

CHECKLIST

The Intellectual Property Office (IPO) of the Future

by The IPO of the Future Think Tank

Purpose

The original Intellectual Property Office of the Future Report (Report) provides a comprehensive resource for Intellectual Property Offices (IPOs), large and small, in developing and developed countries, to future-proof their operations and structures, and to proactively engage with their planning and positioning requirements in view of the environment and requirements they are likely to face.

This IPO of the Future Checklist (Checklist) is a companion piece to the Report and attempts to distill its recommendations into a concise net-net format that can be applied and discussed readily in a range of formats, such as setting medium- and longer-term strategies, onboarding of new leadership, management reviews, time-series comparisons, department comparisons, risk assessment and mitigation, and the like.

The Checklist fills the “application gap,” providing IPO recommendations in a concise format that can be used to “check” both applicability of various recommendations to an individual IPO, and the IPO’s status in addressing those recommendations. The Checklist can be used in briefing a new head of office or other new leadership executive regarding the competencies an IPO should be considering, and what it has done to master those competencies. The Checklist can also be used with oversight committees and government administration-level managers to recommend and support budgetary items needed to address likely future (or even present/ imminent) issues identified in the Checklist that a particular IPO may not yet have addressed. Over time, the Checklist can also be used to measure progress toward mastering all applicable items, or within an individual IPO to compare status and efforts across departments. Finally, it can be used to benchmark like-situated IPOs vis-à-vis one another, including by each IPO self-assessing using a “level of maturity” for various items in the Checklist. Such honest, self-reflective maturity assessments and inter-office comparisons can provide depth and nuance to IPO leadership’s ability to understand and address change where most needed.

Applying the same philosophy as was used to develop the IPO of the Future Report, the Checklist aims to embody diversity and inclusion. The Think Tank thus comprises a team of Experts representing different regions, Office sizes, and development levels of the countries these Offices serve, including current and former heads of IP Offices:

- **Loreto Bresky, National Director, Chilean Industrial Property Institute (INAPI)**
- **Catherine Chammartin, Director General, Swiss Federal Institute of Intellectual Property (IPI)**
- **Konstantinos Georgaras, Chief Executive Officer, Canadian Intellectual Property Office**
- **David Kappos, Director, United States Patent and Trademark Office (USPTO) (2009–2013)**
- **Rena Lee, Chief Executive, Intellectual Property Office of Singapore (IPOS)**
- **Tim Moss, Chief Executive and Comptroller General, United Kingdom Intellectual Property Office (2017–2022) (IPO UK)**
- **Sune Stampe Sørensen, Director General, CEO, Danish Patent and Trademark Office**

Special thanks to **Sergio Escudero, Head International Affairs and Policy Department, Chilean Industrial Property Institute (INAPI)**, and **Denisse Perez, Legal Adviser, International Affairs and Policy Department Chilean Industrial Property Institute (INAPI)**, and to the staff of the IPOs represented in this Expert Group for their support in producing the Checklist.

Why

The Report addresses the main challenges IPOs face based on two main perspectives: their traditional roles or core mandates; and their wider role in supporting and incentivizing innovation. The Checklist can help IPOs assess which of the suggested activities should be pursued first, based on their priorities. However, some outcomes depend on the achievement of certain basic priorities.

An IPO can use the Checklist to identify its primary and secondary mandate outcomes and—most importantly—whether the IPO has a sound foundation to achieve these goals.

Last but not least, the Expert Group took into consideration that regardless of the order of priorities, outcomes must be in conformity with the law and, where discretionary power exists, IPOs should be taking into consideration the interests of all stakeholders.

How to Read the Checklist

The Checklist breaks down all the outcomes explained by the Report into Foundational items, Core items, and Beyond Core items. Each section includes a reference to the corresponding section of the Report for an extended explanation of what is meant for each of the items.

Self-Assessment: Overview of Internal and External Factors

(Think: Balanced Scorecard Assessment)

CORE <i>How good are you at...?</i>	BEYOND CORE <i>Should you look at...?</i>	FOUNDATIONAL <i>Do you have...?</i>
<div><div><input type="checkbox"/> Optimal pendency (3.1.B)</div><div><input type="checkbox"/> Engaging users (3.2.F)</div><div><input type="checkbox"/> Ensuring quality services to stakeholders and internally integrating services across multiple forms of IP (3.2.G)</div><div><input type="checkbox"/> Increasing market efficiency with ownership information (3.2.I)</div></div>	<div><div><input type="checkbox"/> Harmonizing IP laws (3.1.A)</div><div><input type="checkbox"/> Connecting across a multitude of stakeholders (3.2.F)</div><div><input type="checkbox"/> Supporting research and innovation ecosystem (3.2.H)</div><div><input type="checkbox"/> Increasing market performance through IP valuation (3.2.J)</div><div><input type="checkbox"/> Increasing trust and respect for IP through enforcement (3.2.K)</div><div><input type="checkbox"/> Raising awareness of and providing education on IP benefits (3.2.L)</div><div><input type="checkbox"/> Informing and supporting policy development (3.2.M)</div><div><input type="checkbox"/> Enabling AI and other disruptive technologies (3.2.N)</div></div>	<div><div><input type="checkbox"/> Sufficient Financial resources and stewardship (3.1.E)</div><div><input type="checkbox"/> The capacity to evaluate, deploy, develop, and manage new technology to adapt services (3.1.C)</div><div><input type="checkbox"/> The right human resources (3.1.D)</div><div><input type="checkbox"/> Lessons learned from the pandemic (Post-COVID-19 transformation) (Part 4)</div><div><input type="checkbox"/> The capacity to become a data-driven office (3.2.O)</div></div>
<div><div>ENVIRONMENTAL SCAN OF EXTERNAL FACTORS</div><div>How are the world and conditions outside of the IPO affecting priorities, strategies, and actions?</div><div><div><div><input type="checkbox"/> Growing value and demand for IP</div><div><input type="checkbox"/> Disruptive technologies</div><div><input type="checkbox"/> Diversity, equity, and Inclusion</div><div><input type="checkbox"/> Intergenerational preferences</div></div><div><div><input type="checkbox"/> Globalization</div><div><input type="checkbox"/> Informal and non-traditional forms of IP</div><div><input type="checkbox"/> Anti-IP sentiment</div><div><input type="checkbox"/> Evolving domestic and international policies and strategies</div></div></div></div>		

A Note on External Factors

The Report was built based on several factors that may affect how IPOs address their core and non-core mandates, as well as those mandates themselves. The Report acknowledges that the pace of global, technological, economic, and societal change is accelerating and evolving in sometimes unforeseen ways. These external changes test the strength of the intellectual property (IP) system, the value of intellectual property rights (IPRs), and the confidence in IPOs. Environmental scanning of changing factors and conditions is critical for IPOs to keep abreast of external and internal factors that may affect operations and priorities.

Intergenerational preferences¹ or conceptions about IP requirements are evolving and challenging the traditional views on the demand for and use of IPRs. There has also been a fundamental shift to ensure that IPOs themselves represent new social values; hence, diversity, equity, and inclusion concerns have become key in assuring equal access to the IP system.

