enforcement of IPRs; business transactions involving IP; technology transfer agreements; set-up and management of IP administration programmes; IP audits and due diligence; IP valuations; IP infringement assessment and IP licensing services. Following the IPTL bylaws, the financial revenue from the exploitation of registered patent shall be distributed between the inventor (60 per cent), the programme (10 per cent), the inventor's department (10 per cent), the inventor's college (10 per cent) and the scientific research savings (10 per cent).

King Abdulaziz University: Established in 1967, the university is considered a pioneer in higher education. It has had an IP administration unit since 2013 and has been granted around 50 United States patents between 2009 and 2017. It has a Creative Development Programme and an

Innovation and Creativity Development Lab that helps innovators achieve their ideas and prototype work.²³⁴ The IP Unit also offers a Patent Marketing Plan including advertising campaigns, participation in technical scientific publications, communication with marketing companies and the promotion of inventions. It offers a template agreement between the university and the inventor in which the distribution rates are 60 per cent for the university and 40 per cent for the inventor.²³⁵

King Fahd University of Petroleum and Minerals (KFUPM): It is a leading educational organization for science and technology established in 1963 in Dhahran. Its vision is to be a preeminent institution known for its globally competitive graduates, cutting edge research, and leadership in energy discoveries.²³⁶ It has an IP Office within its Innovation Centre and more than 250 patents granted worldwide, mainly in the United States, Canada and Japan. The University has a detailed IP Manual providing a university frame for IP identification, protection, management and commercialization.²³⁷ The distribution rates are 75 per cent for the university and 25 per cent for the inventor.²³⁸

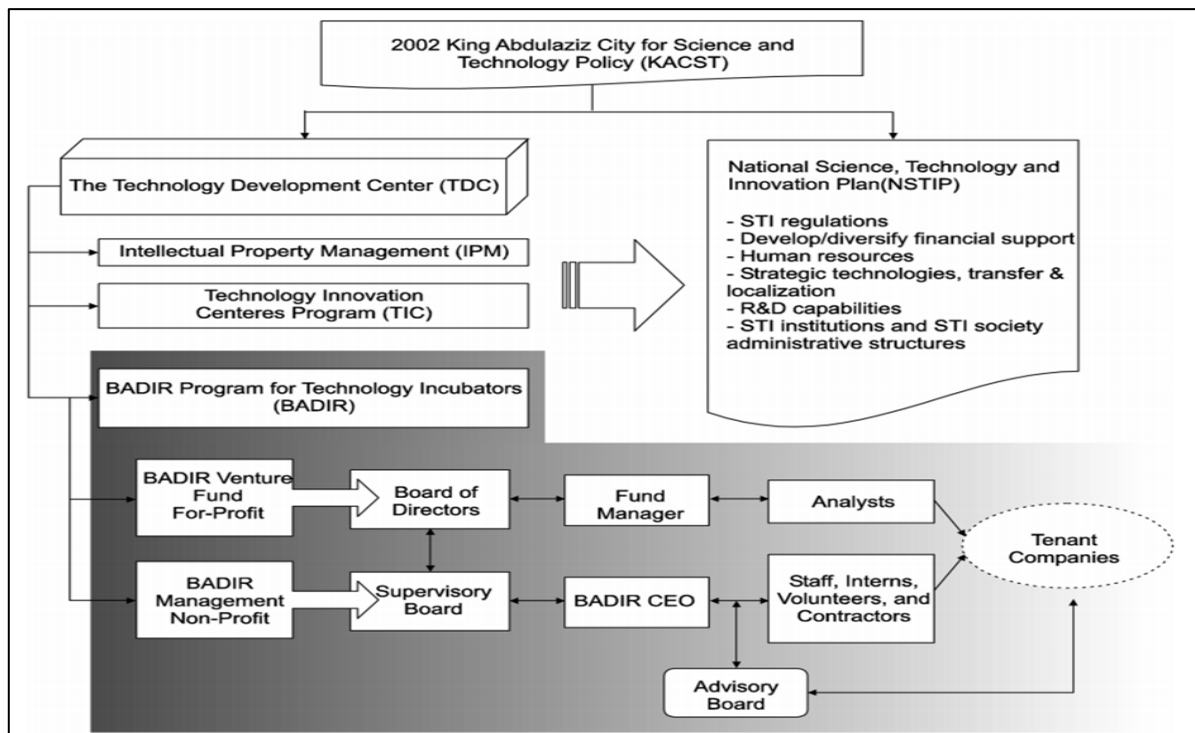
The Innovation Centre manages ideas depending on their approach to innovation. The management style chosen is either direct patenting used for projects with an incremental innovation approach or proof-of concept used for break-through innovation projects. Additional options are also available for innovation approaches categorized as entrepreneurial business concepts. One option provides entrepreneurs without business plans with assistance on planning, feasibility studies

and market surveys from the Business Development and Market Intelligence Unit. Another option is designed to aid entrepreneurs with verified products and that are ready-to-launch business projects.

*King Abdulaziz City for Science and Technology (KACST):*²³⁹ The university has contributed to the progressive transformation of the Saudi Arabia's capabilities to affect new scientific, technological and innovative change across a wide range of industries (figure 23). KACST proposes national policy for the development of science and technology and develops strategies and plans necessary to implement them. KACST coordinates with government agencies, scientific institutions and research centres in the country to enhance research and technology

development and exchange information and expertise. It fosters national innovation, international cooperation and technology transfer between research institutes and industry. One of its strategic objectives is to develop an R&D infrastructure with fully functioning centres in all scientific disciplines and make them regional leaders in patent ownership and issuance. KACST is a regulator, promoter, scientific and technology researcher, funding agency and chief policy executor. Its programme initiatives and policy tools moves the Kingdom along its path toward a knowledge-based economy. KACST services are the biggest in the public sector's contributions to raising the levels of scientific and technical information in Saudi Arabia. It manages the Saudi Patent Office (SPO).

Figure 23. Organizational structure under the National Science and Technology Policy



Source: Khorsheed, Al-Fawzan and Al-Hargan, 2014, p. 240.

Table 10. Patents granted for national research institutions in 2015

R	Institutions	Patents	Percentage
1	King Saud University	51	77%
2	King Abdulaziz City for Science and Technology	9	14%
3	King Fahd University of Petroleum and Minerals	2	3%
4	King Abdullah University of Science and Technology	1	1.5%
5	Pharmaceutical Solutions Industry Ltd	1	1.5%
6	PHARMACYCLICS, Inc.	1	1.5%
7	King Abdullah International Medical Research Center	1	1.5%
	Total Patents granted for National Institutions	66	100%

Source: Saudi Patent Office, available at www.kacst.edu.sa/arb/IndustInnov/SPO.

KACST promotes R&D and brings industry, academia, and government together. It is the catalyst for the knowledge-based transition and serves as a significant resource for the national innovative ecosystem. Some of its primary strategic planning programmes are: BADIR Program;²⁴⁰ the TICs programme;²⁴¹ the national innovation ecosystem in collaboration with the Al-Aghar Group;²⁴² and the IP Management programme which manages the process of IP development by working with inventors to establish processes, policy, and activities that move IP from conceptualization to commercialization.²⁴³

BADIR Programme for Technology Incubators: is one of KACST technology's programmes established in 2008. It is a comprehensive national programme that seeks to activate and develop technical business incubators. It focuses on business development leading to a knowledge-based society and economy in the Saudi Arabia. It also enhances the idea of

technical entrepreneurship and generates successful business opportunities from projects and technical research. This is achieved by supporting entrepreneurship, innovation and technology incubators and providing an environment in which rising technical institutions can grow based on a risk reduction principle. The Inventors Service Office under the BADIR Programme acts as a consultant for Saudi inventors. It assists them in conducting the preliminary research and provides them with the research findings by performing competitive intelligence within patents international databases. Consultation and guidance are then provided for the patent drafting, and the office covers all the costs of the patent application filing and the renewal fees up to 20 years.

The Inventors Service Office also conducts follow-ups on applications submitted to the SPO by inventors, to guarantee that applications are admitted, and documents issued. It provides the

financial support for building the prototypes and conducting experiments for highly valued inventions and promoting the invention to the investment stage. In addition, BADIR assists entrepreneurs in implementing their business growth strategy through collaborations on market focus development, business plan refinement, establishing a strong management team, procuring capital if necessary, and IP protection for start-ups. Training programmes, seminars and workshops are held to disseminate knowledge in the field of IP. The Inventors Service Office reviewed 3,217 patent applications between 2015 and 2016, covering filing costs exceeding 13 million Saudi riyals.

7. The Patent Office of the Gulf Cooperation Council (GCC PO)

The Patent Regulation of 1992 established a unitary patent right covering the GCC member States, and the GCC patent automatically extends to the six member states; their individual selection is neither possible nor necessary. This regulation was amended in 2000 and a novelty requirement for patentability was added. The GCC patent system is not part of the PCT, nor a member of the Paris Convention, but it meets their priority rules. Its provisions are broadly compliant with the TRIPS Agreement regarding novelty, the inventive step and the industrial applicability criteria. It adds that inventions must not be in conflict with the sharia law.

The GCC PO is a regional registration office located in Riyadh and plays an important role in encouraging scientific research, innovation, creativity, invention and knowledge spread in GCC member States by granting legal protection for inventions and innovations, in addition to their publication.²⁴⁴ It undertakes full formal and substantive examination of patent

applications from the six GCC member States in line with international standards. All non-residents wishing to apply for a GCC patent must be represented before the GCC PO by a GCC resident who is a registered agent.

The granted patents are published in the GCC Patent Gazette,²⁴⁵ and any person may file an action for invalidation within three months of such publication before the GCC Patent Grievances Committee. The patent owner should adequately exploit the patented invention within three years of it being granted in GCC member. If this is not achieved in the three years, the GCC PO may award a compulsory license if some criteria are met. The issued decisions of the GCC PO are subject to appeal before the Administrative Court in Riyadh. There continues to be some reluctance from industry to access the patent systems in the region, because of the high cost of securing a patent and the difficulty of enforcement of the rights. A United Arab Emirates court refused to enforce a GCC patent on the grounds that the necessary regulation to do so had not been issued locally. Also, the patent agent profession is not regulated by a professional body in the GCC. This has resulted in some difficulties for applicants with poor understanding of patent law and procedures. Likewise, there is a dearth of specialized judges and experts in the region to hear IPRs cases.

Some developments in the GCC

The patent grant procedure was streamlined in 2016 with the introduction of an online patent filing service which generated significant efficiency gains. The new procedure is built around a fully automated system developed in-house by the GCC PO. There is no legal obligation under the GCC patent regulation to provide the patent offices of the GCC member

States with the possibility to raise objections to the GCC PO's decisions on granting patents. In a decision dated 27 March 2019, it was decided that applicants may file a GCC Patent Application without submitting an Arabic translation of the specification, claims and abstract at the time of filing which effectively means that the application is examined on the basis of English specification, claims and abstract. However, an Arabic translation is required prior to the issuance of the patent as the GCC patent document is in Arabic. Supporting documents such as power of attorney, assignment and extract of the company registration may be simply signed, and further legalization can be completed locally in any of the GCC States by the patent attorney or agent.

In the United Arab Emirates, further to Ministerial Resolution number 137 of 2016, a specialized IP division has been set up at the federal level at the Abu Dhabi Court of First Instance, to handle IPRs disputes.²⁴⁶ Cases have been progressing to a court of first instance decision in approximately six months, which is half the time it used to take. Also, some of the decisions being issued have shown an increased awareness of and experience in dealing with complex IP issues. It is to be noted that the Dubai Department of Economic Development (DED) has implemented an online filing system for complaints regarding trademark counterfeiting. The system allows right holders to file online complaints and to upload United Arab Emirates registration certificates allowing the officials to voluntarily monitor the market for any counterfeit products.²⁴⁷

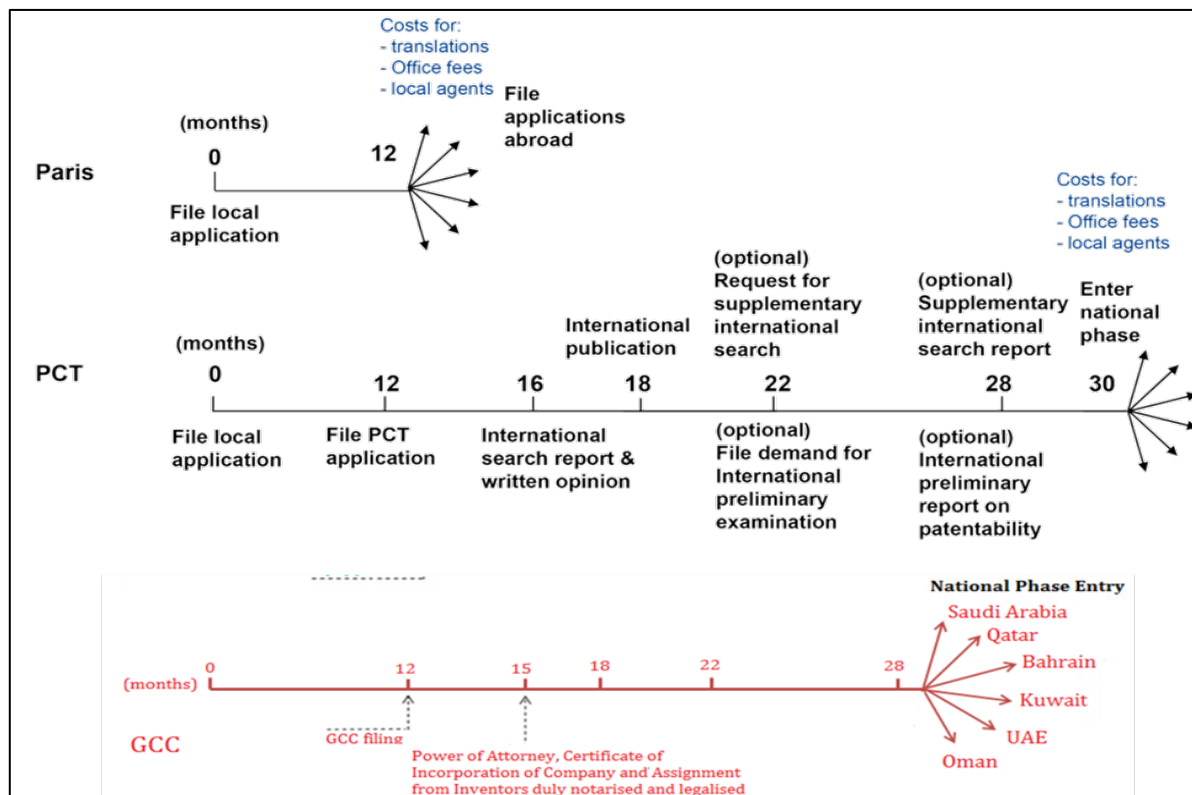
In April 2016, and as part of the country's efforts in advancing its IP procurement, the Qatari

Cabinet approved a draft decision of the Minister of Economy and Commerce on the establishment of a Grievances Committee regarding the decisions made by the Patent Office. The main Committee functions include enforcement and litigation pertaining to patent registrations and compulsory licenses. The director of the Patent Office is at the head of the committee and it has representatives from the Ministry of Economy and Commerce, Qatar Foundation for Education, Science and Community Development and the Qatar Chamber of Commerce.

The scope of the GCC patent regulation does not provide protection for the utility models or the so-called petty patents. Also, it is not fully compliant with the provisions of the international Patent Law Treaty and the PCT; some aspects are missing such as the publication of applications, the invalidation and the national treatment. Some proposals for amendments are raised to update the law as it is the oldest compared to the national patent laws in the GCC member States (figure 24).

The GCC PO has created an award to promote innovation and invention in line with Article 20 of Chapter IV on Scientific and Technical Research of the GCC States Economic Agreement of 2001.²⁴⁸ This article titled Intellectual Property, states that: "Member States shall develop programmes encouraging talented individuals and supporting innovation and invention; cooperate in the field of intellectual property and develop regulations and procedures ensuring protection of intellectual property rights; and coordinate their relevant policies towards other countries, regional blocs and international and regional organizations."²⁴⁹

Figure 24. Filing patents comparison: under Paris, PCT and GCC



Source: Drug Patent International, available at <http://drugpatentsint.blogspot.com/search?q=Filing+patents+comparison&x=0&y=0>.

B. Regional efforts on IP in the Arab region

The WIPO and the LAS have exerted huge efforts in capacity building and in raising awareness on IP at the regional level. Several of these efforts support gender equality and the empowerment of both men and women. Hereafter some of the activities that was held in the past few years:

The Regional Bureau for Arab Countries at the WIPO undertook many activities on gender mainstreaming and others in the Arab region:

- The Arab Regional Conference on Encouraging Women and Innovation, organized in collaboration with World Women Inventors and Entrepreneur Association (WWEA) and the LAS, 7-10 May 2017;
- One-day session on “Encouraging Innovation and Creativity of Women for Economic Development”, on the margins of the Eighth Regional Meeting of Directors of Industrial Property Offices, in Cairo, Egypt, on 12 April 2018, after which the Cairo Declaration was issued. Its sixth recommendation²⁵⁰ states the following: “Recognizing the important and

vital role of women inventors and creators in further developing the national economies, participants praised WIPO for its efforts of encouraging women inventors and creators; particularly through dedicating the theme of the 2018 World IP Day to 'Empowering Change: Women in Innovation and Creativity'. Participants also recalled with appreciation WIPO/LAS cooperation over 2017 in this area, and called for further enhancing Arab cooperation with WIPO in this area";

- Participation in the LAS celebrations of World IP Day under the theme "Empowering Change: Women in Innovation and Creativity", 23 and 24 April 2018;
- A special session on "Gender, IP and Economic Development", in the Arab Subregional Meeting on the role of Intellectual Property in Achieving Economic Development, Cairo, Egypt, 30 October – 1 November 2018;
- Regional Arab Meeting on Intellectual Property and Youth, Cairo, Egypt, 7 and 8 November 2018;
- WHO/WIPO/WTO Regional Workshop on Public Health, Intellectual Property and Trade, Kuwait City, Kuwait, 18-21 November 2018;
- Panel Discussion on "Intellectual Property and Women Entrepreneurs" in the National Workshop on Effective Intellectual Property Asset Management by Small- and Medium-Sized Enterprises (SMEs), Dubai, 19 and 20 March 2019;
- A "Regional Meeting on Intellectual Property and Women Entrepreneurship" hosted by the Hashemite Kingdom of Jordan, in cooperation with WIPO's diversity specialist and SME and Entrepreneurship Support Division, July 2019.