Disruptive technologies, such as artificial intelligence (AI),² often operate in areas where the regulatory environment is uncertain, and current IPO structures may not readily facilitate their deployment. For many countries, applicable IP laws pre-date the Internet, calling into question whether such laws remain fit for purpose.

The Report invites IPOs to consider how private IPRs supplant or complement **formal IPRs**.³ Indeed, in response to the exponential growth in online retail, some firms have created private IPR systems in which IPRs are issued and enforced online.

IPOs could also consider responding proactively to **anti-IP sentiment**⁴ in times of crisis. Striking the right balance between competing interests is challenging, and there will be instances of undue pressure on governments, as well as misuse, underuse, or overuse of IP by IP owners. Certain instances, such as patent “trolling” or trademark “squatting,” have exacerbated the situation further and have generated anti-IP sentiment. Also, the early pandemic response, for example, raised concerns in certain sectors.

Finally, **the pandemic**⁵ brought about two irrefutable facts and challenges. First, it acted as an accelerant to digital transformation, increasing demand for IP. And the launch of virtual platforms, such as the metaverse, may challenge use of IPRs in a virtual space. Second, it represented one of the largest external shocks in a generation. IPOs gained experience while working virtually during the pandemic, including technological advancement, maintaining quality and productivity in a virtual space, and introducing new work arrangements. Additionally, during the pandemic many IPOs experienced an unusual increase in the demand for their services, mainly in the trademark space, which has lead to an increase in the processing time of IP applications and controversies among parties. Therefore, IPOs could consider their role in staying abreast of developments and informing users regarding IPR protection in the virtual space. Additionally, they can use the lessons learned from working virtually to create a workplace of the future, one that can access diverse talent from across domestic regions and create new quality of life and work-life balance aspirations—all while maintaining or improving work-product quality and productivity.

In addition to the need to continue delivering on core mandates, all these evolving environmental factors require IPOs to consider how to continue delivering on core mandates to remain relevant and effective in the present, and to plan for forthcoming opportunities and challenges, in building themselves into an IPO of the Future.

¹ Report, p. 15.
² Id, p. 10.
³ Id, p. 15–16.
⁴ Id, p. 10.
⁵ Id, p. 44.

Checklist of Considerations Foundational

Financial Resources and Stewardship [3.1 A]	<div><input type="checkbox"/> Financial autonomy and sustainability. A number of funding models exist based on domestic circumstances, authorities, and independence. Financial autonomy allows IPOs to adapt to changes in the market and to make long-term infrastructure modernization plans. Financial autonomy requires heightened transparency and stewardship.</div> <div><input type="checkbox"/> Responsiveness to market demand. IPOs can put in place mechanisms enabling them to weather the up and down cycles of incoming IP applications, to ensure enough—not too little or too much—funding to accomplish their missions, to obtain supplemental funding quickly if needed, and to return excess funding as appropriate.</div> <div><input type="checkbox"/> Skill set. New skills may be needed to understand and handle the macro- and micro-economics surrounding the IPO of the Future and its role in the larger economy. Positions such as CFOs, financial management analysts, business analysts, and chief economists can apply private sector approaches to advise IPOs on maximizing the benefits of operating like a financially sound business.</div>
Evaluating, Deploying, Developing and Managing New Technologies [3.1 C]	<div><input type="checkbox"/> Take smart risks. Recognizing that IT is complicated, it will be essential for the IPO of the Future to attract and retain IT talent; support continuous experimentation; engage in iterative pilots; and engage stakeholders in IT development.</div> <div><input type="checkbox"/> Develop shared tools. Consider co-deployment with other IPOs that have similar priorities and that face similar challenges through open source software; sharing code through platforms; collaborating multilaterally through coalitions; and WIPO committees.</div> <div><input type="checkbox"/> Invest in cybersecurity. Cybersecurity in IPOs is likely to emerge as a major topic for the IPO of the Future. The growth in importance of IP as a competitive differentiator, coupled with the heightened benefits associated with a time-to-market advantage, make IPOs increasingly attractive targets for hackers.</div>
Human Resources [3.1 D]	<div><input type="checkbox"/> Ensure diversity, equity, and inclusion. IPOs must work towards ensuring that they represent and reflect the diversity of their applicants.</div> <div><input type="checkbox"/> Identify new employment opportunities. Today, trademark examiners, patent examiners, and many other staff members in IPOs are public servants with full-time, life-long (or, at least, long-term) employment. The introduction of new technologies, may cause workforce changes, creating new opportunities for workers even as previous work becomes automated</div>
Becoming a Data-Driven Organization [3.2 0]	<div><input type="checkbox"/> Use data purposefully. An IPO can be data-driven and capable of leveraging the full value of data. It can be an early adopter of data-driven digital technologies to benefit its stakeholders.</div> <div><input type="checkbox"/> Adopt a data strategy and data stewardship. This data-driven approach requires IPOs to develop an enterprise-wide data strategy, detailing the management of data across the organization (i.e., ensuring that it is used ethically and stored securely).</div> <div><input type="checkbox"/> Avoid introduction of bias in datasets. IPOs must ensure that their data and the uses of such data are free from bias or discrimination.</div> <div><input type="checkbox"/> Chief Data Officer (CDO). As organizations have recognized the importance of business intelligence and data management to operations, the role of the Chief Data Officer (CDO) has become more visible and crucial. IPOs can appoint Chief Data Officers and can establish data science centers of excellence to leverage the full value of data.</div>
Post-COVID Transformation [4]	<div><input type="checkbox"/> Many IPOs have not only survived but thrived through the COVID-19 pandemic. Working virtually resulted in many advancements in technology, evolved management and hiring practices, and redefined traditional organizational structures. IPOs should reflect on lessons learned during the pandemic, invest in areas that have benefited from remote work, address gaps that have become apparent, expand sourcing of talent, leverage and develop new technologies, etc.</div>

Checklist of Considerations Core

Optimal Pendency [3.1 B]	<div><input type="checkbox"/> Consider all factors for optimal pendency. Consider a multitude of factors in determining optimal pendency for specific applicant needs, not just speed.</div> <div><input type="checkbox"/> Balance optimal pendency with quality and free competition. Quality must remain paramount, and time must also be balanced against the public interest in certainty in the marketplace.</div> <div><input type="checkbox"/> Provide options to stakeholders. Ensure optionality is provided to applicants to proceed at a desired speed (e.g., accelerated processes, Patent Prosecution Highway (PPH)).</div>
Ensuring Quality Services to Stakeholders and Internally Integrated Services Across Multiple Forms of IP [3.2 G]	<div><input type="checkbox"/> Integration: IPRs have traditionally been based on separate rights derived from distinct laws and handled by distinct organizational structures within IPOs. In some organizations, these functions are co-located, but there sometimes remain deeply entrenched silos. In other instances, all forms of IPRs are spread across different agencies. This structure can be challenging for stakeholders seeking multiple forms of IP as part of their IP bundle to help them get their product to market. IPOs could help innovators and creators navigate these complex bureaucracies or develop more integrated application processes.</div> <div><input type="checkbox"/> Improve the applicant's experience. Excellence in the design and delivery of services promotes confidence in IPOs, and contributes to achieving public policy goals, efficient service delivery, and better service experiences for applicants.</div>
Increasing Market Efficiency with Ownership Information [3.2 I]	<div><input type="checkbox"/> Secure the quality and availability of information on the register. IPOs have a fundamental role in both granting quality IPRs and identifying clear ownership so as to ensure an efficient and transparent IP marketplace, in turn raising confidence and trust in the marketplace. More can be done to ensure the quality of information on the register and to ensure that existing information is readily available.</div>

Checklist of Considerations Beyond Core

<div>Harmonization</div> <div>[3.1 E]</div>	<div><div><input type="checkbox"/> Pursue substantive and procedural harmonization. In an increasingly globalizing marketplace, consider <i>Harmonization by Design</i> to increase consistency, predictability, efficiency, and quality.</div><div><input type="checkbox"/> Pursue bottom-up and top-down harmonization. Pursue a “bottom-up” approach through the bilateral efforts of individual IPOs, which focuses on increased efficiency and network effects. At the same time, pursue a “top-down” approach, which focuses on across-the-board adoption of harmonized rules, created by substantial groups of nations.</div><div><input type="checkbox"/> Pursue harmonization in all possible areas. Consider international harmonization of IP systems to provide a predictable and level global playing field: adopt practical mutual recognition agreements, such as the GPPH; support data and work-sharing through online platforms; enable IT interoperability; allow for consistency of forms, information sought, timelines; facilitate regional IP administration (e.g., EPO, EUIPO, ARIPO).</div></div>
<div>Connecting Across a Multitude of Stakeholders: IPOs Do Not Operate in a Bubble</div> <div>[3.2 F]</div>	<div><p>IPOs are in a unique position in the innovation ecosystem to connect common interests, including applicants, businesses, associations, professionals, academics, other government agencies, international counterparts, etc.</p><div><div><input type="checkbox"/> Engage directly with stakeholders. IPOs should directly engage innovators and SMEs to develop a clearer understanding of their business goals and IP strategies, including an understanding of those not seeking IPRs.</div><div><input type="checkbox"/> Take into consideration professionals and professional associations. IP professionals are key interlocutors between IPOs and IPR seekers. In a sense, IPOs and IP professionals jointly deliver IPRs and services to stakeholders.</div><div><input type="checkbox"/> Balance interests. IPOs must develop a thorough understanding of stakeholders to advance areas of common interest and at times must balance competing interests while maintaining the public interest.</div><div><input type="checkbox"/> Inform researchers. IPOs can play a role in informing researchers, academics, and think tanks about IP-filing and technology trends to help build capacity and interest in undertaking research that can benefit the IP system.</div><div><input type="checkbox"/> Inform other government agencies. In some jurisdictions, various IP functions are diffused across several agencies. IPOs can help innovators and creators navigate these complex bureaucracies. IPOs can play an active role in policy development, ensuring that legislative, regulatory, practice, and administrative procedures across multiple agencies are informed by IPO expertise and that these procedures meet stakeholder needs.</div></div></div>
<div>Supporting Research and Innovation Ecosystem</div> <div>[3.2 H]</div>	<div><div><input type="checkbox"/> Share information and raise awareness of IP. A fundamental purpose of IP is to support innovation and creativity. One way it achieves this goal is by fostering an environment where the knowledge contained in a patent application, once published, is public and available for all to learn and build upon. IPOs can support innovators by raising awareness to help them understand how to access and use available information in developing their innovation and IP strategies (e.g., prior art searches, IP databases, IP landscapes).</div><div><input type="checkbox"/> Ensure sufficient disclosure. IPOs must ensure that information included in IP applications is sufficient to live up to the regulatory bargain of disclosure for the public benefit.</div></div>

Checklist of Considerations Beyond Core

<div>Increasing Marketplace Performance Through IP Valuation</div> <div>[3.2 J]</div>	<div><div><input type="checkbox"/> Raise awareness on the importance of IP valuation. Despite the importance of IP as a business asset, companies face many barriers in conducting IP valuation, including lack of valuation expertise; difficulty finding an IP valuation firm; lack of internal capacity; lack of consensus on acceptable methodologies; accounting standards that make it difficult to value intangible assets; the cost of conducting valuation; concerns over impartiality or credibility; lack of awareness; and other competing business issues taking precedence over valuation.</div><div><input type="checkbox"/> Fill the gap with caution. IP valuation is best left for IP professionals and valuation firms, rather than for IPOs. IPOs can raise awareness of the importance of having an IP valuation as part of a company’s business strategy without interfering with the marketplace for conducting such valuations.</div></div>
<div>Increase Trust and Respect for IP Through Enforcement</div> <div>[3.2 K]</div>	<div><div><input type="checkbox"/> Participate in an IP enforcement coordination center. Some countries have created a central coordination unit outside of their IPOs to fight against counterfeits, piracy, and other IP crimes. These countries aim to remedy the inefficiencies resulting from multiple national agencies looking at these IP crimes in isolation.</div><div><input type="checkbox"/> Act as an information hub. IPOs can act as a hub for information exchange across a range of government agencies and private sector interests involved with enforcement.</div><div><input type="checkbox"/> Undertake research. As part of broader networks or focused economic research groups (e.g., the EPO Conservatory), IPOs can undertake economic research and tracking of issues to understand marketplace activities, such as the impact of counterfeiting.</div><div><input type="checkbox"/> Raise awareness. IPOs can provide basic information or point to available resources internationally to raise awareness of the value and importance of respecting IP.</div></div>
<div>Raising Awareness and Providing Education on IP Benefits (in Particular, Benefits to Apply for and Use IP)</div> <div>[3.2 I]</div>	<div><p>IPOs can contribute to wider IP awareness and education, and support the development and commercialization of IP, through a range of programs that inform and educate individuals and businesses.</p><div><div><input type="checkbox"/> Measure Impact. IPOs should develop meaningful performance indicators on awareness activities.</div><div><input type="checkbox"/> Leverage existing awareness tools. Rather than generating new information resources, IPOs should tap into an extensive network to learn from best practices and adapt well-developed information products from other jurisdictions.</div><div><input type="checkbox"/> Focus awareness activities. With limited budgets, IPOs must tailor efforts to address specific gaps that exist in the market, deliberately and strategically targeting sectors, regions, and technologies, and leveraging channels available to intermediaries.</div><div><input type="checkbox"/> Align activities with government priorities. IPOs should target support to underrepresented groups, such as indigenous people, women, SMEs, certain technology sectors, etc.</div><div><input type="checkbox"/> Work with partners to reach potential rights-seekers. IPOs do not have the mandate, resources, or capacity to reach all potential IP stakeholders. IPOs can partner with intermediaries (e.g., universities, business associations, IP professionals) and leverage existing channels to extend the reach of awareness activities.</div><div><input type="checkbox"/> Fill gaps until the private or non-profit sectors step in. In some instances, a gap may exist that would best fall within the responsibility of the private or non-profit sectors, and there may be a temporary role for the IPO until such time as the private sector market builds sufficient capacity.</div></div></div>