In 2012, the League of Arab States (LAS) adopted a resolution that makes a provision for the

creation of an IP and Competitiveness Department within the Economic Affairs Sector, following a memorandum of understanding signed two years earlier with WIPO.²⁵¹ The department has been very active since its creation in activities enhancing the IPRs protection, their enforcement, the harmonization of the respective legislations and in the awareness about IP in general. For example:

- In 2018, the memorandum of understanding between the LAS and the WIPO was amended and updated to be more inclusive of multiple domains in the IP field. Cooperation between the two organizations is being carried out on matters of common concern on various issues as well as the promotion of cooperation between countries, organizing and holding joint conferences and seminars related to IP and innovation;
- The department created a unified Arab mechanism that manages and conducts IP issues in the Arab region. With the WIPO, it holds periodic coordination meetings for government officials in the Arab countries;²⁵²
- The department has implemented a joint film project with the WIPO aiming to educate consumers on the negative effects of commercial fraud and counterfeiting in order to spread a culture of respect for IPRs. The screenplay was written by well-known writers from Egypt and the Egyptian actor Hany Ramzi participated;
- Every year the Department organizes the annual celebration of the World IP Day with the participation of selected experts in the field of IP, university professors, and many young inventors, innovators, lawyers and university students to spread awareness of IP on a large scale;
- Also, the department has published a "Directory of IP Offices in the Arab region", which contains data on government officials

of industrial property and copyright offices in the Arab countries, as well as a “Directory of the Arab Inventors and their Inventions”;

- Within the framework of promoting joint Arab action in the field of science and technology, and with the aim to develop an ethical framework that guides science and technology away from unethical practices, a Code of Ethics Project has been launched jointly by the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Lebanese National Council for Scientific Research, the Academy of Scientific Research and Technology of Egypt, the Royal Scientific Society of Jordan, the Pasteur Institute of Tunisia and a number of relevant regional bodies. IP protection is a central factor in this Code for protecting all the parties involved in the production and transfer of technology. The Code develops standards for the protection of authors and publishers of scientific research. The Thirtieth Arab Summit, held in March 2019 in Tunisia, issued Resolution No. 722 on 31 March 2019 approving the Code and guiding it and disseminating its principles to the research authorities in the Arab region.

In 2012, the Arab Center for Legal and Judicial Research of the LAS adopted the “Guiding Arab Law for IP Protection – Part One: Protection of Copyright and Related Rights.”²⁵³

C. SWOT Analysis

1. The objective

This SWOT analysis aims to provide policymakers and stakeholders who participate in the processes of generation and administration of IPRs in the Arab region with a tool to evaluate their IP systems and their

options to foster innovation with which to support the achievement of the SDGs. The findings will help inventors, research organizations, universities, entrepreneurs, MSMEs, start-ups and the administration to adopt a global albeit not inclusive, view of the IP system core values and underlying issues.

The SWAT analysis will illustrate the balance between the internal resources and hindrances regarding IP matters in the Arab region, and the external opportunities and risks. This should assist in long-term planning and highlight options and possible courses of action.

2. The methodology

Despite the difficulties faced, Arab countries have improved their IP systems and brought them closer to international standards. All the Arab States have IP laws, and most of them have established government authorities responsible for registration and administration of said rights, although in the majority of the countries the administration is not be centralized within one entity. Private institutions, universities and research centres play a dedicated role in the Arab region by raising awareness and helping in the creation and the enforcement of IPRs. International organizations such as the WIPO and the LAS are also making efforts to benefit of Arab countries to develop balanced and accessible international and regional IP systems. While safeguarding public interest, they try to reward creativity, stimulate innovation and contribute to the economic development.

This SWOT analysis is a situational analysis assessing the present status of IP in the Arab region. It is based on a desk review of the Arab countries’ laws and the information extracted from reports, studies, global indexes and

scientific articles available in hard copies and online. Results are compared with the best practices in developed countries and international organizations. It analyses many areas of IP systems including the inception phase of IPRs, their administration put in place, how they are enforced, the innovation ecosystem and the financing readiness of the creations of the mind in the Arab region.

The analysis is also based on the outcome of the “Expert Group Meeting on IP Systems in the Arab region” that was held at the ESCWA in Beirut in April 2019.²⁵⁴ Experts gathered and shared the status and challenges of IP in Egypt, Iraq, Jordan, Kuwait, Lebanon, Morocco, Oman, State of Palestine, Qatar, the Sudan, the Syrian Arab Republic, Tunisia, and from the Arab League Educational, Cultural and Scientific Organization (ALECSO), LAS, WIPO and ESCWA. They had the opportunity to share their respective countries and institutions views regarding IP. The main objective and a special focus were on discussing the strengths, weaknesses, opportunities and threats of the respective IP systems that could positively and negatively impact efficiency and effectiveness of the productive sectors and the future of IP systems in the Arab region.

One of the difficulties facing this SWOT analysis is the large number of Arab countries whose laws or procedures, challenges and opportunities differ. That is why in its four parts, the analysis is based on the most common challenges and opportunities. The most pressing challenge for all Arab countries that has influence over the development of IPRs at national level is the lack of an IP national plan that is part of an innovation strategy. The analysis is based on a comparison with the best practices worldwide and covers the state of IP system before the inception of IPRs, and

continues during their creation, commercialization and enforcement. It assesses the current status regarding the management and administration of the national IP offices in the Arab region, including the scope of their mandate, the vision and mission, the governance structure and organizational design, human resources and automation requirements; as well as the analysis of the IP laws and regulations in the Arab region and the innovation ecosystem readiness.

3. The analysis

(a) Strengths of IP and innovation in the Arab region

The IP laws of almost all the Arab countries are in compliance with the major international IP texts. Such a legal arsenal should help in fostering the successful start-ups ecosystem, which is nurtured by qualified human resources and funding opportunities in the Arab region.

(i) A successful start-ups ecosystem

Undergoing a period of great social, political and economic transformation, the region is a burgeoning hub of commercial innovation and entrepreneurship. The region’s rapidly increasing access to technology as well as its propensity for digital adoption and consumption is a powerful variable, interacting with the comparatively young population.²⁵⁵

There are many initiatives encouraging these efforts to integrate the most promising start-up entrepreneurs into a national and regional dialogue on pressing challenges.²⁵⁶ For instance the World Economic Forum and the Bahrain Economic Development Board (EDB) have selected the 100 most promising Arab start-ups of 2019 to participate in the official programme of

the upcoming World Economic Forum on the MENA region where they engage with industry and government leaders to discuss the future of their industries and how to add value to society.²⁵⁷

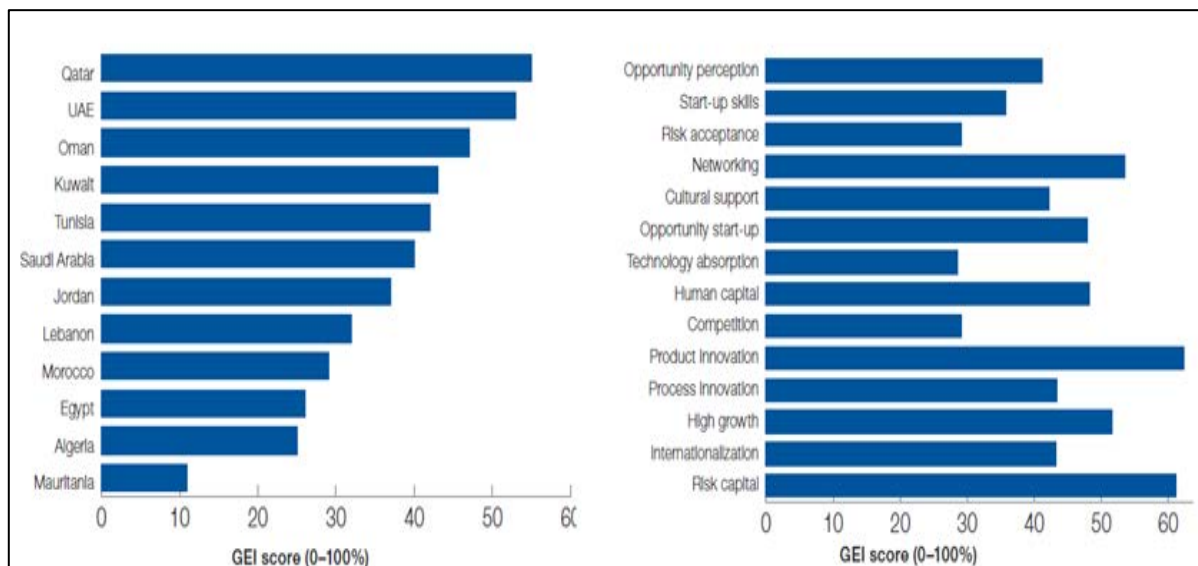
The technology industry in the Arab region is still rather new and therefore is not a male-dominated field. In the region, technology is viewed as a field in which anything is possible, including breaking gender norms, making it an attractive industry for women. Female entrepreneurs in the Arab region find new and creative ways to overcome barriers and enter the workforce and/or start their own businesses. Statistics show that one in three start-ups in the Arab region is founded or led by women, a percentage higher than in Silicon Valley where female businesses only comprise 17 per cent of the total.

STEM subjects include skills essential to managing fourth industrial revolution start-ups.

Several Arab countries are among the global leaders when looking at the percentage of female STEM graduates. According to UNESCO, 34 to 57 per cent of STEM graduates in Arab countries are women. This is higher than the percentages in the United States and Europe.²⁵⁸ Estimates provided by McKinsey suggests that increased workforce participation by women could add \$600 billion to the GDP of the region by 2025.²⁵⁹ Empowering Arab women to lead and innovate opens new channels for economic growth in new industry sectors. They are a force to be reckoned with on the start-up scene across the region.

The Global Entrepreneurship Index (GEI) average score for the region's countries in 2018 was 37 percent.²⁶⁰ Qatar, the United Arab Emirates and Oman are the top performers, while Algeria and Mauritania are at the bottom (figure 25).

Figure 25. The Global Entrepreneurship Index



Source: Global Entrepreneurship Index 2018, available at <https://thegei.org/global-entrepreneurship-and-development-index/>.

(ii) Qualified human resources with high level of creativity/innovation

Educational levels have increased across the Arab region. In the 1960s, educational achievement in the region was among the lowest in the world at an average of less than a year's education for adults 15 years and older. Between 1980 and 2000, the education of adults increased by over 150 per cent. This was a faster growth rate worldwide, regardless of region or income group.²⁶¹

The Global Talent Competitiveness Index of 2017 shows that the Global Knowledge index is high for countries like Lebanon (46th), Jordan (52nd), United Arab Emirates (54th), and Tunisia (55th).²⁶² As these countries attract corporations and foreign talent, they have the potential to become regional technology and start-up hubs.

(iii) Funding readiness

Start-up funding has been increasing, especially in the GCC economies. In the United Arab Emirates equity investments in new technology firms increased from \$100 million in 2014 to \$1.7 billion in 2016.²⁶³ The Arab Development Summit of January 20, 2019 welcomed the establishment of an investment fund in the fields of technology and digital economy with a capital and a value of \$200 million, which includes the participation of the private sector and contributions of \$50 million in capital from Kuwait and Qatar each. The Beirut Declaration that followed called on the Arab countries to support this initiative and to contribute to the common Arab economy by creating promising jobs for Arab youth and encouraging banks and Arab joint funding institutions contribute to

supporting this initiative in ways that provide it with the possibility of achieving its objectives.²⁶⁴

The venture capital investment ecosystem in the region is thriving. Incumbent venture capitalists have ramped up activity, while new venture capitalists have emerged from both within and outside the region. The total number of these types of investors grew from nine in 2008 to 145 by the end of 2016. Of these investors, a significant number include regional and international venture capitalists actively investing in the region, as well as accelerators, incubators and angel investors.²⁶⁵

In 2018 a new record was made regarding regional start-up funding when it increased by 31 per cent compared to 2017. Foreign investment remained stable in 2018 at 30 per cent. In the same year fintech became the top e-commerce industry with an 8 per cent increase in deals since 2017.²⁶⁶

(iv) IP laws compliant with major international principles

The Arab countries are all members of IP-related international conventions, although to different extents,²⁶⁷ and many of their statutes are in compliance with the TRIPS provisions. Some Arab countries, such as Egypt and Tunisia, even have IP-related clauses in their constitutions. In both constitutions the wording is succinct. The Egyptian Constitution stipulates that the "State shall protect all types of intellectual property in all fields" and the Tunisian Constitution provides that "intellectual property is guaranteed".²⁶⁸ In the United Arab Emirates, for instance, the protection of IP has been made a priority in recent years and most of the Arab countries

have reviewed and updated their IP laws to the international standards.²⁶⁹

(b) Weaknesses in IP and innovation in the Arab region

The absence of national IP strategies coupled with a weak management and enforcement systems of IPRs impacts negatively the innovation ecosystem in the Arab region. Moreover, the low expenditure rates on R&D and the lack of IPRs culture, education and awareness are main factors of weakness of the system.

(i) Absence of national IP strategies

Arab countries have taken significant steps to improve IP legal environment over the past ten years. Although national IP strategies are a necessity for the system to be efficient, they are absent from most of the Arab countries. Those who joined the WTO did so because they saw that such membership would give them the potential ability to exert some influence on international trade, whereas outside the WTO they would have no such ability. The WTO Arab member States respected the requisite IP legislative framework which was a key national political and economic strategy. Although these countries adopted IP laws as required by the developed countries, they appear unwilling, uncommitted or unable to act as expeditiously and as fully as required with an effective national implementation strategy and execution. Only a few of the Arab countries have a national IP strategy such as in Oman, but such strategies need to be constantly updated and enhanced to take into consideration the regional and international developments in the field of innovation and sustainable development. As for

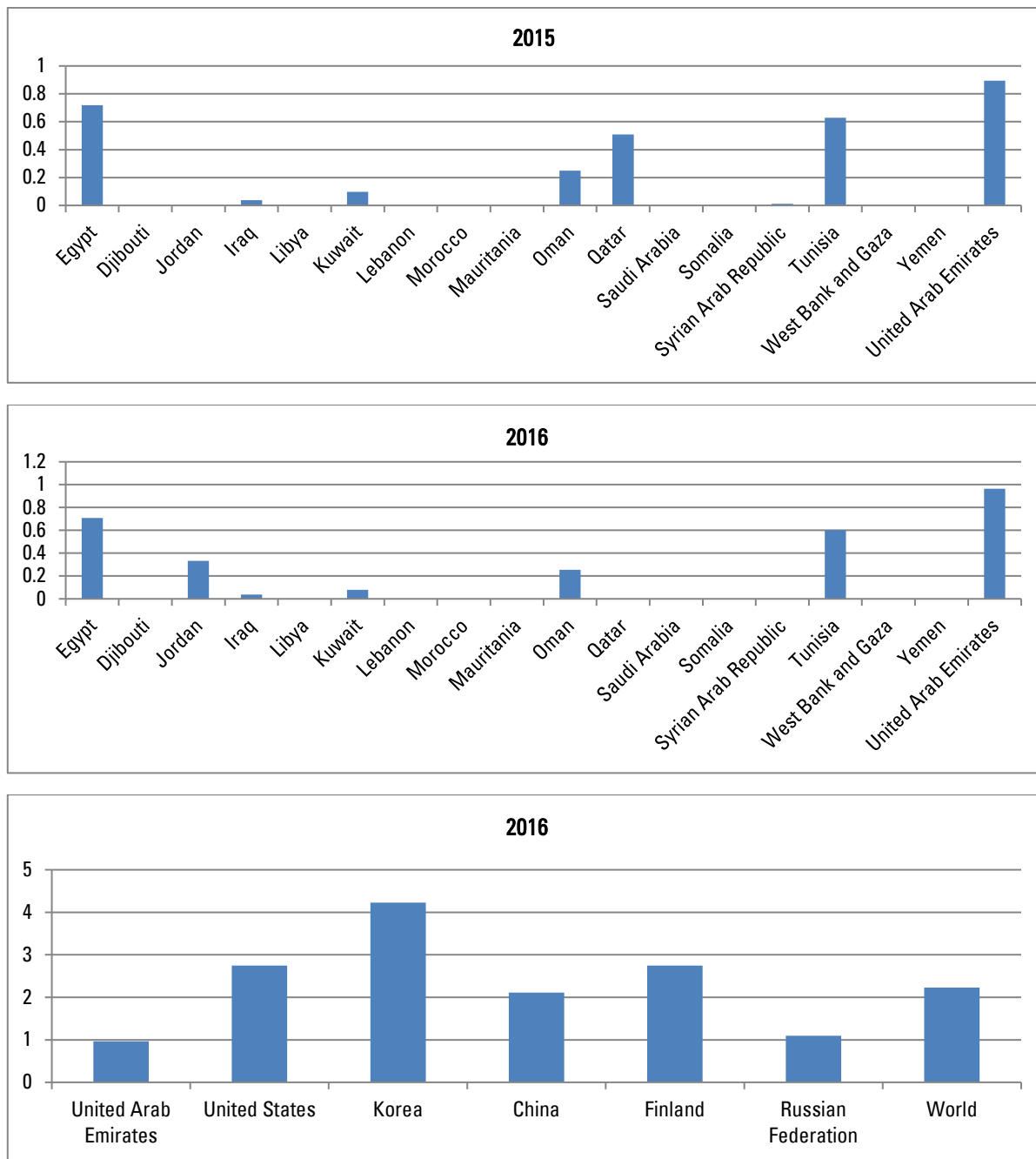
the other Arab countries who are not WTO members, most of them lack a national IP strategy which should be the main reference point that could be complemented by five-year plans that, for instance, set the objective of developing each Arab country into an innovative one and potentially pave the way to future accession to the WTO.

(ii) Weak management and enforcement of IPRs

According to a 2002 WIPO survey on counterfeiting and piracy,²⁷⁰ in many member States the main obstacles to eradicating counterfeiting and piracy are not due to the substance of the law, but in its weak management and enforcement, which is the case in most of the Arab countries. In many instances the ineffectiveness of enforcement systems is due to:

- legislation not being drafted effectively or extensively;
- a lack of human resources, funding and practical experience;
- insufficient knowledge among right holders and the public regarding their rights;
- insufficient training of enforcement officials, including the courts and judges; and
- systemic problems that come from inadequate national and international coordination, including a lack of transparency.

The participation of several ministries in IP management and enforcement is also recognized as a important cause for insufficient enforcement. The main problem that the ministries face is, like the judiciary, the lack of expert human resources and institutional capacity.

Figure 26. World Development Indicators

Source: World Bank, DataBank, available at <https://databank.worldbank.org/data/reports.aspx?source=2&series=GB.XPD.RSDV.GD.ZS>.

(iii) Low expenditures on R&D

Prior to the TRIPS Agreement, IPRs on trade such as patents, utility models, trademarks and industrial designs were overseen by the Paris Convention of 1883, revised in 1967. The Paris Convention was generous, leaving decisions on patent subject matter, terms of patent and the duration of protection to the concerned national governments. The field of invention showed some deviation with some countries protecting the final product, some protecting the process of manufacturing and some protecting neither.

Under the TRIPS–WTO administration, advantages go to those who invest in R&D and patent innovations. Firms with more innovations are better placed to introduce products in all WTO member States and have less fear of counterfeiting. It also offers a 20-year protection period, which guarantees that firms benefit from royalties, licensing fees and technology transfer fees, and they have the advantage benefiting from the return on large R&D investments.

The world average of R&D expenditures as percentage of GDP was 2.22 per cent in 2016. Korea had the highest R&D expenditures as percentage of GDP at 4.22 per cent followed by the United States and Finland at 2.74 per cent respectively. The Arab countries do not invest in R&D expenditure efficiently. From the scarce available data, the highest percentage of GDP expenditure on R&D scored in the Arab region was in the United Arab Emirates with 0.96 per cent.

(iv) Lack of IP awareness/culture: society/school/university

Although there was a joint awareness=raising campaign between WIPO and LAS aimed at informing consumers about the negative effects of commercial fraud and counterfeiting and to increase a culture of respect for IPRs, such an objective cannot be reached without implementing and spreading an IP culture. In the Arab region, teaching IP at school or at university is scarce, and consequently so is public awareness. Raising awareness has a critical importance regarding innovation and the enabling environment needed to stimulate innovation, including research and development, education, financing, partnerships, absorptive capacity and IPRs protection and enforcement. This is why without public awareness of the many keys that unlock the potential of innovation, including IPRs, innovation remains confined and its potential in the Arab region remains fettered and out of reach of those seeking to make a difference and to improve lives.²⁷¹

(c) Opportunities for IP and innovation in the Arab region

The IP ecosystem in the Arab region has plenty of opportunities and could thrive specifically with the political will for a transformation from oil-based to knowledge-based economies. Investments in technology transfer centred mainly on IPRs licensing and/or assignment could foster innovation and R&D. The large pan-Arab market could better compete with the other markets if the IP systems in different Arab

countries were harmonized. Such goals are set within national development plans and strategies of some Arab countries for the 5 or 10 years to come, whose completion would undoubtedly contribute in the achievement of the 2030 SDGs.

(i) Transformation from oil-based economy to knowledge-based economy and investing in innovation/technologies/R&D

The world is moving from an industrial age economy to an information age economy. The emergence of information and communication technologies have made economies dependant on knowledge and intellectual capital as main courses for development. The exploitation of knowledge in all ramifications and facets plays a vital role in wealth creation, and a more committed funding to R&D.²⁷² Some Arab countries, specifically the Arab Gulf States, are embarking on knowledge-based economic development. If applied efficiently, they could address the challenges created by the fluctuating oil and gas prices, economic diversification and the need to building up human capital and create jobs.

IP reduces threats and protects knowledge-based products, especially given that the trends of using Internet technologies to increase the unlawful sharing or using of IP protected material are on the rise. It is therefore necessary to include IP when working towards commercializing an innovative idea.²⁷³

Arab countries could formulate STI plans and implement IP strategies and programmes to improve the countries' diversified and sustained knowledge and innovation-based growth.²⁷⁴ Private sector investment in training and capacity building, R&D and innovation could be

encouraged. Additionally, better collaboration between universities, research centres and the private sector could be established.²⁷⁵

(ii) Signing of technology transfer agreements and fostering the innovation process

In the long run, technology transfer will contribute to economic growth and stability in the region. This is easily feasible, especially in the Arab Gulf States, with the availability of cheap and abundant energy resources, sufficient capital resources, state-of-the-art transportation and communications infrastructures, reliable industrial regulations and policies, and a great variety of incentives accessible to investors. In addition, WTO membership promotes and encourages technology transfer through the liberalization of international trade.

In general, strong and effective IPRs protection positively affects economic growth in the Arab countries, WTO members or not, by attracting foreign technology embodied in capital goods. The strong IP system and improvements in IPRs protection are beneficial, and foreign companies find sufficient incentives to invest in R&D and innovation, and in licensing the knowledge and collaborating with companies in the Arab region on common projects. This will result in greater inflows of technology transfer.

(iii) Harmonization of IP laws in the pan-Arab market

Arab countries should endeavour to standardize IP regimes, incorporating areas not included in TRIPS to avoid trade friction caused by disparities in national systems and to guarantee further world trade development. Innovative information and communication technology

development will create new challenges for IP protection.

Arab countries have the opportunity harmonize the IP protection and enforcement regimes in their respective systems and to also raise the standards of IP protection and enforcement, using the flexibilities permitted by the TRIPS.²⁷⁶ Although not all Arab countries are WTO members, they should seize IP benefits while guarding against introducing the challenges that even developed countries have been unable to solve. This is possible if a policy of counter-harmonization is pursued. Under such a policy a country can take advantage of current exceptions in international IP agreements and establish regional, local, and international practices that encourage innovative and flexible IP uses.²⁷⁷

Arab countries have enough experience to understand the strengths and weaknesses of different IP schemes as well as their own capability to adapt IPR to local and regional needs. Countries should use these experiences and guard innovative methods at international dispute resolution forums. The LAS could be of help to realize such integration and to achieve a fully functional Arab common market and increasing inter-Arab trade and integration.

(iv) Achieving the IP-related provisions included in the national development plans/strategies/visions over the next 5-10 years and achieving the 2030 SDGs

Many Arab countries have issued “vision” documents outlining their prioritization strategies in terms of how to achieve genuine diversification, enhance the capabilities and capacities of the private sector to lead overall economic growth.²⁷⁸ On the broad level, these documents can rally the population behind a

way forward and create a much-needed societal consensus about economic reform necessities. They do set targets even if these are not always specifically defined.²⁷⁹

(d) Threats for IP and innovation in the Arab region

(i) Political and economic unrest leading to brain drain

In the Arab region millions of young people have reached employment age. Many economies lose a lot in terms of human resources as the educated and connected younger generations want to emigrate in search of opportunities. The impact of this loss drains SMEs and entrepreneurship and negatively impacts innovation, enterprise development and the future ability of economies to convince young people to stay. When resources for a successful economic life are given to young people in their country, they are more likely to stay.

Arab intellectuals emigrate due to many reasons, such as the possibilities in technology and science and the lack of job opportunities in their own countries coupled with a fear of unemployment. In Arab countries with political turmoil and conflict, brain drain is a common occurrence. Also, innovative projects nurtured locally sometimes move abroad because of the lack of commercial channels and opportunities to grow.

(ii) TRIPS-Plus-like provisions applied to the detriment of local interests

The introduction of the principle of minimum standards under TRIPS significantly changed international IP management. This principle implies that any IP agreement negotiated after TRIPS, whether among or including WTO

members can only create higher norms, known as TRIPS-Plus. It indicates commitments beyond the “minimum standard principle” and differs greatly from the notion of flexibilities, which identifies the stipulations of the minimum protection standard as the “ceiling” of their commitments.²⁸⁰

TRIPS-Plus stipulations are used more and more in preferential trade agreements (PTAs), for example, in economic partnership agreements and free trade agreements. This type of clause is very diverse and can be used to achieve a variety of things in an agreement, such as refine, interpret and delimit a TRIPS’ flexibility, include stipulations beyond the minimum standard protection, add provisions on things not included in TRIPS, and stipulations that speak to commitments related to other treaties or international rules.²⁸¹

Some Arab countries could be “pushed” or “pulled” to implement TRIPS-Plus provisions

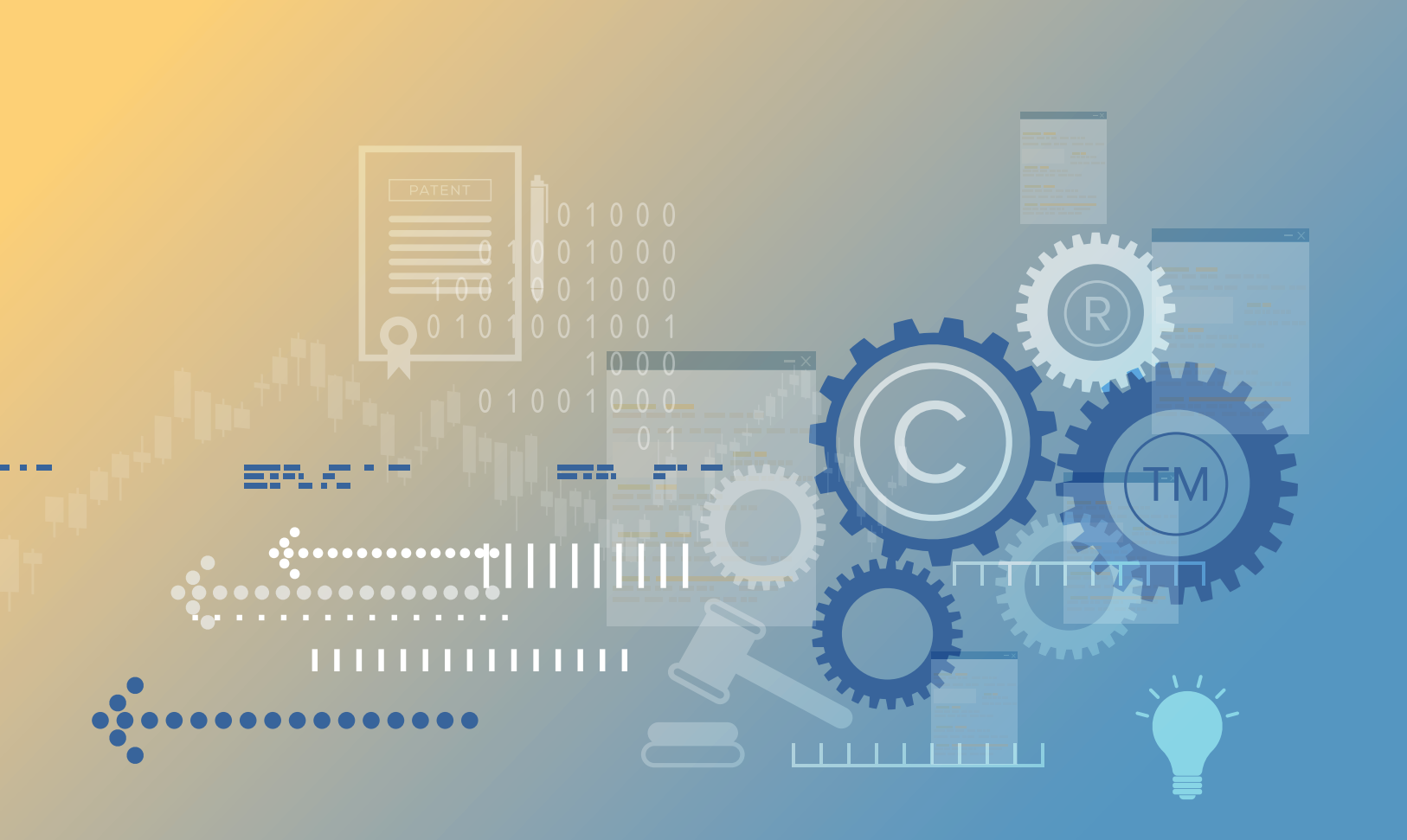
imbedded in some bilateral free trade agreements, although they are still not ready to effectively apply such provisions, to the detriment of local interests.

(iii) Not being able to meet all the international commitments

Arab countries have increasingly pursued international IP protection and committed themselves to protecting national IP. Although treaty memberships have increased in time, the degree of IP protection correlates with a country’s level of economic development. If a country is extremely disconnected from IP protection, it becomes difficult to agree to IP protection standards. The path that a country will follow regarding IP protection is closely linked to its economic development, with poorer countries less likely to engage in international IP protection as it is less likely to create IP protection to meet its international commitments in the future.

Table 11. SWOT diagram of the Arab region analysis

STRENGTHS	WEAKNESSES
<ol style="list-style-type: none"> 1. Successful technology start-ups ecosystem with a high proportion of start-ups founded or led by women. 2. Qualified human resources with high level of creativity/innovation. 3. Funding readiness from the government, business angels, venture capitalists or private sector. 4. IP laws compliant with major international principles. 	<ol style="list-style-type: none"> 1. Absence of national IP strategies. 2. Weak management and enforcement of IPRs. 3. Low expenditures on R&D. 4. Lack of IP awareness/culture: society/school/university. 5. The number of women applying to patent and copyright is still low.
OPPORTUNITIES	THREATS
<ol style="list-style-type: none"> 1. Transformation from oil-based economy to knowledge-based economy and investing in innovation/technologies/R&D. 2. Signing of technology transfer agreements and fostering the innovation process. 3. Harmonization of all or some of the IP laws in the pan-Arab market. 4. Achieving the IP-related provisions included in the national development plans/strategies/visions of many Arab countries for the 5 or 10 years to come and achieving the 2030 SDGs. 	<ol style="list-style-type: none"> 1. Political and economic unrest leading to a brain drain. 2. TRIPS-Plus-like provisions applied to the detriment of local interests. 3. Not being able to meet all the international commitments. 4. Innovative projects nurtured locally leak/move abroad because of the lack of commercial channels/opportunities to grow.



4. Addressing Specific Challenges of Intellectual Property Systems



4. Addressing Specific Challenges of Intellectual Property systems (based on Best Practices)

In developed economies, IPRs form an integral part of a national innovation ecosystem. Along with free trade and liberal capital accounts, they are beneficial for growth regardless of income levels. The competitive advantage in such knowledge-based economies is not centred on natural resources but on intangible assets which are capitalized through IPRs.

The main objective of this chapter is to show how Arab countries might address its main identified weakness in the IPRs (table 11) by showing some best practices from around the world. The best practices cover the period before the inception of IPRs and continue during their creation, commercialization, and enforcement. Specific practices based on some experiences will be summarized hereafter.

A. Initiatives for increasing awareness on IP issues

1. The World Intellectual Property Organization

WIPO works globally in collaboration with member States and public and private organizations, to cultivate a better

understanding of and regard for IP. It offers countless outreach tools freely available online,²⁸² in addition to its in numerous activities.²⁸³ WIPO assists its member States in the design of national IP strategies and the development of awareness-raising tools for youth.

Raising awareness is a vital element of any strategy and is necessary to build regard for IP. The approaches may include public communications and practical steps for public or private sector organizations. Tips provided by WIPO on awareness include changing education curricula, encouraging commercial strategies to better guarantee the lawful consumption of IP-protected goods, providing technical measures to block access to infringing content and initiating enforcement activities related to specific awareness campaigns.²⁸⁴

WIPO has developed a Consumer Survey Toolkit on Building Respect for IP (box 8). The toolkit is inclusive with survey templates that can be used to determine end user attitudes and behaviour.²⁸⁵ This toolkit is intended for use by public and private sector bodies wanting to measure consumer attitudes towards pirate and counterfeit goods.

Box 8. WIPO Consumer Survey Toolkit on building respect for IP

- Benchmark attitudes to piracy and counterfeit goods – changing attitudes can be tracked over time;
- Identify key trends in consumption of infringing goods and services to inform prioritization of resources for preventive measures;
- Evaluate strategies for Building Respect for IP;
- Assess media campaign effectiveness;
- Establish measures for inter-territorial comparison.

Sources: WIPO, 2017b.

2. The Canadian Intellectual Property Office (CIPO)

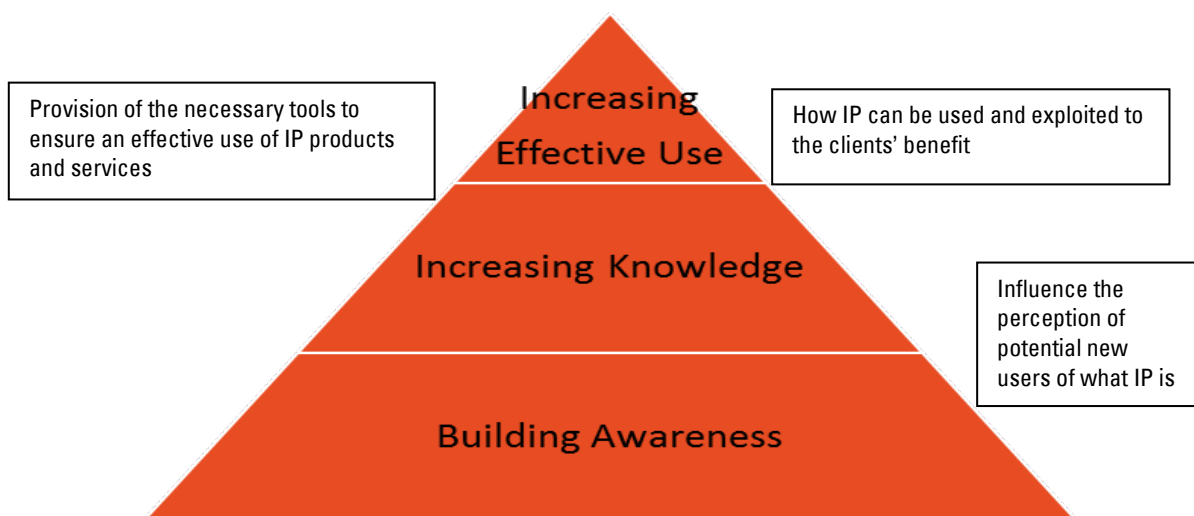
CIPO is responsible for the administration and processing of trademarks, patents, industrial designs and copyright. Its mandate is to deliver high quality and timely IP services to customers and to increase awareness, knowledge and

effective use of IP. CIPO created an outreach programme to help facilitate and encourage the attainment of IP rights and use of IP information. The programme focuses on raising the awareness of creators, innovators and Canada's business community on the value of IP.

In its 2002 strategy, CIPO acknowledged different target clients, including current clients that could use its services and products more strategically, SMEs, innovators and creators that with more knowledge on the use of IP will become CIPO members and/or users of its IP information and users IP information looking for advice such as: engineers, researchers, scientists, writers, musicians, designers, students and entrepreneurs.²⁸⁶

Depending on the level of IP knowledge, CIPO drew a pyramid showing which audience should be targeted at different learning stages with adapted messages and activity programmes (figure 27).

Figure 27. CIPO Outreach Programme Strategic Plan 2002-2006



Source: CIPO Outreach Program, Strategic Plan 2002-2006, available at https://www.wipo.int/export/sites/www/sme/en/best_practices/pdf/ca_outreach.pdf.

Box 9. IP awareness and use

- 10 per cent of Canadian SMEs hold formal IP rights;
- 9 per cent of innovative companies have an IP strategy;
- 83 per cent of Canadian SMEs indicated that IP was not relevant to their business when citing the reasons for not seeking IP rights.

SMEs that hold formal IP rights are four times more likely to export; 60 per cent more likely to be a high-growth SME; and 30 per cent more likely to seek financing.

Sources: Canadian Intellectual Property Office, 2017.

In its most recent strategy done in 2017,²⁸⁷ CIPO stated its goal was to ensure that businesses have a sound understanding of IP and can better utilize and leverage their IP assets as part of their business and growth strategies. It focuses on high-growth technology sector and SMEs, among others (box 9).

Many SMEs have low awareness of IP, which can inhibit business growth, scale-up and global competitiveness. Underutilized IP translates into potential lost business opportunities, while fully leveraged IPRs can open the door to new business partnerships – through its sale or licensing for example – creating new opportunities for growth and encouraging new investments.²⁸⁸

The CIPO is committed to deliver an enhanced IP awareness and education programmes such as:²⁸⁹

1. IP for Business: to deliver a suite of products and services designed to provide businesses

with the tools and information they need to better acquire, manage and leverage their IP assets.