Checklist of Considerations Beyond Core

<p>Inform and Support Policy Development [3.2 M]</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Become a center of expertise on IP and part of the policymaking process. The knowledge gathered by an IPO in the administration of IPRs provides a critical source of information and expertise to inform and influence IP policy development. IPOs can provide expertise on how IP policy and IPO administration interact with other complex policy areas, such as trade, economic development, competition law, standard setting, standard essential patents, industrial policy, and national security. <input type="checkbox"/> Create an evidence base to inform policy development. IPOs can invest in building on the nascent but growing network of IP economists, as well as experts at WIPO, OECD, and academic and research institutions, to build a robust evidence base, supporting policy development and informing academic and media activities. <input type="checkbox"/> Adopt the 2019 Guidelines to Use Evidence from Research to Support Policymaking. IPOs can adopt the <u>2019 inaugural guidelines for using research evidence to support policymaking</u>. The guidelines provide best practices to ensure that the highest possible quality of evidence is used in the decision-making process at IPOs and in government generally.
<p>Enabling Artificial Intelligence and Other Disruptive Technologies [3.2 N]</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Monitor disruptive technologies. IPOs can continually monitor for signals of disruptive technologies and improve responsiveness to emerging market needs, so as to establish rights with maximum legal certainty, as quickly as possible. <input type="checkbox"/> Stay current. IPOs can remain current through: (i) exchange of expertise with counterpart IPOs; (ii) bringing private sector expertise into the IPO examination process; (iii) crowdsourcing talent or expertise; (iv) using big data and non-traditional search methodologies and tools; and (v) deploying machine learning. <input type="checkbox"/> Utilize AI and disruptive technologies: IPOs should utilize AI to gain efficiencies in the delivery of IP services (e.g., classification, prior art search, data analysis, and process automation). Care is required to ensure transparency and unbiased outcomes in decision-making algorithms. <input type="checkbox"/> Use IP data to support AI. AI applications learn by analyzing vast amounts of data, and data is central to supporting AI implementation. IPOs can use their large datasets to provide a mature model for data dissemination. IPOs are stewards of large amounts of administrative data resulting from their IP-granting functions; making these data sets public will provide a useful tool for machine learning. <input type="checkbox"/> Anticipate challenges resulting from AI-generated inventions. Commercial AI-generated works and AI-generated inventions may affect the granting of IPRs and the IP system more generally. IPOs can proactively reflect upon the challenges this will pose to well-established IP concepts, such as the concepts of “author” and “inventor,” and how principles of IP such as those defining thresholds of originality and disclosure requirements can provide built-in means for the IP framework to adapt to new realities.

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OFFICE (IPO) OF THE FUTURE

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by

THE IPO OF THE FUTURE THINK TANK

Released in November 2020

INTRODUCTION

In April 2019, the International Trademark Association (INTA) launched the Intellectual Property Office (IPO) of the Future Think Tank (Think Tank). The objective of this initiative is to provide a thought-provoking and holistic reflection on what an IPO might look like in the future, in particular over the next 10 to 20 years.

The world of Intellectual Property (IP) is changing quickly and in many ways, including the soaring value of intangibles; increasing IP filing volumes and the volatility of filings; the emergence of new countries as IP powerhouses; the increasing internationalization of IP; the growing complexity and interdisciplinary nature of technologies; the changing nature of work and businesses with disruptive technologies; the deepening intersection between IP, trade, anti-trust, and innovation; the diversity of innovation emerging from developing countries; and the more centralized role of IP in fueling the innovation required to address the world's most daunting challenges including finding appropriate solutions to curb increasing threats to public health, human and animal life, and food security.

With so much change occurring simultaneously, we must ensure that IPOs of the future are nimble and robust enough to absorb, manage, facilitate, and enable change.

The Think Tank offers this report as a view of what the IPO of the Future might look like. The report reflects the collective input of former and current heads of IPOs and key contributors who formed the project's Expert Group, namely:

- o **Paula Adamson**, General Manager, Trade Mark and Designs Group, IP Australia (2017-2020)
- o **Benoît Battistelli**, President, European Patent Office (EPO) (2010-2018)
- o **Johanne Bélisle**, Chief Executive Officer, Canadian Intellectual Property Office (2015-2020)
- o **Pascal Faure**, Director General, French National Institute for Industrial Property (INPI)
- o **Konstantinos Georgaras**, Chief Executive Officer (interim), Canadian Intellectual Property Office (2020 -)
- o **Om Prakash Gupta**, Controller General of Patents, Designs, and Trade Marks, Office of the Controller General of Patents, Designs & Trademarks of India

- o **David Kappos**, Director, United States Patent and Trademark Office (USPTO) (2009-2013)
- o **Miguel Ángel Margáin**, Director General, Mexican Institute of Industrial Property (IMPI)(2013-2018)
- o **Maximiliano Santa Cruz**, Director, National Institute of Industrial Property of Chile (INAPI) (2009-2018)
- o **Josephine Rima Santiago**, Director General, Intellectual Property Office of the Philippines (IPOPHL) (2015-2019)
- o **Michael Schwager**, Director General, IP Australia
- o **Daren Tang**, in his capacity of Former Chief Executive, Intellectual Property Office of Singapore (IPOS) (2015-2020)
- o **Bemanya Twebaze**, Registrar General, Uganda Registration Services Bureau
- o **Rory Voller**, Commissioner, Companies and Intellectual Property Commission of South Africa, (CIPC)

Catherine Chammartin, Director General, Swiss Federal Institute for Intellectual Property kindly shared some input as well.

The Expert Group was supported by INTA staff: José Luis Londoño, Chief Representative Officer – Latin America and the Caribbean (and Colombian Deputy Superintendent for Industrial Property, 2010-2017, Superintendent of industry and Commerce of Colombia), Hélène Nicora, Chief Representative Officer – Europe, and Renee Garrahan, Associate, Economic Research.

We recognize that each IPO faces different challenges, opportunities, mandates, historical contexts, social imperatives, and economic opportunities. While IPOs of the Future must be tailored for each country, market, and region, there is a commonality of key interests and vision for the future shared by many. This report explores three key themes and a case study:

I. EVOLUTION OF THE IP SYSTEM...*The world has changed*

II. FUTURE CHALLENGES AND OPPORTUNITIES...*The world will continue to change dramatically*

III. THE IPO OF THE FUTURE...*The features of an effective IPO of the Future, one that is built for purpose, including both traditional and nontraditional roles*

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Conclusion

Executive Summary

IPO of the Future Report

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Every Intellectual Property Office (IPO) faces different challenges, opportunities, mandates, historical contexts, and social and economic imperatives. But all IPOs are confronted with a rapidly changing intellectual property (IP) world, including the soaring value of intangibles, the increasing volume of IP filings, the emergence of new countries as IP powerhouses; the increasing internationalization of IP; the growing complexity and interdisciplinary nature of technologies; the changing nature of work and businesses with disruptive technologies; the deepening intersection between IP, trade, antitrust, and innovation; the diversity of innovation emerging from developing countries; and the more centralized role of IP in fueling the innovation required to address the world's most daunting challenges such as finding appropriate solutions to curb increasing threats to public health, human and animal life, and food security.