2. IP Academy: to deliver a suite of seminars and training services for businesses, partners and intermediaries including those for markets and sectors.
3. IP Hub: to deliver and support a suite of networked services including referral, consultation and support to advisory services.
4. Focus efforts on innovation-focused communities/clusters to better support high-potential SMEs in key markets and sectors.
5. Strengthen networks and partnerships for the delivery of IP information, programmes and services.
6. Help CIPO's partners embed IP considerations into existing programmes and services for innovators and businesses.
7. Market CIPO's tools and services through multiple touch points using a variety of platforms to broaden CIPO's reach.

B. Initiatives for Boosting Women in Innovation

WIPO is working to level the playing field by encouraging and supporting more women to engage in innovation, creativity and use of the IP system. This is specifically important as women inventors account for 30.5 per cent of all international applications filed under WIPO's PCT, nearly double what it was in 2007.²⁹⁰

The WIPO has established a Policy on Gender Equality in 2014 which provides a general framework for how the Organization aims to

integrate a gender perspective in its policies and programmes²⁹¹. This was an important step in embedding gender into the fabric of the Organization, its programmes, activities and operating policies. It also provides for the establishment of gender focal points across the Organization. WIPO now has 25 gender focal points, covering key areas of IP including patents, copyright, trademarks, traditional knowledge and more. But in supporting gender equality, WIPO is undertaking an expanding range of activities and for women in raising awareness on the importance of gender equality, capacity building and leadership, which are central to changing perspectives on gender around the world.

1. Celebrating the achievements of women

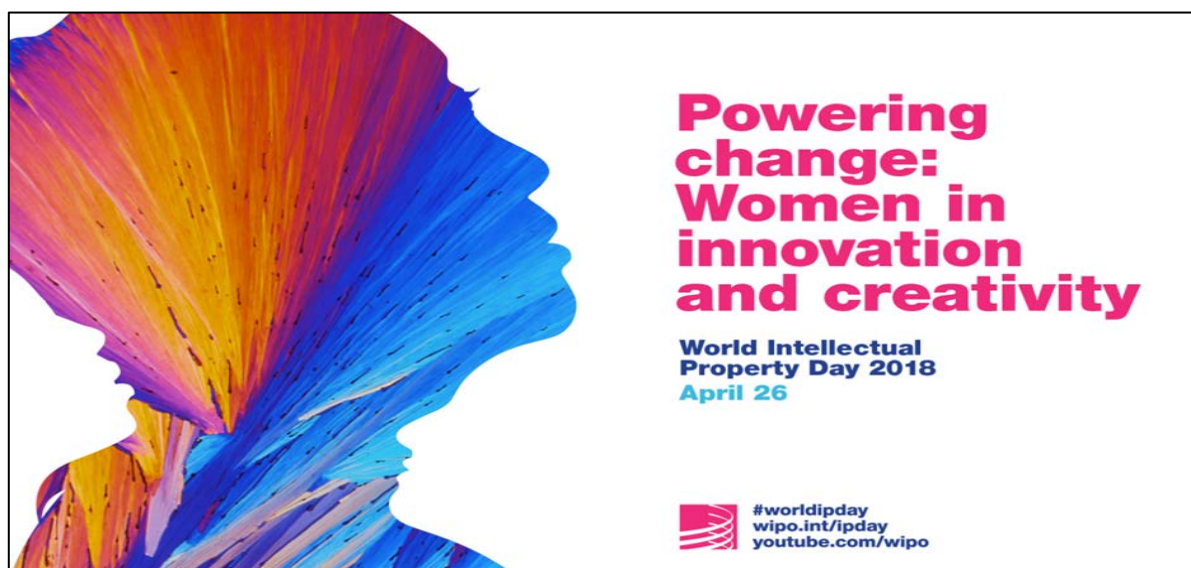
For the 2018 World Intellectual Property Day, the campaign, entitled “Powering change: Women in innovation and creativity” applauded the brilliance, resourcefulness and bravery of the women as change makers and shapers of the future.

2. Strengthening data gathering on the use of the IP system by women

The annual publication of flagship reports such as the World Intellectual Property Indicators and the PCT Yearly Review provide an up-to-date and reliable source of data on the gender dimension of international patenting activity. A potential shortcoming in this data gathering is that the index used assigns gender based on the first name of an applicant. Some first names are not gender-specific and can be used for both men or women. Also, unique names could present a problem if not recognized.

3. Empowering women through IP knowledge

Since 1998, the WIPO Academy has been empowering women through its range of IP training and capacity-building programmes, in particular in developing, least developed countries and transition economies. Of the estimated 50,000 students enrolled in the WIPO Academy’s distance learning programme every year, half are women.



Source: https://www.wipo.int/export/sites/www/ip-outreach/en/ipday/2018/ipday2018_bookmark.pdf.

4. Supporting the economic empowerment of rural women

WIPO supported more than 400 rural women in Taita Taveta County, Kenya, in securing a collective mark for their baskets and in developing a regional brand for their crafts. This has enabled them to negotiate better deals with brokers, scale up production, command higher prices for their wares and generally strengthen their livelihood opportunities.

5. Raising awareness about women, innovation and IP

Every year WIPO organizes a panel discussion on a gender-related topic on the side lines of the WIPO Assemblies meetings. This provides an opportunity to explore what can be done to foster greater diversity and inclusion in the development of innovation ecosystems.

6. Supporting women inventors and entrepreneurs

WIPO and its partners organize a forum and workshop annually in Seoul, Republic of Korea, as part of the Korea International Women's Invention Exposition, where women *inventors* from more than 20 countries are invited to showcase their inventions. The highest growth among women inventors was recorded in the Republic of Korea and China, where women featured in 46.6 per cent and 43.8 per cent of applications respectively.

C. Developing National IP strategy

After its evolution and spread, intellectual property disrupted the market and pressurized

organizations and countries around the world to use IPR strategically. Countries and organizations worldwide found it necessary to create specific strategies to facilitate the enforcement of IPR. The application of IPR requires distinctive measures to facilitate the development and creation of IP both at national and international levels. Some countries managed to create national strategies for IP, while others are facing difficulties. Among the Arab countries that have not formulated IP strategy so far, selected academic universities are adopting IP strategy to protect their intellectual property.

As stated by WIPO, “a national IP strategy strengthens a country’s ability to generate economically valuable IP assets. All countries have wealth in the form of human capital; literary and artistic works; crafts and folklore; and genetic and biological assets. An IP strategy helps nations unlock these assets in a planned, efficient, and sustainable manner”.²⁹² WIPO provides a methodology to develop national intellectual property strategies from concept to assessment. Such strategies support, facilitate, and foster the entire process of creation, development, administration and protection of IP at the national level.²⁹³ The IP strategy should be aligned with other national objectives, needs, and plans to maximize its benefits. It could be an integrated part of the Innovation Policy in a country and such integration will strengthen and foster innovation in the country.

In its mission to countries, WIPO follows several stages for developing national IP strategy:²⁹⁴

- **Assessment mission:** The purpose of this step is to prepare the ground for the

strategy development, identify, and train the national experts who will draft the strategy in addition to series of meetings with all stakeholders to work together to make this strategy successful;

- Establishment of national project team: The team of national experts, and could involve an international expert, will be responsible for drafting the strategy document and action plan and carry out an IP audit. This step ensures that high-level and experienced experts who have wide knowledge on the local context and needs will implement the entire process;
- Desk research: The purpose of this step is to review existing policies and ensure that the IP strategy will be aligned with other national objectives, strategies, policies, and other local needs;
- Data collection: Collect information based on a dedicated questionnaire, to present a comprehensive assessment on IP status in the country including weaknesses and strengths;
- National consultation: The purpose of this step is collaborating with all stakeholders and gain insights from them to validate the findings and participate in formulating the strategy;
- Drafting on the strategy: The project team will draft the strategy and action plan taking into account the consultation process outcomes such as useful recommendations and suggestions;
- Validation of the strategy: This step will be as a second round of consultations to validate the proposed strategy, considering consultations, before submitting the document to the government;
- Implementation: Implementation framework should be developed including a structure, resource mobilization strategy and monitoring and evaluation mechanisms.

As any national strategy, it is important to decide which agency will take the lead in the management and implementation of IP systems. Even though creating a national strategy is important but it is not enough to strengthen IPR in a country. Whether developed or developing countries, both must collaborate or cooperate with other countries or organizations to enhance and support their current regulations or legislations. The enforcement of the law is the toughest part and its failing leads to failure of a country's system. For this reason, organizations and governments tend to raise awareness in societies to urge individuals who lack knowledge about intellectual property to participate when they are allowed.

D. Mechanisms for the administration and enforcement of IPRs

1. Legal aspect

All IP laws must be continuously updated to comply with international conventions, mainly the TRIPS Agreement provisions, and to cover all the technological advancements. For instance, laws protecting databases must be standardized with international texts (box 10).

It is important to develop legal framework for IP creation incentives. These incentives might include:

- Providing fiscal incentives:
 - Tax breaks or waivers of sales tax or lower employment taxes: In Ireland, the tax relief is granted for profits earned on commercialized IP, whether from patents, designs, trademarks or copyright. The tax relief ceiling is the law's corporate tax rate of 10 per cent;

Box 10. The European response

In Europe copyright protection for the compilations of data is augmented with additional protection for databases. A database is defined in the European Union Database Directive as “a collection of independent works, data or other materials arranged in a systematic or methodical way and individually accessible by electronic or other means”. Protection extends to databases where there has been “qualitatively and/or quantitatively a substantial investment in either the obtaining, verification or presentation of the contents”, not if the database is original. Therefore, the European Union Database Directive may give protection to databases that do not meet the criteria for protection under copyright. Under the Directive protection for a database extends to its contents, because an infringement occurs when a significant part of the data in the database is extracted, whether qualitatively or quantitatively.

Sources: European Union, 1996.

- Tax deduction for R&D expenditure, if the eligibility criteria are met: In Singapore the deduction of tax is 400 per cent for the first SGD 400,000 spent on R&D annually, and a further 150 per cent for R&D spending above the given amount.²⁹⁵ In Australia, the tax deduction has two elements, namely, a refundable tax offset for specific authorised entities with an accumulated turnover of less than Aus\$20 million, and a non-refundable offset for all the other eligible entities;
- Tax exemption for technology transfer related income: In Malaysia, companies that provide R&D services based on a contract can get a 100 per cent tax exemption on income gained from research and development services rendered for 5 years;

Table 12. R&D tax deduction rates

Country	Deduction Rates
United Kingdom	225 per cent for SMEs, 130 per cent for large companies
Sri Lanka	200 per cent
Malaysia	200 per cent
Thailand	200 per cent
China	150 per cent
South Africa	150 per cent

- In some countries tax enticement policies for SMEs are targeted or the policies are more generous to SMEs. For example, an SMEs could benefit from higher tax deduction rates for R&D expenditure or it may be eligible for higher rate of tax credits (table 12).
- Speed up technology patents: Giving a higher priority to patents with good probability to deliver on public benefits, for example green technology or specific drugs, could assist with efficient resource use. Australia, Brazil, Canada, China, Korea, Japan, the United Kingdom and the United States all have Green Patent Fast Track programmes. Such measures act as incentives for innovators to explore areas of national priority;²⁹⁶
- Provide financial incentives: Such support is needed for companies to generate IP in the form of subsidies, seed money, grants, loans or equity participation. For example, SPRING, a Singaporean government agency that supports SMEs, has two funds namely the Start-up Enterprise Development Scheme (SEEDS) and the Business Angel Funds (BAF). The National Research Foundation of Singapore also has a programme that invests in early-stage venture capital funds.²⁹⁷

2. The intellectual property national offices

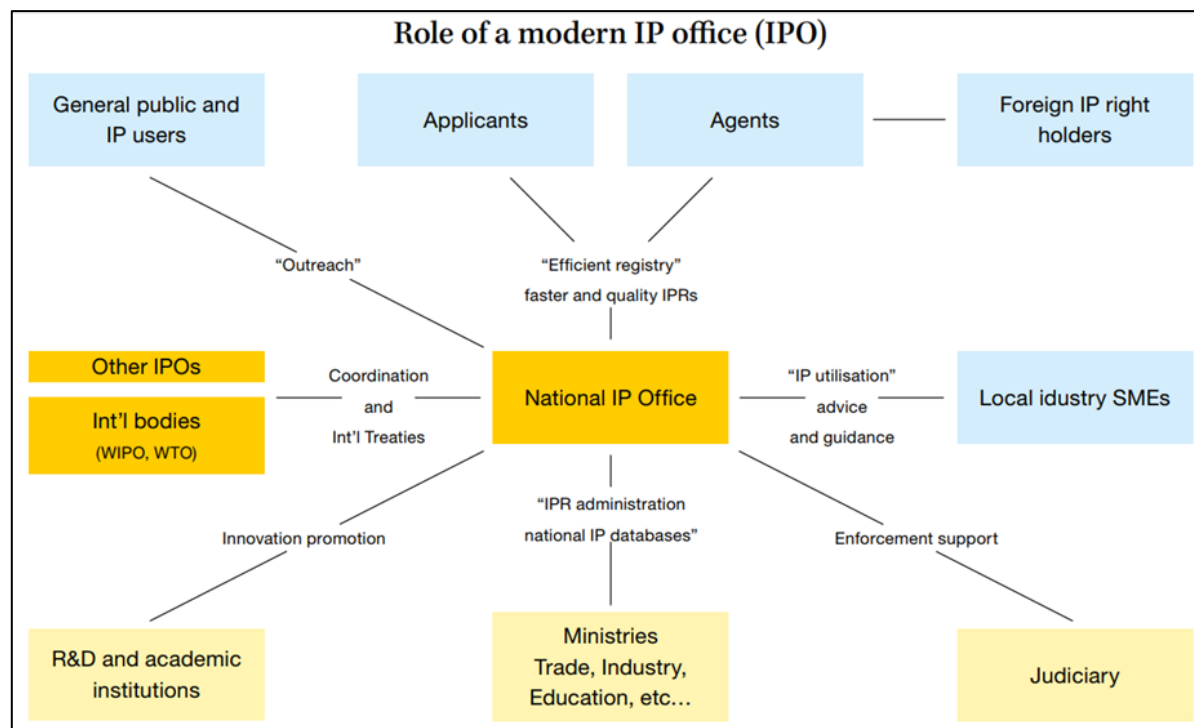
The first step in publicly managing IP is the registration of the rights before the IP Office. In 2016 WIPO published a toolkit to develop a national IP Strategy,²⁹⁸ proposing benchmark indicators to follow in order to strengthen IP administration and management. For example, the Korean Intellectual Property Office (KIPO) oversees the administration of patents, utility models, industrial designs, and trademarks. In this capacity it has the following tasks:

1. examines and registers IPRs for patents, utility models, trademarks, and industrial designs.
2. conducts hearings related to IP disputes.

3. manages and disseminates information on IPRs.
4. promotes public awareness on invention activities.
5. promotes international cooperation on IPRs; and
6. provides IPRs training to experts.

To deliver these services, KIPO manages a few other agencies, such as the Intellectual Property Court and the International Intellectual Property Institute. The functions of the IP office include IPR registration and protection, outreach services, promotion of innovation, making sure that practices comply with international treaties and agreements and supporting enforcement activities (figure 28).

Figure 28. Possible functions of a modern IP office



Source: WIPO, 2016.

Some IP offices only conduct formal examinations and delegate substantive examinations to other offices, including regional ones. In English-speaking African countries, for example, IP offices conduct formal and substantive examination of trademark applications. However, due to staffing problems and the small number of patent applications, only a few conduct substantive examinations themselves. The others use the services of the African Regional Intellectual Property Organization (ARIPO). Should the applications grow in number, countries may initiate their own substantive examination processes.

A major problem in many national IP offices is the unsatisfactory way of processing IP applications as a result of the legacy of manual systems. Most IP offices in developing countries address this challenge through business process automation. In 2001, WIPO launched a programme to provide countries with automation assistance in an effort to improve IP registration activities.

3. The technology transfer between universities and businesses

It is important that interaction and cooperation between universities, research centres, the administration, chambers of commerce, enterprises, venture capital funds or private investors are developed systematically. This will result in networks widely regarded as fostering innovative economies and societies. IPRs management is crucial in shaping innovative success in such national, regional and international knowledge networks.²⁹⁹

National Innovation Ecosystem initiative

In 2007 the Government of Finland established an IPR steering group to strengthen the country's National Innovation Ecosystem (NIE) in-line with the need to formulate a new national innovation strategy. The steering committee was given the responsibility to formulate a new national IP strategy that focus on SMEs. The members represented government administration and funding departments, entrepreneurs, industry, media, universities, IPRs management and businesses. Members were asked to identify a new approach to IPRs awareness, and their use based on national needs and development them based trends from the international arena.

Source: Mansala, 2008.

In fact, the successful economic development is a process where sequential upgrading and stages of development are observed. In the innovation-driven stage, the ability to produce innovative products and services using the most advanced methods is the dominant source of competitive advantage.³⁰⁰ Institutions and incentives supporting innovation are well developed, and companies compete with unique strategies that are often global in scope, and invest strongly in advanced skills, the latest technology and innovative capacity.

(a) The Canadian experience

Unlike other countries where there are laws governing the ownership of inventions made with public funding,³⁰¹ Canadian universities do not have uniform IP ownership and licensing policies. Some universities claim all ownership of IP developed by members of their

communities; others leave them in the hands of faculty and students or adopt a hybrid approach. Each ownership approach presents its own advantages and disadvantages: “inventor-owned” universities provide more direct incentives to faculty and students to get involved in technology transfer, but “institution-owned” universities may devote comparatively more resources to promote and commercialize academic IP.³⁰² Uniform IP licensing policies could facilitate technology transfer, and such policies would be better developed by various stakeholders.

(b) The United Kingdom solution

The United Kingdom “Lambert Toolkit” of 2005 provides an example of decision tools and standard agreements designed to improve collaboration between universities and the private sector. The tools include bilateral and multilateral research agreements models with accompanying guidance notes. The template agreements provide different approaches to determine which prospective partners would own and exploit IP resulting from research collaborations, and under which conditions. The Toolkit also includes a decision guide to help prospective partners select and tailor template agreements based on their circumstances.³⁰³ The Toolkit facilitates negotiation between potential collaborators, reduce the time and efforts required to secure agreement and provide example of best practices.

IP is not just about ownership; the usage is equally important. IP ownership is strongly affected by the development phase or Technology Readiness Level. There is an uneasiness between the university which wants to exploit its research to the maximum and the industry that wants to protect its commercial position.³⁰⁴

4. The MSMEs IP management

MSMEs are an indivisible factor of the innovative economy as most of the companies base their advancement on intellectual capital and innovations. It is therefore important to secure IPRs legally.

MSMEs could have an advantage in areas where there is rapid technological growth and disruptive technologies. Innovative MSMEs are every so often close to technological knowledge sources, for example universities and research centres. However, there are many internal and external elements that can impact on their IP management approaches. The effective creation or acquisition, protection, management, exploitation, licensing and commercialization of valuable IP assets, and their enforcement are cornerstones upon which today's successful businesses are built and developed.

MSMEs often display skills in a niche field, but they lack expertise in vital areas not a part of their main offerings. In such cases MSMEs can form partnerships to gain market access and sale channels for commercialization.³⁰⁵

Collaborative innovation is very important to MSMEs as it enables:

- Joining R&D with universities and/or research institutes. Such cooperation can bring about new commercial applications of research;
- Working with larger firms making it possible to use available of resources, skills, and technological solutions to create new solutions;
- Partnering with other MSMEs as to balance out the size advantages of larger firms and benefit from things such as cross-licensing patents and knowledge and expertise;

- In-licensing that helps MSMEs to get needed technology without in-house developing costs;
- Out-licenses that provides access to marketing channels, marketing skills, manufacturing expertise, and/or any other complementary strengths that are needed to bring about innovative products.

Apart from benefiting from R&D investments, innovative MSMEs registers patents for various strategic reasons, including cross-licensing trade with technology firms and, using patents as bartering chips in negotiations. A strong patent portfolio can help an innovative MSME attract partners, making it possible to get access to necessary funds and skills, specifically in areas of manufacturing and marketing.³⁰⁶

Patents make it possible for an MSME to benefit from an invention's value without having to manufacture anything. MSMEs are more likely to participate in licensing than larger firms.³⁰⁷ An MSME that wants to apply and register a patent should conduct a cost-benefit analysis, because in some situations the associated costs of obtaining and maintaining a patent, along with enforcement could be more than the potential value of the IPR. The value of the IPR lies in whether it affords a competitive advantage, influences competitors' behaviour or derives licensing or other revenues.³⁰⁸

As an alternative strategy, MSMEs can resort to trading secrets. These can be used to protect a lot of information for an unlimited time period. The most important thing is that the information remains confidential. It can be used to protect inventions that can't be patented, especially if they are in early stage development.

Trade secrets are less expensive the IPR to manage, but some investment is needed to keep

confidential information secret. For example, using non-disclosure agreements with employees and vendors or adding new security systems and facilities. Examples of the type of information protected by trade secrets include manufacturing processes, formulas and recipes, blueprints, +software source code and databases.

5. The enforcement of IPRs

Growth in IPRs grants and registrations every year results in more IP disputes. Both users and holders of IPRs need impartial court trials. These should be well-managed and be able to resolve disputes.

Although the TRIPS agreement itself does not oblige signatories to create separate IP courts, specialist IP jurisdictions are becoming an increasing focus worldwide. These specialized courts in IPRs matters are referred to by various names such as the Intellectual Property Session Court in Malaysia, the Thai Central Intellectual Property and International Trade Court in Thailand, the Intellectual Property Court in Portugal, the Intellectual Property Court of Singapore (a special commercial court under the High Court), the Patent Court in the United Kingdom, the Court for Intellectual Property Disputes in Russia, the Intellectual Property and International Trade Court in Thailand, and the Intellectual Property Tribunal of the Supreme People's Court of China, to name a few.

Intellectual Property Courts: one tool in the innovation policy toolbox.^a

^a "The establishment of specialized IP courts should not be viewed as a self-sufficient and free-standing policy instrument, but rather as *one* tool in the overall IP/innovation policy toolbox. It should consequently be complemented with policy instruments in order to promote creativity, foster innovation, and improve the quality of justice in IP disputes". de Werra and others, 2016, p. 39.

The newly created commercial courts and commercial divisions which can hear IP cases ensure that special attention is given to IP disputes with expert and effective adjudication, as well as fast dispute resolution.

In 2016 the ICC prepared a study that assists countries that are considering the creation or improvement of specialized IP courts. This could aid in boosting the effectiveness, expertise and knowledge of trials related to IP. Contributors from 24 developed and developing countries prepared the report. The report gives an overview of structures and trial procedures used by different jurisdictions in the world. Through the overview, countries can gain a better understanding of the current landscape and the way such courts function.³⁰⁹

In its conclusion the study found that specialized IP courts can benefit the current economic and legal environment that exist worldwide and especially in jurisdictions with adequate IP litigation. It was also found that such courts can improve the effectiveness of IP enforcement.

Some of the motivations and advantages to establish IP specialized Courts are:³¹⁰

- Enhancing more equitable decisions: the technology involved in IP cases, especially in the areas of biotechnology, cell biology and digital technologies, is complex. Specialized judges will certainly decide in a more equitable matter on such specific topics than unspecialized ones;³¹¹
- Developing IP expertise in specialized judges: specialized IP courts increase judicial exposure to IP laws by directing cases to a limited number of judges;

Sweden focused on centralizing and improving judicial expertise in IP, so that better quality decisions could be ensured.

- Providing capacities for the creation of special procedures that can enhance efficiency and accuracy. Some specialized IP courts, for example administrative courts, can guarantee that high-quality patents are granted. Recognized case law from IP court rulings is incorporated into the guidelines for examiners, to provide greater confidence that the IPR will be upheld in court. This reduces the risk of possible litigation later and makes it easier for SMEs to protect their IPRs without expensive court proceedings;
- Consistency and predictability of case outcomes: specialized IP courts help with to appoint judges with specialized knowledge on IP issues. This should provide higher quality opinions and a better consistency of law and unified court practice with respect to IP cases;
- Speeding up resolution of disputes: specialized IPR courts can make faster and more efficient decisions. Judges in specialized courts can better comprehend IPR case procedures and technicalities, because they are encouraged to obtain specialized knowledge on these issues. Specialist judges can also recognize patterns in cases and potential legal issues. This helps to reduce delays in dispute settling, ensuring quick resolutions;
- Improving overall climate of respect, protection and enforcement of IPRs: if the effectiveness and efficiency of judicial competence to resolve IPRs cases increases, it will increase confidence in IP litigation.

In 2014 the National People's Congress of China passed new legislation that sanctioned the creation of new IP courts. These specialized courts were created "...to promote and implement the national strategy of innovation-driven development, to further enhance the judicial protection of intellectual property, to safeguard, in practice and under the law, the lawful rights and interests of IP rights holders, and to defend social and public interests.^a

^a ICC, 2016, p. 9.

E. Proposal for IP system evaluation tool

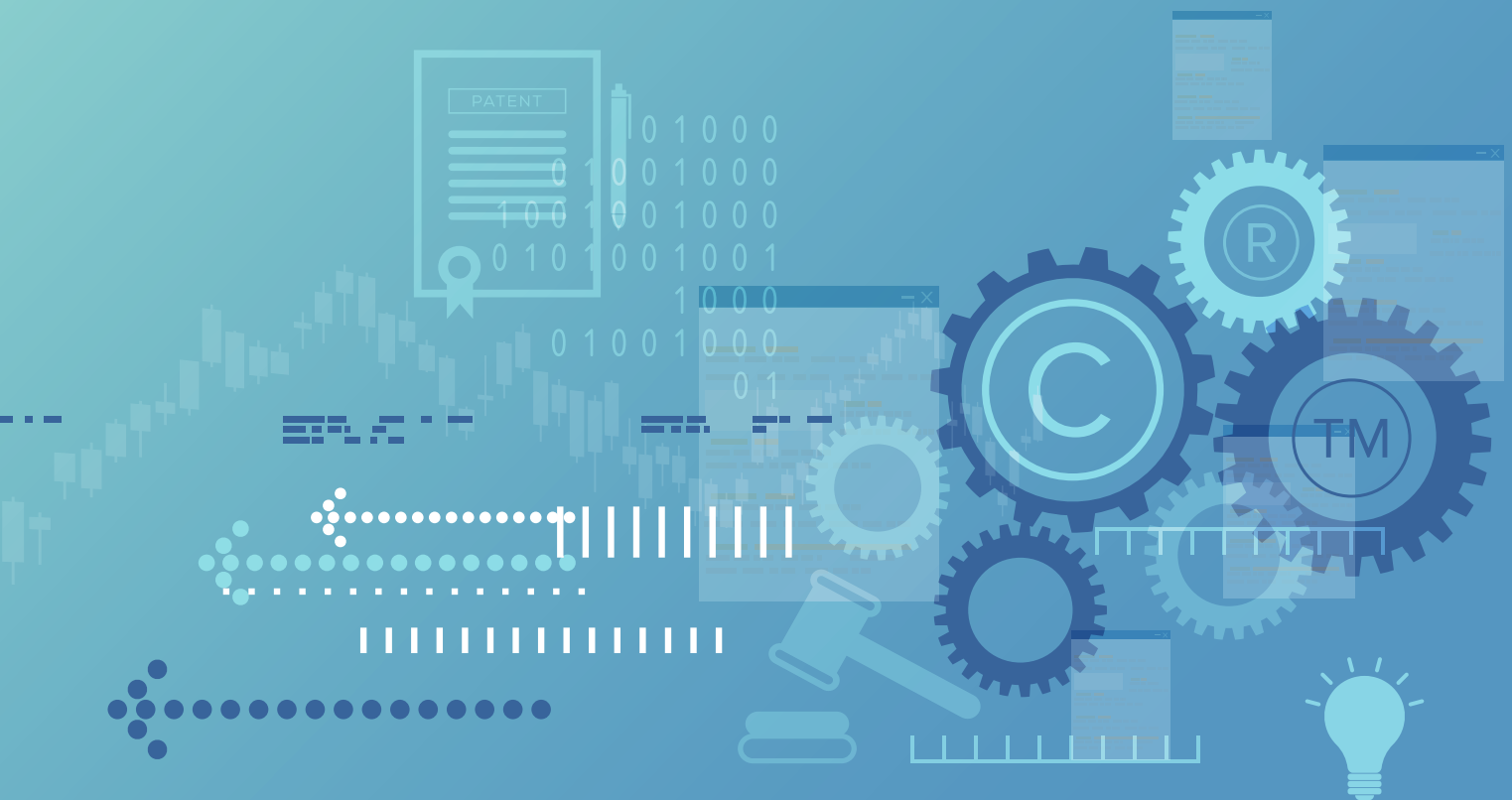
IP is not just about law; it is also about business and innovation. To evaluate the IP

system there should be a holistic view from the phase before the inception of the protected work, through its protection, and until its commercialization. These three phases contain many subcategories that could be used to help assessing the strengths or the weaknesses of an IP system by rating their respective elements.

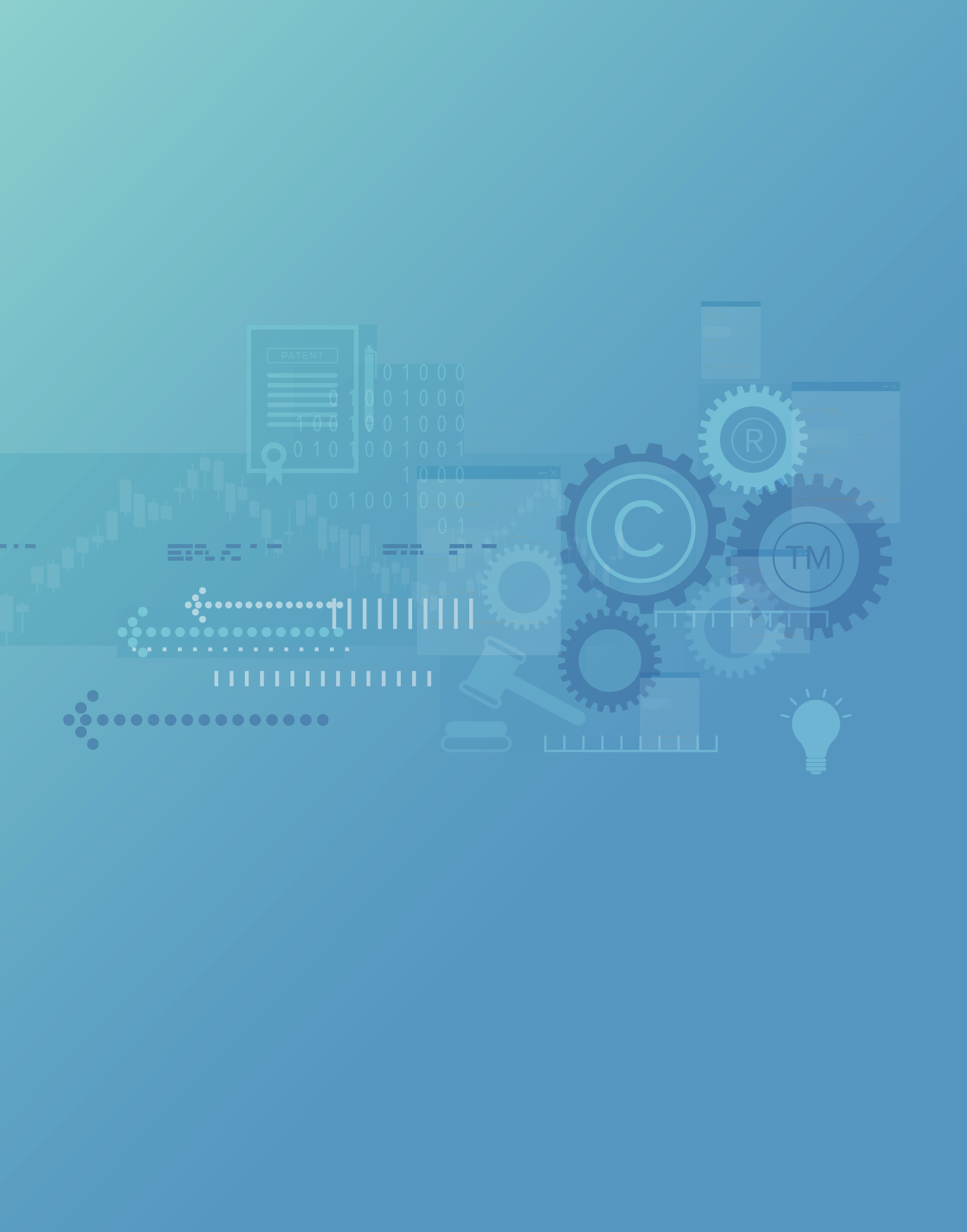
First Phase: The innovation ecosystem and the easiness of creation; Second Phase: Effectiveness of IPRs; Third phase: Usefulness for commercialization. Table 13 provides a summary of a proposed IP evaluation tool that help ESCWA member countries to evaluate their IP system.

Table 13. IP system evaluation matrix

Maximum Rating/20	Phases	Subcategories	Rating elements
1st Phase: 5/20	Ease of innovation and creation	<ul style="list-style-type: none"> IP culture/education/awareness: respecting the rights/knowing the basic details/being aware of the importance of IP for the economy; IP generation. 	(1 point/element) <ul style="list-style-type: none"> Human resources: the existence of the brains; IPRs education, trainings and outreach programmes; National innovation system and STI policy; Funding for R&D; IP policy.
2nd Phase: 10/20	Effectiveness of the IPRs	<ul style="list-style-type: none"> IP registration system; IP enforcement. 	(2 points/element) <ul style="list-style-type: none"> IP laws covering all the IP sectors and in compliance with international standards; Modern IPOs; IP professional services: specialized attorneys/agents; IP specialized tribunals/judges/chambers; Effective enforcement.
3rd Phase: 5/20	Usefulness for commercialization	<ul style="list-style-type: none"> The market for the product/service; Professional commercialization. 	(1 point/element) <ul style="list-style-type: none"> Business incubation; Science and technology parks; Technology transfer and licensing policies; Local and foreign markets for the product/service; Valuation of IPRs.



5. Conclusions and Recommendations



5. Conclusions and Recommendations

1. Conclusions

In today's global knowledge-driven economy where sustainable development is a key factor to achieve competitiveness, the IP in the Arab region is under exploited. The Arab countries have potential for growth and improvement, both on domestic and regional levels.

Intellectual property is essential for fostering and sustaining innovation cycle. It is also crucial for translating the results of research and development into commercialized products or services, including digital ones. As such, IP is important for achieving SDG 9 of the 2030 Agenda. IP boosts productivity and enhances competitiveness at national and international levels; it also improves industrialization, accelerates innovation and contributes to job creation. Serious efforts are needed to boost innovation, inventions, patents and copyrights in the Arab region as it is lagging compared to other regions in the world.

As stated in chapter 2, intellectual property is of high interest for public institutes as well for businesses. Although public institutes and non-profit entities are motivated by the public dissemination of research and knowledge rather than profits, IP solutions might address their challenges in securing fund for research or in disseminating the benefits of their findings through innovative mechanisms. Still, for public institutions the question remains as

to what kind of knowledge should be completely opened to public and which kind should be under IP law. The answer is mainly dependent on the context and the relative added value of the entity. A public entity might choose selected areas to be under IP where they have nationally or internationally added value and leave other areas of research completely open to public.

The debate over strict or lax IP protection, especially in developing countries, still exists and there is still no clear answer in developing nor developed countries. The dilemma for Arab countries is that if standards of IP protection are too strong, the costs of protection will outweigh the benefits, especially in Arab countries that may not have disseminated enough knowledge about the exploitation of IP. However, it is a fact that IP is essential for competitiveness and for attracting foreign direct investment. Moreover, it is instrumental for technology innovators and entrepreneurs.

Although the innovation ecosystem in the Arab region has been improving, the innovation performance indexes in most unfortunately lag behind other countries that do not have the same means and resources as the Arab countries. Several reasons are causing these gaps including the lack of IPRs creation, protection and enforcement, which is negatively influencing the innovation process. For example:

- IP systems do not evolve homogeneously: many of the Arab countries have not updated their IP-related laws, and only few have in place a national IP strategy;
- Some Arab countries are “pushed” to implement TRIPS-Plus provisions imbedded in some bilateral free trade agreements, although they are still not ready to effectively apply such provisions;
- Internal political discord has delayed the enactment of new laws and the ratification of conventions in general. Although Arab countries are members of important IP-related conventions, such as the Paris and Berne Conventions, not all of them have acceded to Madrid, the PCT or the WIPO Treaties;
- There are no unified texts that apply in all the Arab countries regarding IP, and the protection priorities diverge depending on the field of protection’s value for each economy;
- There is a low number of inventions and of IPRs registrations in regard to the proportion population compared to other regions of the world. This is caused partially by the brain drain of Arab inventors and entrepreneurs who move to places where they find better innovation ecosystems, incentives and easier, cheaper and effective enforcement. They usually register IPRs in Europe and in the United States with the belief they are more protected there;
- Universities, research organizations and even start-ups tend to register anything “new” they create, though this does not result necessarily in a commercial gain or contribute to the innovation process;
- The role, functions and structure of many of the IPOs do not meet the required standards to administer IPRs efficiently, due to:
 - Lack of financial resources: cannot perform their mandate such as awareness and outreach programmes, online registration service, and online databases;
 - Lack of human resources: administrative and/or qualified examiners are not enough or absent;
 - Lack of modern infrastructure and equipment;
 - Lack of linkages with SMEs, ministries, customs, judiciary, and R&D institutions;
 - Lack of linkages with other local, regional and international IPOs.
- The sporadic IP registration professions such as IP attorneys and agents: this leads to complications and weaknesses in the patent drafting documents;
- There are very few specialized IP tribunals or bodies competent to deal with prosecution and management of IPRs, and to judge on IP-related lawsuits.