With so much change occurring simultaneously, IPOs must ensure that they are nimble and robust enough to absorb, manage, facilitate, and enable change, now and in the future. While there is no one-size-fits-all approach that fits all jurisdictions, there is a commonality of key interests and vision for the future shared by many.

This Report on the IPO of the Future provides a holistic reflection on what an IPO might look like in the next 10 to 20 years, via the exploration of three key themes and a case study:

I. EVOLUTION OF THE IP SYSTEM...*The world has changed*

II. FUTURE CHALLENGES AND OPPORTUNITIES...*The world will continue to change dramatically*

III. THE IPO OF THE FUTURE...*The features of an effective IPO of the Future, one that is built for purpose, including both traditional and nontraditional roles*

IV. CASE STUDY...*IPOs Surviving and Thriving Through the COVID-19 Crisis (Applying the IPO of the Future Framework)*

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This Report addresses the following elements:

I / The world has changed, and the IP system has evolved.

In recent decades, the importance of intangible assets has increased significantly, intellectual property rights (IPRs) have increased both in volume and complexity due to the changing nature of innovation, which has become more global, interconnected, and interdisciplinary. This, together with the strengthening of global trade and the development of new technologies, has changed IP stakeholders' needs. IP is playing a different role in our modern digital economy, which underscores the need to include IP considerations in public, industrial, innovation, and economic policies. As a result—and with the increasing use of alternative means to resolve IPR disputes, the development of private regimes for recordation and enforcement of IPRs, the public and business world's lack of understanding, and insufficient communication about the benefits of IPRs—IPOs were influenced to go beyond their role of examining, registering and administering IPRs. Today, IPOs are still performing these traditional tasks, with traditional stakeholders, and facing traditional problems such as backlogs and lack of resources. However, many IPOs are increasingly taking on additional tasks, but with differences in new task selection, their number, and their implementation pace. This results in a diversity of roles among IPOs across the globe. Such additional roles include promoting innovation, supporting the development of broader public policies, raising awareness and providing education on IP, understanding the IP marketplace (including how stakeholders discern IP valuation and make licensing decisions), further collaborating with other IPOs, and supporting enforcement of IPRs.

II / The world will continue to change dramatically.

The pace of global, technological, economic, and societal change is accelerating. These areas are evolving in sometimes unforeseen ways and the changes that are occurring will test the strength of the IP system, the value of IPRs, and the confidence in IPOs. Because new business models and technologies are advancing faster than the pace of legislative change, they raise new challenges for IP legislation, office practices, and policy environments. In this context, there are several game changers and challenges that an efficient IPO of the Future should consider, such as the fourth industrial revolution and increasing globalization fueling enhanced international engagement and further harmonization of IPRs. While substantive harmonization of IP systems appears more and more challenging, procedural harmonization and shared technological solutions are increasingly important for the sake of businesses operating in different markets. The IPO of the Future must also be vigilant about the quality and timeliness of its services, and its fees, so as to meet different users' expectations. Particular attention will need to be paid to the unpredictability of demands for IPRs; business disruptions brought by crises, pandemics and wars; surging volumes of IPR applications; and distorted volumes or quality of IPR applications globally, due to the subsidization of IP applications in certain jurisdictions. Transparency in IP policy and systems will need to be strengthened while bad faith filings kept at bay with appropriate legislation and practices. The rise of private rights systems and informal IP protection, together with transformative technologies and AI inventions (and their questionable eligibility for IP protection), add other complex layers to the equation that the IPO of the Future must consider. Last but not least, as data becomes more important for businesses, so does the demand on IPOs to provide accurate registries, clean and searchable data, and curated information.

III / In this context, to remain relevant, efficient, and sustainable, the IPO of the Future will have specific features, both within its core administrative mandates and beyond traditional roles.

1. In terms of core administrative mandates, the IPO of the Future will need to closely evaluate the suitability of its products and services to respond to an increasing and volatile number of IPR applications, the soaring complexity of these applications, the diversity of businesses strategies, and the evolving needs of all stakeholders in the IP system. These changes require the IPO of the Future to adapt its practices, services, and procedures to become more agile and effective as well as more diverse and inclusive. This includes relying on new technologies to increase speed and efficiency,

and providing more options to stakeholders, while balancing optimal pendency with high quality and free competition. These changes will test the financial resources, financing models, and financial sustainability of IPOs as the need for investments in people, information technology (“IT”) systems, and workplace resources escalates. These changes will also require IPOs to carefully evaluate how best to integrate new tools, how to increase inclusiveness and access to diverse groups that are currently underserved by or lack access to the IP system or understanding of it, how to re-train staff, and how to recruit a new generation of employees with a diverse skillset. In this regard, the IPO of the Future will work with other IPOs to develop solutions and tools that can be shared. These efforts can advantageously serve to further harmonize processes, practices, standards, and tools across regions in an inclusive manner while accommodating each IPO’s individual particularities.

2. In terms of non-traditional roles, IPOs have developed roles beyond their historic mandates of examination, registration, and administration of IPRs, to respond to the challenges described above, while adjusting to factors unique to each of them that dictate the nature and priority of such additional roles. To perform such additional roles, the IPO of the Future will ensure that it works with a multitude of domestic and foreign stakeholders from the public and private sector, from the IP bubble and beyond, to offer stakeholder-centric products and quality, modern, relevant, and tailored services, and addresses gaps in the market and the needs of underrepresented groups. Engagement with diverse stakeholders will help the IPO of the Future to identify best practices through collaboration and to provide targeted IP awareness and education programs, while balancing all interests at stake with the public interest. The IPO of the Future will also support research and innovation ecosystems, by providing assistance to various public and private stakeholders in navigating such ecosystems, and by better understanding IP trends, issues and benefits, especially through education on the benefits of applying for and using IP, and supporting the negotiation and implementation of trade agreements. The IPO of the Future will be entrusted to identify clear ownership of IPRs, to ensure the transparency and trustworthiness of the IP marketplace, and to help with IP valuation and transactions. The IPO of the Future will seek to support the commercialization of IPRs and the deployment of IPR trading platforms. It will also support IP valuation, especially if there is gap in the market not filled by the private sector, including by raising awareness of the importance of IP valuation or of available valuation resources. The IPO of the Future will not get involved in actual enforcement of IPRs but will nevertheless take a supportive role in helping partner agencies secure enforcement of IPRs, thereby increasing confidence in the IP system. This could be done by participating in an IP enforcement coordination center, acting as an information hub, undertaking research, or raising awareness on IPR infringements and benefits and alternative dispute resolution. The IPO of the Future will contribute to national IP systems, by developing IP policy and supporting the modernization of IP legislation and regulations and ensuring that other agencies’ procedures are informed by IPO expertise. The IPO of the Future will be an early adopter of new technologies, enabling artificial intelligence, and using such technologies to gain efficiency in the delivery of IP services. The IPO of the Future will also be data driven and capable of leveraging the full value of data. It will adopt a data strategy and will develop in-house competency in terms of data management as a strategic asset, data protection, data quality, and data access.