2. Recommendations

Arab countries should enhance their research and development systems, formulate and adopt innovation and intellectual property policies and strategies to diversify and boost their economy. In this context, while furthering regional economic integration, Arab countries should identify their goals and draw up strategies for participating in the rapidly evolving innovation system in a manner that would ensure their ability to pursue human development objectives and achieve the SDGs. The private sector has an important role in innovation and economic growth. There is also an urgent need to encourage private sector investment in R&D in the Arab countries to and to play active role in the innovation ecosystem.

It should be noted that as part of the debate on the impact IPRs on innovation, IP laws remain an important legal construct that must take into

consideration the balance struck between the private and public interests. This means that IP as a stimulant to innovation is worthwhile when the producers of innovation and the economy in general benefit both from the spill over effect of innovation.

As stated in chapter 2, the solution to the dilemma of strong versus weak IP, would be for the Arab countries to keep the IP legislations strong and incentivizing innovation, but to find intrinsic and extrinsic alternatives to respect the public interest in accessing the information conveyed within that innovation. On the one hand, the rules from inside the IP statutes – intrinsic solutions – that could give freedom to benefit from a free access to the protected work, be it an invention, a copyrighted work, or an industrial design; and on the other hand, to work on limiting the scope of the IPRs through rules from statutes outside the IP laws – extrinsic solutions.

The intrinsic solutions in the copyright law would consist on reviewing the exceptions and limitations. Copyright grants a monopoly of exploitation to the creator, which goes against the freedom of trade and industry in liberal economies. The public interest is thus sought among the rules enacted to derogate from this monopoly. The exceptions on copyright are crucial and play this role. They enhance and motivate the creation, and they benefit the public from the information contained in the copyrighted work. Other ideas were elaborated in chapter 2, section D, of this report. Arab countries should renew the reflection around a solid but non-hegemonic IP system, which considers the different concerns of all parties, respecting their national public interest, and their international commitments.

Arab countries should also invest in human and information capital. IP is one of the factors which drives the economic growth through innovation that bolsters a sustainable development. This investment in knowledge should be made accessible to the business world. Creation of IPRs should be linked with the commercialization outcome, because innovation occurs when knowledge is transformed into capital.

An efficient IP system for innovation should be based on a solid legal framework, joint efforts between the private and the public sectors, and a link between the local agenda and the international agenda. It will thus promote technology cooperation through technology transfer enablement.

In developing strategies, plans and systems, it is essential that Arab countries places efforts on the inclusion of women. Therefore, in the planning and formulation stages countries should carefully consider the elements that may create barriers for women to participate in the IP system. This should include in-depth analysis of social, economic and cultural barriers that they may experience as well as considering elements that could lead to unconscious biases.

For enhancing the IP system in view of fostering innovation and competitiveness in the region, Arab countries and especially government, should ensure the following:

- **In the generation of IP:**
 - Teaching IP at schools and universities and performing awareness campaigns and competitions to encourage creativity and innovation. Attention should be paid to provide this type of education to girls,

- showcasing the advantages that IP can bring for a future in industry;
- Organizing specialized training programmes for researchers, innovators and public officers in charge of IP Offices, technology transfer offices or copyright offices. The training should focus on intellectual property, patent systems and copyright, and it should also be customized according to the needs of each target group and their level of involvement in IP system;
 - Instituting IP policy at universities, research organizations, incubators and accelerators;
 - Instituting science, technology and innovation policy at the national level;
 - Funding of R&D by government and by the private sector with incentives. In this area it is also important to provide education to potential funders on unconscious biases that could potentially act as barriers to women;
 - Offering IP information services facilitating the research for competitive intelligence purposes;
 - Providing fiscal incentives for creators and inventors, both men and women, under specific criteria;
 - organizing innovation and invention exhibitions for linking innovators with industrial sector.
- **In securing IPRs:**
 - Instituting modern IPOs respecting some automation standards to administer IPRs, with the financial and the human resources, and linkages with all the administrations that play a role in the IP system, and with regional and international IPOs;
 - Enacting updated IP laws taking into consideration the public interest of each Arab country, in compliance with the international obligations and regional cooperation agendas. In enacting the laws attention should be paid to elements that could potential negatively impact on the participation of women in the IP system.
 - **In enforcing the IPRs:**
 - Instituting IP-specialized courts at least at the trial court level;
 - Forming a group of lawyers in each Arab country on the drafting of patents to support and assist researchers and innovators in drafting their own patents;
 - Training judges, lawyers and security force on IP issues;
 - Defining mechanism for coordination and collaboration among various entities involved in IP, such as IP Offices, copyright offices and technology transfer offices;
 - for ensuring the sustainability of collaboration and coordination.
 - **In commercializing the IPRs:**
 - Implementing a strong industry – entrepreneurs – academia/R&D/MSMEs collaboration policy;
 - Clarifying the role of IP offices (IPOs) and technology transfer offices (TTO) in encouraging business community to use IP professionally so that they foster IP in a business-friendly manner;
 - Providing IP support services to SMEs, particularly those that are focusing on high technology and are export-oriented.
- These stages of acquiring, protecting and exploiting the intangible assets cannot enhance the innovation system if they are not included in an IP national strategy along with an innovation national strategy, in a way they complement each other in order to foster growth and sustainable development.

There are also several recommendations for strengthening regional collaboration in IP. Collaboration, coordination and exchange of best practices among Arab countries is crucial to enhance IP systems and promote innovation in Arab countries. Collaboration is also essential between the Arab region and other regions such as Latin America or Asia as they are also developing regions and have good practices in the domain of IP and innovation. Following some recommendations for strengthening regional collaboration:

- **Regional collaboration:**
 - Establishing regional database for inventions and patents for the benefits of the Arab countries and examining the feasibility of an Arab Patent Office;
 - Agreement on Arabic terminologies related to intellectual property in the Arab region to facilitate cooperation, coordination and exchange of experiences and success stories;
 - Inviting international organizations to maximize the benefit of services provided in the domain of IP and innovation, and to pursue their efforts and strengthen their collaboration to increase the benefits to the Arab countries;
 - Requesting regional and international organizations to prepare, for the Arab countries, analytical studies and best practices on research development and innovation (RDI); IP systems; digital copyrights and others.

Annex

Table A.1 Different IPRs: Description – Type – Field

Patents	Utility models	Trademarks	Copyright	Geographical indications	Industrial design rights	Plant variety protection	Trade secrets
Description							
Patents grant their owner a set of rights of exclusivity over an invention (a product or process that is new, involves an inventive step and is susceptible to industrial application), as defined by the "claims" (i.e. a clear and concise definition of what the patent legally protects).	Utility models provide a second-tier patent system, offering a cheap, no-examination protection regime for technical inventions (Suthersanen, 2006). Differently from patents, <i>inventive step</i> is not a requirement for receiving protection, while <i>novelty</i> is a requirement; that is, inventions need to be at a level above the "state of the art".	Trademarks provide exclusive rights of a sign, design or expression.	Copyright gives exclusive rights to authors for their artistic creations. In most countries it provides legal protection for software.	GI is a name or sign used on some products that correspond to a specific geographical location or origin.	Industrial design rights protect the visual design of objects including shape, configuration or composition of pattern or colour, or combination of pattern and colour	Plant variety protection (PVP) grants rights over new plants that are novel and distinct from available varieties, display homogeneity, and have stable traits in that the plant remains true to type after repeated cycles of propagation	Trade secrets protect knowledge that is not known to the public, which confers economic benefits to its owners and is subject to reasonable efforts to maintain its secrecy. It is a weaker right in that, if it is independently duplicated by others, they can use the information for their own economic benefit.
Type of IP							
Application required	Application required	Application required	No application required, that is, granted "sui generis"	Application required	Application required and in some cases granted "sui generis"	Application required	No application required, that is, granted "sui generis".
Fields/sectors							
For technological inventions	For technological inventions	Trademarks cover manufacturing industries and services including, consumer and agricultural products (such as wine and fruits)	Copyright covers creative industries including software sector (although protection is weak) & entertainment.	GIs are mostly applied to food products such as cheese, wine, and champagne; it also applies in some countries to handicrafts. ⁱⁱ	These rights cover sectors where non-technological design innovations are valuable, such as consumer products, architectural and engineering services, computer and telecommunications, fashion and crafts (UK IPO, 2013)	PVP covers plant breeder industries.	Trade secrets broadly cover manufacturing and services sectors. They can also protect innovations that are not well covered by other types of IP (such as different types of specific business models).

Rationales of IP for innovation

Patents	Utility models	Trademarks	Copyright	Geographical indications	Industrial design rights	Plant variety protection	Trade secrets
Relation to innovation and relevance for development							
Patents provide IP to inventions with industrial applicability , as opposed to inventions designed solely around theoretical concepts and ideas. <i>They, therefore, cover potential future innovations.</i> However, technically speaking patents are not equivalent to innovation, because patents provide IP for inventions and these may be implemented or not, resulting in innovations. Not all patented inventions reach the	Utility models follow patents in this respect. The only major differences are the lower degree of novelty and boundaries with the "state of the art". The latter has impacts on the extent to which innovation is supported. It can be useful in contexts of development (see Box 1.1).	Trademarks do not directly protect inventions, but can offer contributions to innovation if brand recognition, for example, creates incentives to upgrade the quality of services. Moreover, service firms in emerging countries often represent an important share of economic activities, even though some often have low levels of productivity and	Copyright can play an important role to the extent that it rewards novel creations. In relation to the development of ICTs, in particular, it provides more opportunities for the diffusion of creations and arguably greater business opportunities. It is likely of importance also for development contexts, albeit with potential enforcement challenges constituting a major hindrance.	To the extent that it provides brand recognition, GIs can encourage innovation to strengthen or develop product quality. They can provide larger rewards by strengthening community involvement via IP potentially supporting traditional sectors (see section 1.5).	Industrial design rights provide IP to design that is above "state of the art". They are particularly useful for non-technological innovations in consumer products. They are possibly quite relevant for emerging economies with an advantage in traditional activities (e.g. furniture and clothing).	PVP is relevant for ensuring quality and investments in its specific field. Its relevance is linked to the importance of such sectors in development contexts.	Trade secrets are relevant to the extent that they effectively protect innovative business practices for wider groups of innovators (Lemley, 2008). They are often quicker and cheaper, as no registration is required, and thus can be useful for development contexts, although this is conditional on enforcement.

IPRs incentives and access to finance

Patents	Utility models	Trademarks	Copyright	Geographical indications	Industrial design rights	Plant variety protection	Trade secrets
Incentives for inventions							
Yes, by providing ownership of future returns on successful innovations	Yes, by providing ownership rights for returns on incremental innovations and potentially serving as stepping stone for future patents	Yes, by providing ownership rights over brands associated with new products	Yes, by providing ownership rights of returns on novel creations.	Yes, by providing ownership rights for brands associated with quality improvements of protected products	Yes, by providing ownership rights of such non-technological innovations	Yes, by providing ownership rights over returns on novel plant varieties.	Yes, by providing ownership rights of returns on innovative business ideas and possibly also as incentives for the firm to perfect processes that might be eligible for future patent protection
Access to finance							
Yes, given ownership status and resolution of information asymmetries	Yes, given ownership status and resolution of information asymmetries, but less than for patents given the lower value	Yes, given ownership status	Yes, given ownership status, notably for software, movies and music	Yes, collective ownership of GI can facilitate access to finance for individual producers	Yes, given ownership status and resolution of information asymmetries	Yes, given ownership status and resolution of information asymmetries	Yes, given ownership status, but weaker protection status might lower opportunities

IPRs and Competitiveness

Patents	Utility models	Trademarks	Copyright	Geographical indications	Industrial design rights	Plant variety protection	Trade secrets
Access to knowledge and inventions							
Yes, disclosure requirement of patent applications provides access to knowledge, and licensing and/or selling of IP provides access to inventions	Yes, given disclosure requirement of utility model applications	Not fully, applications are awarded based on uniqueness alone, and trademarks are often used as alternatives to patents or utility models to avoid disclosure of information	Not fully, protection allows more public disclosure, except for software	Not fully, application rewarded for uniqueness	Yes, given disclosure particularly of registered design rights	Yes, given disclosure requirements of application	No, based on secrecy and often used as an alternative to other types of IP, notably patents, to obtain unlimited protection
International competitiveness and trade							
Yes, particularly for international patents (PCTs) or patents deposited in large markets (e.g. USPTO, EPO and JPO), but also constitutes a major asset abroad	Less relevant internationally, and mostly a tool for national, minor inventions	Yes, to the extent that international brands are a major asset on global markets.	Yes, particularly with regard to global digital and software industries	To a certain extent, given differential global recognition of GI	Yes.	Yes, it is critical for global players in the industry.	To a certain extent, as trade secrets are included in TRIPS and enjoy general legal protection in privacy and non-compete agreements, but enjoy only fragile protection, particularly abroad
Address information asymmetries regarding products							
Yes, patents can signal the quality of a company or invention and product novelty	To a certain extent, as a signal of quality of company	Yes, trademarks are a strong way of signalling product quality to consumers if competition authorities ensure no abuse	No	Yes, as a signal of product quality	No	Yes, signalling plant variety quality to users	To a certain extent, given the fragile nature of protection

Source: Compiled by ESCWA from

<https://www.innovationpolicyplatform.org/www.innovationpolicyplatform.org/content/rationales-ip-innovation/index.html>.

Table A.2 Arab Countries Populations and GDP

Arab Countries 2017-2018	Population	GDP per Capita (USD)
Algeria	41,318,142.0	3,940.0
Bahrain	1,492,584.0	21,150.0
Comoros	813,912.0	1,280.0
Djibouti	956,985.0	1,880.0
Egypt	97,553,151.0	3,010.0
Iraq	38,274,618.0	4,630.0
Jordan	9,702,353.0	3,980.0
Saudi Arabia	32,938,213.0	20,090.0
Kuwait	4,136,528.0	31,430.0
Lebanon	6,082,357.0	8,400.0
Libya	6,374,616.0	5,500.0
Mauritania	4,420,184.0	1,100.0
Morocco	35,739,580.0	2,860.0
Oman	4,636,262.0	14,440.0
State of Palestine	4,684,777.0	3,180.0
Qatar	2,639,211.0	60,510.0
Somalia	14,742,523.0	499.82
Sudan	40,533,330.0	2,380.0
Syrian Arab Republic	18,269,868.0	2,058.04
Tunisia	11,532,127.0	3,490.0
United Arab Emirates	9,400,145.0	39,130.0
Yemen	28,250,420.0	660.28
Arab region	414,491,886.0	6,137.0

Source: World Bank Data, available at <https://data.worldbank.org/region/arab-world>.

Table A.3 Arab Countries international treaties membership (least developed countries)

Country	Paris 1883	Berne 1886	PCT 1970	Madrid Agreement (TM) 1891 & Madrid Protocol 1989 (P)	WTO/TRIPS 1995	LDC ^x
Jordan	17 July 1972	Yes	9 June 2017	-	11 April 2000	No
United Arab Emirates	19 September 1996	Yes	10 March 1999	-	10 April 1996	No
Bahrain	29 October 1997	Yes	18 March 2007	15 December 2005 (P)	1 January 1995	No
Tunisia	7 July 1884	Yes	10 December 2001	16 October 2013 (P)	29 March 1995	No
Algeria	1 March 1966	Yes	8 March 2000	5 July 1972-31 October 2015 (P)	OBS	No
Comoros	3 April 2005	Yes	3 April 2005	-	OBS	Yes
The Syrian Arab Republic	1 September 1924	Yes	26 June 2003	5 August 2004 (P)	OBS	No
Djibouti	13 May 2002	Yes	23 September 2016	-	31 May 1995	Yes
The Sudan	16 April 1984	Yes	16 April 1984	16 May 1984-16 February 2010 (P)	OBS	Yes
Somalia	-	No	-	-	OBS	Yes
Iraq	24 January 1976	No	-	-	OBS	No
Oman	14 July 1999	Yes	26 October 2001	16 October 2007 (P)	9 November 2000	No
State of Palestine	-	No	-	-	-	No
Qatar	5 July 2000	Yes	3 August 2011	-	13 January 1996	No

Country	Paris 1883	Berne 1886	PCT 1970	Madrid Agreement (TM) 1891 & Madrid Protocol 1989 (P)	WTO/TRIPS 1995	LDC ^x
Kuwait	2 December 2014	Yes	9 September 2016	-	1 January 1995	No
Lebanon	1 September 1924	Yes	-	-	OBS	No
Libya	28 September 1976	Yes	15 September 2005	-	OBS	No
Egypt	1 July 1951	Yes	6 September 2003	1 July 1952-3 September 2009 (P)	30 June 1995	No
Morocco	30 July 1917	Yes	8 October 1999	30 July 1917-8 October 1999 (P)	1 January 1995	No
Saudi Arabia	11 March 2004	Yes	3 August 2013	-	11 December 2005	No
Mauritania	11 April 1965	Yes	13 April 1983	-	31 May 1995	Yes
Yemen	15 February 2007	Yes	-	-	26 June 2014	Yes

Source: WIPO Lex database, available at <https://wipo.lex.wipo.int/en/main/legislation>.

Table A.4 Arab Countries members to LAS, GCC. GATT

Country	LAS	GCC	GATT
Jordan	1945		
United Arab Emirates	1971	Yes	8 March 1994
Bahrain	1971	Yes	13 December 1993
Tunisia	1958		29 August 1990
Algeria	1962		
Comoros	1993		
The Syrian Arab Republic	1945		
Djibouti	1977		16 December 1994
Sudan	1956		
Somalia	1974		
Iraq	1945		
Oman	1971	Yes	
Palestine	1976		
Qatar	1971	Yes	7 April 1994
Kuwait	1961	Yes	3 May 1963
Lebanon	1945		
Libya	1953		
Egypt	1945		9 May 1970
Morocco	1958		17 June 1987
KSA	1945	Yes	
Mauritania	1973		30 September 1963
Yemen	1945		

Table A.5 Total number of granted patents in selected countriesLebanon³¹²

Patent Grants		
Year	Resident	Non-Resident
2008		
2009		
2010		
2011	53	252
2012	59	258
2013	75	250
2014	55	261
2015	85	194
2016		
2017		

Jordan

Patent Grants		
Year	Resident	Non-Resident
2008	10	11
2009	11	40
2010	12	52
2011	15	25
2012	3	45
2013	9	39
2014	15	100
2015	15	68
2016	4	117
2017	4	115

Egypt

Patent Grants		
Year	Resident	Non-Resident
2008	86	278
2009	56	265
2010	38	283
2011	61	422
2012	92	542
2013	86	379
2014	66	349
2015	91	381
2016	72	378
2017		

Morocco

Patent Grants		
Year	Resident	Non-Resident
2008	115	854
2009		
2010	5	803
2011	126	853
2012	112	867
2013	145	792
2014		
2015		
2016	109	243
2017	74	339

Saudi Arabia

Patent Grants		
Year	Resident	Non-Resident
2008		
2009		
2010	19	175
2011	17	235
2012		
2013	68	196
2014	77	512
2015	198	600
2016	183	471
2017	368	411

United Arab Emirates

Patent Grants		
Year	Resident	Non-Resident
2008		
2009		
2010		
2011	2	98
2012	1	39
2013	1	62
2014	3	110
2015	2	177
2016		
2017		

Germany

Patent Grants		
Year	Resident	Non-Resident
2008	26.137	4.669
2009	21.668	4.151
2010	22.183	4.048
2011	21.789	3.511
2012	21.485	3.168
2013	23.209	4.066
2014	23.714	4.396
2015	24.530	4.384
2016	29.522	4.860
2017	29.353	5.089

China

Patent Grants		
Year	Resident	Non-Resident
2008	46.590	47.116
2009	65.391	62.998
2010	79.767	55.343
2011	112.347	59.766
2012	143.808	73.297
2013	143.535	64.153
2014	162.680	70.548
2015	263.436	95.88
2016	302.136	102.072
2017	326.970	93.174

United States

Patent Grants		
Year	Resident	Non-Resident
2008	77.501	80.271
2009	82.382	84.967
2010	107.792	111.822
2011	108.626	115.879
2012	121.026	132.129
2013	133.593	144.242
2014	144.621	156.057
2015	140.969	157.438
2016	153.723	159.326
2017	150.949	167.880

Source: WIPO, Statistical Country Profiles, available at https://www.wipo.int/ipstats/en/statistics/country_profile/#1.

GCC Granted Patents

Year	Number of Granted Patent
2014	483
2015	662
2016	673
2017	2240
2018	2660
Till 28/3/2019	559

Source: Patent Office of Cooperation Council for the Arab States of the Gulf, "Annual Granted Patents". Available at <https://www.gccpo.org/Statistics/en/GrantedPatents.aspx>

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Endnotes

1. For the different types of IPRs, see annex, table 1.
2. Vaughan, 1996.
3. United States of America, Office of the United States Trade Representative, 2018.
4. Beltrametti, 2010; Jamar, 1992; Khoury, 2003; Khan, 2001.
5. E/ESCWA/TDD/2017/1.
6. See ESCWA Technology Centre Resources, available at <https://www.unescwa.org/sub-site/44121/resources>.
7. E/ESCWA/TDD/2019/TP.2.
8. See annex, table A.3.
9. Neighbouring rights (also called related rights) protects the legal rights of people and entities that contribute to making publicly available works under copyright or that produce subject matter that requires creativity, technical or organizational skills and thus warrant recognition. Traditionally it is granted to performances, producers of sound recordings and broadcasting institutions.
10. See annex, table A.3.
11. The law, repealed by Law No. 240 in 2000, was one of the oldest twentieth century IP laws in the region. It is to be noted that there was an Ottoman Law on Privileged Works of September 11, 1872. It was the first law to protect IP in Lebanon. Comoros had an older patent law dated July 5, 1844.
12. The Trademark and Patent Law of 1938 in Gaza Strip and the Patent Law No. 22 of 1953 in West Bank.
13. The 1949 law was repealed in Egypt by Law No. 82 of 2002.
14. Law No. 65 of 1970.
15. Law No. 58 of 1971.
16. 7 July 1884.
17. 30 July 1917.
18. 1 September 1924.
19. Jordan in 1972; the Sudan and the United Arab Emirates in 1974; Algeria, Egypt and Tunisia in 1975; Iraq, Qatar, Mauritania and Libya in 1976 and Yemen in 1979.
20. Saudi Arabia (1982); Somalia (1982); and Lebanon (1986).
21. WIPO, 1976. In March 1977, a Conference on Industrial Property and Transfer of Technology for Arab States was organized jointly by IDCAS, United Nations Industrial Organization (UNIDO), WIPO and the Government of Iraq in Baghdad.
22. The "Draft Model Copyright Law for Developing Countries", Documents DA/24/2 and 3, 1967.
23. WIPO (BIRPI) No. 805(E), 1967. Model Law for Developing Countries on Marks, Trade Names, and Acts of Unfair Competition.
24. WIPO No. 840, 1979. Model Law for Developing Countries on Inventions: Patents, Vol. I.
25. WIPO No. 841(E), 1980. Model Law for Developing Countries on Inventions: Know-How Examination and Registration of Contracts Inventors, Certificates Technovations Transfer of Technology Patents, Vol. II.
26. Price and Al Debasi, 2018, p. 41.
27. Saez, 2015.

28. Some developing countries proposed a revision of this model law in 2015. For more information see https://www.wipo.int/edocs/mdocs/scp/en/scp_22/scp_22_5.pdf.
29. Oman, Ministerial Regulation No. 219/1993, adopting the GCC Unified Patent Regulations as the Patents Law of Oman.
30. The regulation was amended by decision of the Supreme Council of the Cooperation Council for the Arab States of the Gulf in its twentieth session held in November 1999 and became effective on August 16, 2000.
31. GCC Unified Patent Regulations, September 1992, art. 15.
32. See Mohamadieh, 2006.
33. WTO observers Arab States: Algeria, Comoros, Iraq, Lebanon, Libya, Somalia, the Sudan and Syrian Arab Republic.
34. On 1 January 1948, GATT entered into force. The 23 founding members were: Australia, Belgium, Brazil, Burma, Canada, Ceylon, Chile, China, Cuba, Czechoslovakia, France, India, Lebanon, Luxembourg, Netherlands, New Zealand, Norway, Pakistan, Southern Rhodesia, Syrian Arab Republic, South Africa, United Kingdom and the United States.
35. Arab States membership to GATT: United Arab Emirates: 8 March 1994; Bahrain: 13 December 1993; Tunisia: 29 August 1990; Djibouti: 16 December 1994; Qatar: 7 April 1994; Kuwait: 3 May 1963; Egypt: 9 May 1970; Morocco: 17 June 1987; Mauritania: 30 September 1963.
36. Arab States members joined the WTO on the following dates: Jordan - 11 April 2000; Oman - 9 November 2000; Saudi Arabia - 1 December 2005; Yemen - 26 June 2014, United Arab Emirates - 10 April 1996; Qatar - 13 January 1996.
37. Maskus, 2002, pp. 135, 137-138.
38. See Harris, 2000.
39. Patent laws were enacted or amended: Morocco (1997), Jordan (1999), Kuwait (1999), Oman (2000), Tunisia (2000), Egypt (2002), United Arab Emirates (2002), Bahrain (2004), Saudi Arabia (2004) Qatar (2006), Djibouti (2009), and Yemen (2011).
40. See, for instance, the Communication from Egypt to the General Council, Committee on Trade and Development in 1998 regarding the Special and Differential Treatment for Developing Countries in the Multilateral Trading System (WT/GC/W/109) (WT/COMTD/W/49), p. 18. Available at <https://tinyurl.com/y2el9jpn>.
41. WIPO, "Statistical Country Profiles", available at www.wipo.int/ipstats/en/statistics/country_profile/#B.
42. Price and Al Debasi, 2018, p. 142.
43. See annex, table A.5.
44. Hoekman and Zarrouk, 2000.
45. Supervised and run by the Economic and Social Council (ESC), GAFTA relies on political institutions, such as the GCC and LAS. The contents of the agreement are substantial, as it provides for the elimination of tariffs and monetary, administrative and quantitative non-tariff obstacles. GAFTA members are Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, the State of Palestine, Qatar, Saudi Arabia, the Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen.
46. Morin, 2007, p. 47; Choudry, 2003; Drahos, 2005, p. 781.
47. GRAIN and SANFEC, 2001.
48. A typical IP clause reads as follows: "The Parties shall provide suitable and effective protection of intellectual, industrial and commercial property rights, in line with the highest international standards. This shall encompass effective means of enforcing such rights. Under the Agreement, the Parties agree that intellectual, industrial and commercial property comprises, in particular, copyright, including copyright in computer programs, and neighbouring rights, [database rights,] commercial trademarks and geographical descriptions including designation of origin, industrial designs and models, patents, configuration plans (topographies) of integrated circuits, protection of undisclosed information and protection against unfair competition in accordance with Article 10(a) of the Paris Convention for the Protection of Industrial Property [(1967 Stockholm Act) and the protection of confidential information concerning 'know-how']". Liberti, 2010.
49. One of the EU's objectives is to improve the protection and enforcement of IP rights in third countries, specifically through an effective enforcement regime, multilateral and bilateral agreements. See European Commission, <http://ec.europa.eu/trade/policy/accessing-markets/intellectual-property/>.
50. The FTA agreements cover all trade between the parties and allow them to go beyond WTO rules and requirements, offering stronger protection for investors and IPRs.
51. Drahos and Braithwaite, 2002, p. 194.
52. Dutfield and Suthersanen, 2008, p. 272.

53. For more on the SDGs, see <https://sustainabledevelopment.un.org/sdgs>.
54. For instance, the Convention on Biological Diversity, the Convention to Combat Desertification and the Montreal Protocol on Substances that Deplete the Ozone Layer.
55. Ezell, Atkinson and Wein, 2013, p. 59.
56. Mrad, 2017, p. 55.
57. E/ESCWA/TDD/2017/1.
58. See <https://www.weforum.org/agenda/2018/08/4-innovation-hotspots-in-the-arab-world/>. For a list of some initiatives in the Arab region see https://en.wikipedia.org/wiki/List_of_Arab_entrepreneurship_initiatives#References.
59. For instance, Smart ESA in Lebanon offers two types of legal coaching to all the start-ups, one general legal counsel and one specialized dedicated specifically to IP and new technologies matters.
60. Wyne, 2015.
61. Gordts, 2015.
62. Leaffer, 2010; Rogers, 1998, p. 5.
63. Brandt, 2002, p. 65.
64. Andreoni and Miola, 2016, p. 17.
65. World Economic Forum, 2018c, p. 23.
66. Available at <https://sustainabledevelopment.un.org/sdgs>.
67. Global indicator framework adopted in 2017 by the General Assembly (A/RES/71/313) and annual refinements contained in E/CN.3/2018/2.
68. Dixon, 2011.
69. Ibid.
70. A Guidebook for the Preparation of STI for SDGs Roadmaps, Fourth STI Forum, New York, 2019, p. 1. Available at https://sustainabledevelopment.un.org/content/documents/22724Guidebook_STI_for_SDG_Roadmaps_Draft_for_STI_Forum.pdf.
71. United Nations Conference on Trade and Development (UNCTAD), Transfer of Technology and Knowledge Sharing for Development Science, Technology and Innovation Issues for Developing Countries, CSSTI, 2014, p. 3. Available at https://unctad.org/en/PublicationsLibrary/dtlstict2013d8_en.pdf.
72. Cervantes, n.d.
73. Palfrey, 2011.
74. Cervantes, n.d.
75. See definition at <https://definitions.uslegal.com/i/incentive-to-disclose-theory/>.
76. Hamano, 2011.
77. Cervantes, n.d.
78. De Meeûs and Strowel, 2012, p. 184.
79. Referred to as the "Old Agenda". Yu, 2009, p. 467.
80. Dutfeld and Suthersanen, 2008, p. 273.
81. United Nations, 1964, p. 57.
82. Ladas, 1975, p. 174.
83. For instance, while developing countries believed the final document should be binding, developed countries contended that only a non-binding agreement would be acceptable. Sell, 1998.
84. On this see Dulume, 2019.
85. Sell, 2011, p. 20.
86. Helfer, 2004, p. 53.
87. United Nations, 2001.
88. Williams-Baron, Milli and Gault, 2018.
89. Heikkila, 2019.
90. WIPO, 2019c.

91. WIPO, 2019c.
92. Heikkila, 2019.
93. Burk, 2018; Ahmad and others, 2019.
94. Geiger, 2006, p. 405.
95. Filippetti and Archibugi, 2015; Awokuse and Yin, 2010.
96. Montanari, 2018.
97. Falvey and Foster, 2006; Yongmin and Puttitanun, 2005.
98. Dutfield and Suthersanen, 2005.
99. Chaturvedi, Rahman and Srinivas, 2019.
100. Dutfield and Suthersanen, 2005.
101. "Technological innovation may be classified in several ways: product vs. process, radical (basic or fundamental) vs. incremental (improvement), and disruptive vs. sustaining (sequential and/or complementary). Other important types of (non-technological) innovations that do not result from scientific and/or technological R&D, but are often crucial for profitably marketing the products and services resulting from the investment made in R&D are: marketing innovation, institutional innovation, and complementary innovation." Kalanje, 2005.
102. Among other indicators such as human capital and research, infrastructure, quality of universities, creative outputs, companies' R&D budgets, the activity of technology-intensive sectors, and others. See the Global Innovation Index (GII) 2019.
103. In the GI 2018, the United Arab Emirates ranked 38/126 and Yemen 126/126.
104. World Economic Forum (WEF), 2018a.
105. MAGNiTT, 2019, p. 7.
106. Ibid. In 2018, the industry still accounted for the second greatest number of deals, accounting for 11 per cent of all deals.
107. Badenhausen, 2018.
108. United States Supreme Court *Diamond v. Chakrabarty*, 447 U.S. 303.
109. The United States does not specifically exclude software or business approaches from patentable subject matter. The law simply states that to be patentable the subject matter must be a useful process, machine, manufacture or composition of matter.
110. On the patentability of digital creations and software see Miyamoto, 2016.
111. See European IP Helpdesk, Copyright or Patent – how to protect my software? Available at <http://www.iprhelpdesk.eu/node/2024>.
112. WIPO, 2015.
113. See "The Economic Performance of Copyright-Based Industries", available at <https://www.wipo.int/copyright/en/performance/>.
114. Jordan available at https://www.wipo.int/export/sites/www/copyright/en/performance/pdf/econ_contribution_cr_jo.pdf; Lebanon available at https://www.wipo.int/export/sites/www/copyright/en/performance/pdf/econ_contribution_cr_lb.pdf.
115. OECD, 2015.
116. See WIPO Internet Treaties, available at https://www.wipo.int/copyright/en/activities/internet_treaties.html.
117. Arab countries not members to the Berne Convention are Iraq, State of Palestine and Somalia.
118. For the Berne Convention see https://www.wipo.int/treaties/en/ip/berne/summary_berne.html.
119. On limitations and exceptions, see <https://www.wipo.int/copyright/en/limitations/>.
120. Sony Corp. of America v. Universal City Studios, Inc., 464 U.S. 417 (1984).
121. Khoury, 2007.
122. A.V. v. iParadigms, LLC, 562 F.3d 630, 637-45 (4th Cir. 2009).
123. Translation: "An exception is of the strictest application".
124. Carey, 1853, p. 70.
125. Arrow, 1962.
126. Ibid.
127. Friedman, Landes and Posner, 1991.
128. Bessen and Maskin, 2009.

129. Arrow, 1962.
130. Lanjouw and Schankerman, 2003.
131. Mention and others, 2016.
132. Egypt Vision 2030. Available at <http://www.cabinet.gov.eg/English/GovernmentStrategy/Pages/Egypt%E2%80%99sVision2030.aspx>.
133. Article 69 endorses the State's obligation to protect all types of IPRs in all fields. It further determines that a body should be established that focuses on protecting IPRs. Available at <http://www.sis.gov.eg/Newvvr/Dustor-en001.pdf>.
134. Abdel-Latif, 2014.
135. For more information about national technology transfer system in Egypt, see E/ESCWA/SDPD/2017/CP.4.
136. The four "books" of the law address patents, integrated circuit designs, undisclosed information, trademarks, geographical indications, trade statements, industrial designs, copyright and related rights and plant variety protection.
137. The previous law determined that the Industrial Designs Office did not have the legal authority to refuse the registration of any application. Therefore, some applications were registered although legally deficient.
138. The Higher Administrative Court ruled that the TRIPS Agreement is not self-executing and its simple publication in the Official Gazette is not sufficient for its use. It ruled further that to make use of the TRIPS Agreement, a national law that includes its stipulations must be issued. Appeal No. 6965, 49 L, SAC, 25/12/2004. El-Saghir, 2017, p. 8.
139. The WIPO website contains a complete list of WIPO-administered treaties that Egypt is a contracting party to. Available at <https://wipolex.wipo.int/en/legislation/profile/EG>.
140. Agreement for scientific and technological cooperation between the European Community and the Arab Republic of Egypt. Available at [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22005A0713\(01\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22005A0713(01)&from=EN).
141. See "EU-Egypt PRIMMA signature and JSTCC", 27 October 2017. Available at <https://ec.europa.eu/research/iscp/index.cfm?pg=egypt>.
142. It was established in 1951 by Law 132 of 1951 and has been related to the Academy of Scientific Research and Technology since 1971. See www.egypo.gov.eg.
143. Starting effectively from April 2013.
144. Available in Arabic at http://www.egypo.gov.eg/how_apply/Manulal_forms_infoAplication_inventions_a1.pdf.
145. See EGPO's annual reports. Available at <http://www.egypo.gov.eg/page.aspx?id=17>.
146. In 2018, the infrastructure of the IT department was renovated. The whole network was replaced improving speed and efficiency of work for all departments. In the technical examination department, every technical examiner is equipped with a workstation consisting of a computer with 2 monitors and has access to the internet. Technical examiners have access to various technology specific databases covering patent and non-patent literature, and to commercial databases such as STN® and Reaxys®. EGPO has updated almost all the workstations in the office, and it performs a regular maintenance for the existing workstations. About 30 new workstations were introduced.
147. The law became effective on October 1, 2008.
148. For instance, the Cairo University IP Policy which is available at https://documents.aucegypt.edu/docs/about_Policies/IntellectualPropertyPolicy2014.pdf.
149. Zouag and Kadiri, 2014, p. 234.
150. Bond, and others, 2012, p. 55.
151. See <http://www.asrt.sci.eg/ar/index.php/grants/кта>.
152. Egyptian Center for the Advancement of Science, Technology and Innovation (ECASTI), 2014. For a detailed list see Egypt, Ministry of Higher Education And Scientific Research, List of Egyptian Public, Private Universities and Egyptian Research Institutes. Available at <https://healthresearchweb.org/?action=download&file=UniversitiesInstitutionsList.pdf>.
153. This ranking is calculated as an average based on answers to the question, "to what extent do business and universities collaborate on research and development (R&D) in your country?" Egypt ranked 106 out of 126 in this indicator in 2018.
154. El-Din, Kash and Fahmy, 2012.
155. For a list of TICs in Egypt, see https://www.wipo.int/tisc/en/search/search_result.jsp?country_code=EG.
156. Available at https://documents.aucegypt.edu/docs/about_Policies/IntellectualPropertyPolicy2014.pdf.