IV. Case study: IPOs surviving and thriving through the COVID-19 Crisis

The analytical framework established for the IPO of the Future and the various responses of IPOs to the COVID-19 pandemic, in terms of both their core administrative mandates and other additional mandates, provided more clarity about how the IPO of the Future must equip itself to withstand future crises, and its role and resilience in such crises. It also unveiled potential opportunities to evolve in the aftermath of the pandemic. It appears that during the pandemic, many IPOs have remained focused on their fundamental mandate to provide IPRs and services. In some instances, non-essential activities, or those that are beyond the traditional roles of IPOs, were among the first activities curtailed to maintain mandated requirements. However, it is still too early to tell how successfully IPOs will be in weathering the storm and remaining financially viable in the coming years as operations either return

to normal or pivot to whatever their new normal will be. Regarding opportunities to evolve and thrive through the disruption, some forward-thinking IPOs have been able to step up to support innovators seeking to respond to COVID-19, inform government policies, experiment with technological solutions, leverage data and forecasting, and connect deeply with stakeholders to gather and share intelligence. Necessity has become a driver of innovation within IPOs.

From the case study and the report, it appears that the IPO of the Future will need to be built for purpose (focusing on its core mandate); robust enough to withstand disruptions (based on sound stewardship); and sufficiently nimble, connected, and innovative so as to step up and serve rapidly evolving situations (both in its core and non-traditional roles).

PART I EVOLUTION OF THE IP SYSTEM...

The World Has Changed

In recent decades, intangible assets—IP—including brands, data, technology, creative output, and innovation in all its forms have dramatically increased in importance. Globally, intangible assets now represent 85% of corporate value and surpasses US \$50 trillion.¹ The shift from tangible to intangible value, in which innovation plays a central role, from traditional industries to the knowledge-based economy along with the strengthening of global trade and markets, have had a direct impact on the evolution of the IP system and the role of IPOs. In recent years, for instance, multi-billion-dollar mergers have focused on intangibles like trademarks, copyrights, patents, and trade secrets.

1.1 The Current IP System

Traditionally, the IP system helped create certainty in the marketplace by enabling rights holders to confidently protect and commercialize their IP. IPOs, for their part, focused their role on examining applications, and registering and administering IP rights (IPRs).

Applications for IPRs continue to increase and, in 2018, reached more than 3.3 million applications for patents, 2.1 million for utility models, 14.3 million for trademarks, and 1.3 million for industrial designs, outpacing global economic growth. IPRs are growing both in volume and in complexity, mainly due to the changing nature of the innovation to which they are linked. Innovation has become more global, interconnected, and interdisciplinary due to the broad use of technologies across multiple sectors.

The IP system must adapt not only to the changing nature of innovation but also to the deeper interconnections involved in human creativity, our societies, new ways in which people conduct business and their lives, and the correlated needs of IP stakeholders. This interconnection confirms the importance of IP in our modern digital economy, and underscores the need to include IP considerations in public, industrial, and economic policies.

A successful adaptation of the IP system demands agility, efficiency, effectiveness, diversification, and inclusiveness. It relies on the integration of new tools, and changing practices and procedures, including adapting existing IP rights, or creating new ones. The IP system has managed to effectively deal with the challenges new technologies have brought about. For example, trade secrets can now be protected using blockchain technology and new IPRs have been created to better capture emerging technologies, such as nontraditional marks.

The world has increasingly become technologically dependent. Disruptive technologies, such as artificial intelligence (AI) and blockchain, impact the IP system's relevance and effectiveness. While the degree of impact is subject to debate, the fact that there is an impact is clear. IPOs themselves are also taking advantage of the benefits of these technologies to provide cutting-edge, personalized, and expeditious services to stakeholders, including enhanced searchability and registrability of IPRs. For instance, AI is being assimilated into IPO workflow, resulting in reduced tension between timeliness and quality.

Disruption of the IP system happens at several levels. It includes the increasing use of alternative means to resolve IPR disputes and the development of private regimes for both recordation and enforcement of IPRs. Until recently, these traditional IP functions were largely under the exclusive mandate of public authorities. The IPO of the Future must acknowledge that this may no longer be the reality.

Disruption of the IP system also comes from a lack of understanding and insufficient communication about its benefits. Today, the IP system overall is robust, effective, and evolving. Nevertheless, it

¹ [Footnote: Asselin and Speer, 2019] According to the S&P 500 stock market index, the value of intangible assets as a percentage of the total value of the 500 largest U.S. companies rose from 16% in 1976, to 91% in 2019.

remains underused in some sectors or economies. Current and potential beneficiaries do not take full advantage of the rights, tools, and procedures provided domestically, regionally, and worldwide, to protect their intangible assets.

Balancing international interests. We are a witness to the challenges in both the international and national IP systems that are putting pressures, external and internal, for IP policy makers across the different levels of economy. For one, there are issues relating to realistic normative standards that derive from the developed world that pose special problems for the developing world. A dedicated chapter on intellectual property has increasingly become a crucial mainstay in many multilateral and bilateral trade agreements, some overriding the minimum standards or flexibilities provided in TRIPs. On the other hand, some governments seek to support domestic interests while ensuring that they do not run counter to the fundamental tenets of the IP system. Balancing these international interests is crucial in ensuring an effective IP system that crosses borders.

Balancing domestic interests and understanding evolving public sentiment. Intellectual property rights systems attempt to strike a balance between private and societal benefit. In fact, IP policy has been predicated upon enhancing private rights that in turn fuel innovative and creative endeavors, ultimately leading to immediate or follow-on societal benefit. In some instances, however, private and public IP interests are diametrically opposed, resulting in heated policy debates. The debate is further complicated when considering trade-offs between present private consumption and future societal benefit; differences of interests across types of IP (e.g., patents, trademarks, industrial designs, copyrights, geographical indications, plant varieties, traditional knowledge, cultural expression, trade secrets); and how these dynamics play out differently across jurisdictions.

Overall, the IP system functions well, supporting immeasurable technological advancement and creativity. However, striking the right balance between competing interests is challenging and there will be instances of undue pressure for governments and misuse, underuse, or overuse of IP by IP owners. Certain instances, such as patent “trolling” or trademark “squatting”, have exacerbated the situation further and have generated anti-IP sentiment. In some quarters, this anti-IP sentiment may have been further stoked by a lack of understanding of the IP system by beneficiaries and the public at large; a focus on digital services and fast turnarounds which conflicts with the duration and complexity of IPR registration; slow turnaround times and backlogs in some IPOs that bring uncertainty to the marketplace; commentators’ tendency to portray IPRs negatively or as benefiting only large scale businesses; and, advocacy from IP-skeptic commentators. Most importantly, the issue runs much deeper when trying to describe the net present value of IP and public value across different consumers. In the short-term, IP rights provide a monopoly that may result in higher prices or scarcity of supply for today’s products. This is seen as negative. In the longer-term, however, since we cannot envision what the next new paradigm may be, one that might greatly enhance our lives, there is an under-appreciation for the incentives that the IP system delivers.