157. They renewed their commitment to the implementation of the decisions and projects that were adopted by the previous Arab Development Summits in Kuwait on January 19-20, 2009; in Sharm al-Sheikh on January 19, 2011; and in Riyadh on January 21-22, 2013.
158. For more information about national technology transfer system in Lebanon, you can refer to E/ESCWA/SDPD/2017/CP.2.
159. Lebanon, 2018, p. 1.
160. A report commissioned by the Ministry of Economy and Trade in late 2017 and conducted by McKinsey. See Lebanon, 2019.
161. The Ministry of Economy website lists other IPRs related resolutions and decrees in Lebanon. Available at <https://www.economy.gov.lb/en/services/intellectual-property-right/legislation>.
162. Law issued by resolution No. 2385/LR of January 17, 1924.
163. Repealing articles 137 to 180 of Law No. 2385 of 1924, and articles 722 to 729 of the Penal Code.
164. Repealing articles 1 to 46 and article 99 to 104 of Law No. 2385 of 1924, and articles 707, 708 and 709 of the Penal Code.
165. For a list of treaties, see <https://www.wipo.int/treaties/en/>.
166. The IPPO was instituted by Law No. 538 of 1996, replacing the IP unit that was instituted by Law 2385 of 1924.
167. Law No. 35 of 2008 organizing the Ministry of Culture.
168. Counterfeit products generally fall in the following categories: alcoholic beverages, cosmetics, apparel, fashion accessories, luxury consumer goods, CDs/DVDs, books, satellite cable distribution, vehicle spare parts, and pharmaceuticals.
169. From 2011 to 2017 a total of 2,044 patents have been registered for 41,198 TMs and 1,767 copyrighted works.
170. Beirut Research and Innovation Centre, 2016, p.84.
171. For an overview of CNRS, see <http://www.cnrs.edu.lb/english/about/the-cnrs-overview>.
172. Several experts from the Lebanese University, the American University of Beirut, Saint Joseph University, the Lebanese American University, the Lebanese International University, the Holy Spirit University of Kaslik, the Balamand University, the Islamic University in Lebanon, Notre Dame University-Louaize and the Institute for Scientific Research in Agriculture have contributed to discussions of the present document. Available at http://www.cnrs.edu.lb/Library/Files/Uploaded%20Files/Charter_of_Ethics_En.pdf.
173. American University of Beirut, n.d.
174. American University of Beirut, 2010.
175. Other universities in Lebanon have also put in place an IP policy such as Université Saint-Joseph (see <https://www.usj.edu.lb/recherche/pdf/conv.pdf>), and the Lebanese American University (see <https://www.lau.edu.lb/about/policies/R5-intellectual-property-reporting.pdf>).
176. Lebanon, 2014.
177. According to an ArabNet editorial on 21 February 2018, "With over 100 investments having taken place between 2013-2016, Lebanon is one of the thriving capitals of digital innovation in the MENA".
178. According to the Global Entrepreneurship Index, "just because entrepreneurs don't have access to finance, intellectual property protection, or a trained staff does not mean that entrepreneurs do not exist and cannot succeed". Acs, Szerb and Ainsly, 2018.
179. According to the Investment Development Authority of Lebanon (IDAL), 2016, "In 2017, Lebanon ranked fourth worldwide on the Global Ranking for Total Early Stage Entrepreneurial Activity and third for New Firm Entrepreneurs Rate".
180. Lebanon, 2017, provides a detailed list.
181. Other works covered by collective management are dramatic works, printed works and the works of related rights (see footnote 16).
182. The *Lebanese Association for the Production of Sound Recordings* was established in Beirut and manages the rights of producers of sound recordings. However, this association has not yet started operating due to absence of regulatory texts. The Decree No 918 on regulating the mode of establishment and functioning of collective management associations and societies needs ratification.
183. Melki, 2007.
184. WIPO, 2015, p. 51.
185. Melki, 2007, p. 502.
186. Michel Kfoury, aka Wael Kfoury, Urgent Matter Judged in Metn, December 18, 2014, not published.

187. Paul Guiragossian Foundation vs. Tanit and Tabbal, Urgent Matter Judged in Metn, May 2, 2017, not published.
188. Such a decision is rare in Lebanon, and even in France under French copyright law on which the Lebanese copyright law is based.
189. LBCI vs. SACEM, Metn Court of Appeal, April 30, 2018, not published.
190. Sedov, 2017.
191. Mayard, 2015.
192. More information about national technology transfer system in Mauritania is available at E/ESCWA/SDPD/2017/CP.1.
193. World Bank, 2019.
194. Heritage Foundation, 2019.
195. Sedov, 2017.
196. United Nations Sustainable Development Group, n.d.
197. WIPO, 2019a.
198. More information about technology transfer in Morocco available at E/ESCWA/SDPD/2017/CP.6.
199. See <http://www.ccg.ma/en/espace-media/actualites/launch-main-components-innov-invest-fund>.
200. Tossa, 2019.
201. For information on the Maroc Numeric Cluster, see http://www.marocnumericcluster.org/index.php?option=com_content&view=article&id=20&Itemid=58&lang=en.
202. Available at <https://wipolex.wipo.int/en/legislation/details/16674>.
203. For a detailed list of the treaties, see <https://www.wipo.int/treaties/en/summary.jsp>.
204. Office Marocain de la Propriété Industrielle and Commerciale (OMPIC), 2012.
205. In a news release, the President of the European Patent Office (EPO), Benoît Battistelli called this move “a historic step for the European patent system, and it brings to 41 the number of countries for which patent protection can be obtained simultaneously with a single European patent application.” Available at <https://www.epo.org/news-issues/news/2015/20150119.html>.
206. For more on the extension/validation system, see <https://www.epo.org/law-practice/legal-texts/extension-validation-system.html>.
207. See https://www.wipo.int/treaties/en/notifications/budapest/treaty_budapest_327.html.
208. “Designed to double GDP per capita in real terms by 2020, the vision is almost on track: while the Sultanate boasted per capita GDP of \$6,261 in 1995 (\$10,500 in late 2018), today it stands at \$15,700. Though it had already reached its ambitious benchmark of \$22,000 GDP per capita as early as 2012 (i.e. a doubling of real GDP per capita in 1995 dollars), the 2014 collapse in oil prices set the economy back a few years”. <https://www.thebusinessyear.com/oman-2019/wrapping-up-vision-2020-solidifying-vision-2040/focus>.
209. For more information about technology transfer in Oman see E/ESCWA/SDPD/2017/CP.3.
210. For more on Oman Vision 2040 see <https://www.2040.om/en/oman-vision-2040/about-the-vision/>.
211. Institute for Economics & Peace, Global Peace Index 2019, 2019, p. 96.
212. Pauceanu, 2016.
213. Al-Balushi, 2014.
214. See <https://www.trc.gov.om/trcweb/about/chairman-message>.
215. For more on the Innovation Park in Muscat (IPM), see <https://www.ipm.om/en/Pages/Explore.aspx>.
216. Sultan Qaboos University (SQU), see <https://www.squ.edu.om/Centres>.
217. The goal to build a national culture of innovation and technological advancement is rooted in the distinguished past of Islamic research and discovery. The world’s economy during the Golden Age of Islam under Abbasid dynasty (750 to 1258) profited greatly from the creative minds of Islamic theorists, scholars, and scientists living in Baghdad. <https://vision2030.gov.sa/en>
218. Arabnet, 2017, p. 10.
219. Some of the initiatives in the previous National Transformation Program (NTP) 2020 delivery plan document are now included in the delivery plans of the relevant 2030 Vision.
220. Jadwa, 2016.

221. Bou Khater, 2018, p. 156.
222. It is possible to obtain a Saudi patent by filing for National Phase Entry from a foreign PCT application. The WIPO web site contains a complete list of WIPO administered treaties that Saudi Arabia is a contracting party to. Available at <https://wipolex.wipo.int/en/legislation/profile/SA>.
223. Article 35 of the Saudi Patent Law of 2004.
224. Judgments are final unless they violate Islamic principles or any codified regulations or are based on incorrect application or interpretation of the same, including the judicial precedents established by the Administrative Supreme Court; or if the judgment is issued by a non-competent court; or by a court not duly formed according to the law; or is based on incorrect characterization or description of facts; or contradicts a previous judgment between the same parties. If any of the above causes exists, the judgment of the Administrative Court of Appeal is then subject to a further stage of cassation before the Administrative Supreme Court.
225. The SAIP board of directors is composed of representatives from the ministries of education, finance, national economy and planning, foreign affairs, communications and IT, the Saudi Food and Drugs Authority (SFDA), KACST, the Directorate of Customs and two members representing the private sector. See <https://saip.gov.sa/en/home/>.
226. SAIP has assumed responsibility as the official registry for all IPRs in the Kingdom.
227. In March 2019, SAIP launched the IP Leaders Program offering a package of incentives over 12 months to encourage and motivate young creators.
228. This responsibility is due to be transferred to SAIP, which will ultimately become the official registry for all IPRs in the Kingdom.
229. Trademarks are registered at the Ministry of Commerce and Investment. There is no procedure in place for copyright registration. Since Saudi Arabia is a member to the Berne Convention, any original work is protected without registration. Ministry of Media is responsible for copyright protection and enforcement.
230. They receive periodic and programmed training by the WIPO, the European Patent Office (EPO), the United States Patent and Trade Office (USPTO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of China, and other institutions concerned with patents.
231. This pendency by disposition date is in line with developed economies such as the United Kingdom and South Korea, where the time length average is 18 to 36 months.
232. See <https://www.ksu.edu.sa/en/research.html>.
233. It was ranked sixty-third in 2014 with a total of 33 United States utility patents. In 2013 it was ranked seventy-fourth with a total of 27 United State utility patents. See <https://news.ksu.edu.sa/en/node/112180>.
234. The laboratory consists of a mechanical workshop, an industrial chemistry unit, a scanning unit with optical microscopes, polarized light microscopes, a microscope, a general mechanical testing unit and a high-performance computer unit for engineering designs and simulations.
235. See https://dsr.kau.edu.sa/content.aspx?Site_ID=305&lng=EN&cid=91081.
236. See <http://www.kfupm.edu.sa/SitePages/en/Vision-mission-values.aspx>.
237. Available at <http://ttie.kfupm.edu.sa/site/wp-content/uploads/2014/12/KFUPM-IP-Policy-English.pdf>.
238. Ibid. p. 14.
239. Established in 1977 as the Saudi Arabian National Centre for Science and Technology (SANCST) but renamed in 1985.
240. The BADIR Program is a national innovative environment that supports the establishment and advancement of pilot and start-up projects. KACST created it in 2007 with the purpose of supporting business opportunities for enterprises based on technology and the development of technological entrepreneurship.
241. The technology innovation centres (TICs) programme, which promotes the creation of research centres within the industrial sector, is hosted by Saudi academic institutions.
242. Al-Aghar Group is a think tank promoting a knowledge-based society in Saudi Arabia through the engagement of all stakeholders in the discovery of creative and strategic options. The national innovation ecosystem is the main framework through which the task of advancing STI in Saudi Arabia is focused on the six pillars of infrastructure, human capital, governance, innovative capacity, networks and attitudes and finance and capital.
243. Khorsheed, Al-Fawzan and Al-Hargan, 2014.
244. See <https://www.gccpo.org/DefaultEn.aspx>.

245. The GCC Patent Gazette is available online at <https://www.gccpo.org/PatentGazette/Archive.aspx>.
246. Judge Jasem Saif Buasaibah, head of the judicial inspection department, stated to the Gulf News in a 3 February 2016 article that: "The move reflects the country's interest in protecting intellectual property rights and making quicker and more effective decisions in intellectual property rights-related disputes".
247. See <http://www.dubaidded.ae/Arabic/Pages/default.aspx>.
248. The award is granted once a year in exhibitions and conferences related to inventions. It is limited to inventors from the GCC member States for a financial prize not exceeding 100.000 Saudi riyals.
249. Article 20, Economic Agreement Between the GCC States, 2001.
250. The sixth recommendation can be accessed from https://www.wipo.int/edocs/mdocs/mdocs/en/cdip_22/cdip_22_women_and_ip.pdf.
251. LAS Council Resolution No. 6071, dated March 12, 2000 and the LAS Resolution No. 89/1 dated April 4, 2012, concerning the establishment of the IP and Competitiveness Department within the organizational structure of the Economic Affairs Sector. https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ace_9/wipo_ace_9_16.docx.
252. Eight coordination meetings have been held: Qatar in October 2002; Oman in September 2003; LAS Headquarters in January 2006; Tunisia in June 2007; Lebanon in October 2009; Casablanca in 2012; Jordan in December 2015; and Egypt in April 2018.
253. The Arab Center for Legal and Judicial Research is a specialized LAS body operating under the supervision of the Council of Arab Ministers of Justice. Available at <https://carjj.org/laws>.
254. Documentation from the meeting available at <https://www.unescwa.org/events/egm-intellectual-property-systems-arab-region>.
255. Alkasmi, 2018, p. 9.
256. According to Mirek Dusek, Deputy Head of the Centre for Geopolitical and Regional Affairs, Member of the Executive Committee, World Economic Forum, "The Arab region will need its private sector to address youth unemployment, the current skills gap for the Fourth Industrial Revolution and the inclusion of women in the workforce. Start-ups, and the entrepreneurs building them, are key to a strategic public-private dialogue on these issues and to creating corresponding new opportunities in society." ArabNet, 2019.
257. Among the selected start-ups are: Wahed (United Arab Emirates) which is the world's first halal investment platform; MonoJo (Jordan), a biotech company that uses camel milk to develop antibodies; Proximie (Lebanon) which uses augmented reality so that surgeons can contribute remotely to clinical procedures; Malaem (Bahrain) provides a platform to meet fellow football players and book pitches; Akkasa (Oman) a production company influencing its country's cultural landscape; Coded (Kuwait) offers coding boot camps to the Arab region; Clean City M3kod (Morocco), which is an app for civic engagement; FalconViz (Saudi Arabia) a company that conducts mapping with autonomous drones, including that of cultural heritage sites.
258. Ommundsen and Kteily, 2018.
259. Woetzel, 2015.
260. The annual Global Entrepreneurship Index measures the quality of entrepreneurship and the degree of support to the entrepreneurship ecosystem across 14 factors. Scores on the GEI range from 0 to 100 per cent. See Acs, Szerb and Lloyd, 2018.
261. Yousef, 2004, p. 101.
262. Available at <https://www.insead.edu/events/mena-talent-competitiveness-index-2017>.
263. CB Insights, 2017.
264. Arab Economic and Social Development Summit, Beirut Declaration 2019, 23 January. Available at <https://beirutsummit.gov.lb/MoreNews.aspx?id=238>.
265. Arabnet, 2016, p. 10.
266. MAGNiTT, 2019, p. 7.
267. See annex, table A.3.
268. Article 67 of the Egyptian Constitution, available at <https://www.wipo.int/edocs/lexdocs/laws/en/eg/eg060en.pdf>; Article 41 of the Tunisian Constitution, available at <https://wipolex.wipo.int/en/text/440322>.
269. Zouag and Kadiri, 2014, p. 238.
270. WIPO, 2002.
271. World Trade Organization (WTO), 2014.

272. Ward and Peppard, 2013.
273. Semiu and Shamsudeen, 2012, p. 4.
274. GCC States such as Kuwait, Qatar and the United Arab Emirates have set targets to increase R&D expenditures as a percentage of GDP. Other countries should be encouraged to set and meet appropriate targets.
275. Tadros, 2015, p. 2.
276. Without necessarily unifying their IPRs management in a regional organization such ARIPO and OAPI in Africa.
277. Reichman, 2009.
278. The Sultanate of Oman was the first to release “Oman Vision 2020” in 1995, followed by Bahrain (The Economic Vision 2030) and Qatar (Qatar National Vision 2030) in 2008, Kuwait (Kuwait Vision 2035) and the United Arab Emirates (UAE Vision 2021) in 2010, Jordan in 2015, and Saudi Arabia with its Vision 2030 strategy issued in 2016. Several of these documents have since been updated or released in new forms including Oman and Kuwait.
279. When combined with regular reviews of meeting their objectives, as has been the case in the United Arab Emirates, the “Visions” can become indicators of having achieved significant milestones.
280. Aleman, 2014, pp. 61-86.
281. Ruse-Khan, 2011.
282. The WIPO has established two databases: “IP Outreach in Practice - Communication Campaigns Database” available at <https://www.wipo.int/ip-outreach/en/tools/practice/> and “IP Outreach Research - Surveys Database” available at <https://www.wipo.int/ip-outreach/en/tools/research/>.
283. See WIPO’s Training and Awareness-raising Activities, available at <https://www.wipo.int/enforcement/en/activities/current.html>.
284. The practical steps are detailed at <https://www.wipo.int/enforcement/en/awareness-raising>.
285. WIPO, 2017b, p. 4.
286. Canadian Intellectual Property Office (CIPO), 2002, p. 5.
287. CIPO, 2017.
288. Survey on financing and growth of SMEs, Industry Canada, 2011 and 2014, available at https://www.ic.gc.ca/eic/site/061.nsf/eng/h_02774.html.
289. Ibid.
290. WIPO, 2017a.
291. WIPO, 2014.
292. See definition at <https://www.wipo.int/ipstrategies/en/>.
293. WIPO, 2016.
294. Ibid.
295. Mendes, 2014, p. 13.
296. Ibid., p. 16.
297. Misrahi, 2013.
298. WIPO, 2016.
299. Tindemans, Frade and Zahlan, 2006, p. 79.
300. See, Stages of Development, Institute for Strategy and Competitiveness, Harvard Business School, available at <https://www.isc.hbs.edu/competitiveness-economic-development/frameworks-and-key-concepts/Pages/shapes-of-development.aspx>.
301. Notably the American Bayh-Dole Act (P.L. 96-517, Dec. 12, 1980) which made changes to the ownership of inventions created using federal funding. Before the act was adopted ownership of any such invention, regardless of where the person worked, had to be signed over to the federal government. After the adoption of the act, universities, small businesses and non-profit organizations could choose to pursue ownership before the government.
302. Ruimy, 2017, p. 22.
303. Lambert Toolkit, online guide available at <https://www.gov.uk/guidance/university-and-business-collaboration-agreements-lambert-toolkit>.
304. Eggington, Osborn and Kaplan, 2013, p. 65.

- 305. Brant and Lohse, 2013, p. 7.
- 306. De Rassenfosse, 2012, p. 8.
- 307. Ibid., p. 5.
- 308. Brant and Lohse, 2013, p. 13.
- 309. ICC, 2016.
- 310. See Zuallcobley and others, 2012, p. 4.
- 311. Although tribunals are authorized to seek the assistance of experts in order to address these complexities, this technical assistance does not discharge the ultimate responsibility of a judge to decide the matter on merit.
- 312. The statistics are based on data collected from IP offices or extracted from WIPO's operational databases. Data might be missing for some years and offices or may be incomplete for some origins.



Intellectual property (IP) is a key legal construct in a technology and knowledge driven economy. Mechanisms, such as frameworks, policies and laws, are key to addressing challenges and balancing research and development management with enhanced innovation and entrepreneurship to satisfy global societal needs. In the Arab region, efforts have been made to improve the protection and exploitation of intellectual property rights; however more needs to be done.

The present report is a desk review of intellectual property laws and practices, specifically patent and copyright, in some Arab countries. Some best practices from other countries are also highlighted. Practical solutions are proposed to achieve a balance between strong intellectual property protection and a weak intellectual property system. The report concludes with several recommendations related to generating, securing, enforcing and commercializing intellectual property rights, which can assist the development of Arab IP systems.