A way forward. The IPO of the Future must ensure to look for ways to strike a reasonable balance between and among its stakeholders and to continually monitor and understand the factors driving unfavorable public sentiments. To address some of the many concerns, the IPO of the Future will be responsive to the public at large by ensuring that it grants timely and quality IPRs, and does not grant excessively narrow or overly-broad rights and does not deny or grant rights improvidently, or delay the grant of rights beyond the time period reasonably necessary for quality examination. IPOs’ commitment to pendency, as well as providing transparency, will provide market certainty and maintain the public interest. In instances where perceived sentiment is uneven, IPOs may bring balance to the dialogue. In some instances, the IPO of the Future may need to take on a role to counterbalance points of view that may not fully contemplate the benefits of the IP system itself. IPOs can do this by describing the fundamental precepts of IP and by illustrating how most IP users are making a lasting and long-term contribution to society.

In light of the above, it is imperative to assess the impact of IPRs on innovation, the economy, and society, and then put in place the necessary resources, tools, policies, and authorities to enable an effective IP system.

1.2 IPOs Today

If some have not done so yet, most of Today's IPOs have transitioned from performing the basic examination and regulatory mandates to critical roles that impact on the economic development of the country. In the last twenty years, creativity and innovation have played a central role in economies, leading to a strong shift on the part of governments towards bringing IP to the forefront of policy and recognizing the need for an effective IP system. IPOs are an essential part of the system, dealing with traditional tasks inherent in their historic primary functions, such as IPR examinations and registrations.

Most IPOs are still operating in traditional ways, with traditional stakeholders, and are facing traditional problems, such as backlogs and a lack of resources to address mounting filings. Faced with increasing numbers of applications for trademarks, patents, and designs, and the increasing complexity of applications and new business models, the IPOs of the Future must optimize their services and create new tools to serve stakeholders' needs.² As an example, some IPOs—particularly those in developed countries—have already started to rely on AI and other new technologies to perform search functions and for the processing of applications.

Due to the interplay between globalized markets, national jurisdictions, and local rules, IPOs are increasingly taking on additional tasks. However, with no common understanding about what additional roles IPOs should take on and at what priority; each IPO has decided independently what the nature, implementation pace, and number of its new tasks will be. This has resulted in a significant diversity of roles among IPOs across the globe, whether at national, regional, or international levels. At a high level, IPO roles involve the following:

(i) Innovation and Its Promotion

Innovation is no longer exclusively driven by western economies—Asian and African countries have joined the fray.³ Moreover, globalization has led to a proliferation of cross-border and inter-company innovation. It is almost impossible for one country or one company to innovate individually; innovation is a global and interconnected process. Many IPOs have been required to absorb these innovation-related changes, and to increasingly support innovation at large for the benefit of economic development. This includes a policy focus on incentivizing expensive, failure-prone innovation that otherwise would be subject to under-investment, while at the same time avoiding rewarding innovation that does not truly require exclusivity.

Some IPOs have evolved from being exclusively technical in nature to also becoming stewards of innovation. Such IPOs play a role in promoting IP as a medium of exchange in a knowledge economy and providing education on the effective use of IP.

² Note: Most of the increase in IP applications can be attributed to large IPOs.

³ "Global Innovation Index 2020: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2020.pdf and key findings: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2020_keyfindings.pdf

(ii) Support the Development of Broader Public Policies

Today's IPOs provide expert support to their governments in developing and implementing IP policies, thanks to the legal and practical expertise IPOs have acquired when dealing with IPRs and IP stakeholders.

Today's IPOs also engage on the more public aspects of IP, such as the diffusion of knowledge, the transfer of technology, and the increasingly important role of data. Some IPOs have knowledge transfer divisions and public policy departments dedicated exclusively to that purpose. This added focus enables IPOs to educate stakeholders and build awareness and engagement among stakeholders.

Some IPOs are also now involved in industrial and economic policies. They produce analysis, studies, and reports regarding the relationship of IP to economic growth and the impact of IP on the economy, industry, trade, competitiveness, public health, and jobs.

(iii) Awareness and Education

Increasingly, IPOs have rolled out IP awareness and education programs targeting various audiences, including businesses and innovators, which allow IPOs to contribute to greater IP literacy in their regions. The goals of such awareness programs vary depending on the targeted audience. For instance, programs to educate businesses focus on the added value of registering and enforcing IPRs, such as the benefits related to increased competitiveness and faster business development. Most campaigns targeting the public at large focus on the necessity of protecting the innovation cycle and investment via temporary monopolies, the positive impact of IPRs on the economy, growth, and jobs, as well as the dangers of counterfeiting and piracy.

(iv) IP Marketplace

Some IPOs are working to develop a more comprehensive understanding of the whole IP marketplace and factors that affect the national and international IP system, including understanding IP use after grant and how IP is valued and licensed. While IPOs do not directly have a role in deciding the value of IP or in licensing it, an improved understanding of how stakeholders discern IP valuation and make licensing decisions helps IPOs position themselves to make better decisions in administrative oppositions and cancellations and to better support stakeholders overall. This understanding can also lead to the development of unique programs that benefit stakeholders. For example, Australia's Source IP, Singapore's IP Intermediary, the United States' STEPP, Canada's Explore IP, Philippines' IP Depot, Chile's INAPI Conecta,⁴ and WIPO GREEN all stem from such an understanding and aim to provide stakeholders with helpful information about IPRs and to otherwise facilitate innovation and commercialization.

(V) Further Collaboration with Other IPOs

The last several decades' development of the IP system shows the large degree of integration and harmonization that has unfolded across the global IP regime over time. This has created efficiencies for applicants and IPOs. Although IPOs are familiar with administering IPRs individually, many now collaborate with each other. Information technology, as well as examination, has become the subject of work sharing among IPOs. For instance, the Patent Prosecution Highway (PPH) exemplifies such global collaboration in that it allows patent applications that have been determined as protectable in one PPH jurisdiction to have an accelerated examination in other PPH jurisdictions. And the TM5 ID List is another result of global collaboration. The ID List is designed to enable trademark holders to obtain trademark protection in multiple jurisdictions and has received significant engagement from developing countries.

⁴ <https://www.inapiconecta.cl/>

(VI) Enforcement Support

Some IPOs provide support for IPR enforcement, for example, through an administrative role in enforcement policy and legislation or a central coordinating role between enforcement authorities and private stakeholders. Other IPOs participate in enforcement by taking on an education role, using awareness campaigns to inform stakeholders about the negative impact of IPR infringement, and training enforcement authorities such as customs officers, police officers, and judges. Likewise, some IPOs offer alternative dispute resolution (ADR) services to expedite the resolution of issues or conflicts.

PART II FUTURE CHALLENGES AND OPPORTUNITIES...*The World Will Continue to Change Dramatically*

The pace of global, technological, economic, and societal change is accelerating and evolving in sometimes unforeseen ways. These changes will test the strength of the IP system, the value of IPRs, and the confidence in IPOs. Because new business models and technologies are advancing faster than the pace of legislative change, they raise new challenges for IP legislation, office practices, and policy environments. This section explores ongoing and future challenges and opportunities, as well as game changers, for IPOs of the future.

2.1 The Game Changers to Consider for an Effective IPO of the Future

(i) The Fourth Industrial Revolution

The fourth industrial revolution is disrupting industries worldwide. It is rapidly transforming how businesses operate using transformative technologies to connect the physical world with the digital world. Gartner's (an American research, advisory and information technology firm) 2020 hype cycle⁵ highlights the emerging technologies with significant impact on society and business over the next five to ten years. The 2020 hype cycle indicates that this year's emerging technologies fell into five unique trends:

- (i) composite architectures;
- (ii) algorithmic trust;
- (iii) beyond silicon;
- (iv) formative artificial intelligence (AI); and
- (v) digital me.

In both the 2019 and 2020 hype cycles, there are elements of human considerations; many emerging technologies encompass human considerations. For example, the current workforce and IPO user base is predominantly Generation X and Generation Y (or so-called Millennials). However, we are rapidly moving towards a global workforce and consumer base largely populated by the Generation Z cohort (defined as those born from the mid-1990s to the early 2000s). Generation Z will become the largest group of consumers worldwide in the not-too-distant future. This creates a user and consumer market that is digitally native.

The Generation Z workforce is considered to be highly educated, analytical, challengers of the norm, digitally enabled and ethically motivated. Further, individuals in this generation have more respect for other's creations and are more likely to avoid pirated content than previous generations were.⁶ They are more likely to look for open source solutions. These characteristics and behaviors influence and drive the way in which much of the emerging technologies will be delivered and consumed. Keeping up with new consumers' behaviors will drive IPR owners' decisions, and the IPO of the Future needs to be ready.

5 Panetta, Kasey. "5 Trends Drive the Gartner Hype Cycle for Emerging Technologies, 2020." Smarter With Gartner, 18 August 2020, <https://www.gartner.com/smarterwithgartner/5-trends-drive-the-gartner-hype-cycle-for-emerging-technologies-2020/>.

6 Wodecki, Ben. "EUIPO Report Reveals Half of Gen Z Avoid Pirate Content." Intellectual Property Magazine, 1 Nov. 2019, www.intellectualpropertymagazine.com/world/europe/euipo-report-reveals-half-of-gen-z-avoid-pirate-content-137705.htm.; See also Jakarta Post. "No More Fakes, Say Indonesian Gen Z Consumers." The Jakarta Post, and the International Trademark Association's Gen Z Insights: Brands and Counterfeit Products Study published May 2019. ©2019 INTA. All rights reserved. 17 June 2019, www.thejakartapost.com/life/2019/06/17/no-more-fakes-say-indonesian-gen-z-consumers.html.

It is interesting to note that many IPOs are challenged by legislation that pre-dates the Internet. Evolving into a modern working world will take more than technological change; it also implies the need to consider the policy and legal implications of the fourth industrial revolution to meet future generational expectations.

The IP ecosystem is not immune to the disruption of emerging technologies; it provides an opportunity to redefine how IPOs deliver their services. As the volume of information and data increases in the IPR landscape, IPOs have to consider not only how to evolve and leverage technological capability to meet the exponential growth, but to keep pace with their country's capacity to issue policies to provide protection for such technological development.

Disruptive technologies, such as artificial intelligence (AI), often operate in areas where the regulatory environment is uncertain, and current IPO structures may not readily facilitate their deployment. Moreover, technologies are becoming increasingly interdisciplinary in nature and do not readily fit into the present IPO classification schemes. In fact, one indication of a truly disruptive technology is one that challenges and works outside or between IPO classification structures.

Emerging technologies also have the potential to create efficiencies for both IPOs and stakeholders of IPO systems. For instance, there are opportunities for easier filing of applications as more sophisticated digital capability enables accessibility through personal devices. Enhanced use of technology creates opportunities to connect global IPOs through collaborative platforms. Searching, granting, and managing IPRs using AI has the potential to create consistency and higher quality outcomes. The list of opportunities is endless; however, the slower policy and legislative environments create challenges to progress. Policy and legislation must keep pace in this fast-changing environment for society to truly reap the benefits of the technological advancements. As machines become more sophisticated and move to more predictive analysis, they will be able to implement simple decision points previously made by humans. This will be a game changer for IPOs and rights owners in the future, for the reasons discussed below.

The World Intellectual Property Organization ("WIPO") has a list of AI initiatives⁷ supported by its member states that demonstrates that IP offices are pursuing AI strategies to advance their processing and data mining capabilities. According to that list, primary uses of AI by IPOs include assisting in translations, stakeholder trademark database searches, patentability examination searches and automatic patent classification. As these new technologies mature, we may expect to see a shift in the practices of the IPO of the Future.

Blockchain technology is another area with potential challenges and opportunities. In addition to being a crypto currency platform, it has been deployed in some countries to ensure the integrity of government records, including applications to capture voter information; collect personal and corporate taxes; identify recipients of healthcare, financial support, and other public services; issue passports and visas; maintain a registry of stock issuances and transfers; register land titles and record property transactions; store marriage, birth, and death certificates; or verify and transfer digital assets between government agencies including federal funds, licenses, and personnel data. Distributed ledgers may also provide avenues to engage and support IPR ownership. To date, blockchain has only been used for copyright and small trademark pilots to track ownership to an authenticated register. Expanding on these current uses, IPOs could create a viable case for using blockchain to manage IP ownership, assignments, renewals, and tracking, with the potential to increase transparency in relation to ownership and transfers of IPRs particularly in the trademark and design environments, and even for trade secrets. Recently, WIPO has extolled some of the benefits of blockchain for IP law and practice,⁸ including registration of IPRs, evidence of creatorship, priority certifications, digital rights management, and enforcement of IPRs.

⁷ "Artificial Intelligence and Intellectual Property," Artificial Intelligence and IP, www.wipo.int/about-ip/en/artificial_intelligence/.

⁸ Clark, Brigit. "Blockchain and IP Law: A Match Made in Crypto Heaven?" WIPO, Baker McKenzie, Feb. 2018, www.wipo.int/wipo_magazine/en/2018/01/article_0005.html.

There are also opportunities for large corporations that typically rely on annuity firms to replace these firms with blockchain to manage their IP portfolios across various jurisdictions (for recordal of IP ownership assignments and/or maintenance described in the above paragraph). Also, users of the IP system stand to benefit from increased competition and improved accuracy of assignment information, as enabled by the capabilities of blockchain. Alternative applications of blockchain could also arise in the realm of enforcement, in checking the legitimacy of digital content copies and physical products moving through channels of commerce. The IPO of the Future must be cognizant of the impacts of blockchain as there is already a clear trend emerging for innovators to use private blockchain as a means of cryptographically securing the information relating to their invention rather than protecting the IP by way of patents, choosing thereby to create trade secrets over more traditional formal modes of IP protection. (See section 3.2, below, for further discussion of this topic.)

Case Study: Blockchain and Smart IPRs⁹

Some IPOs are already investing in the development of “smart IPRs.” A smart IPR is a digital representation of intellectual property that can be used online to help prevent misuse and malicious behavior such as passing off and counterfeiting. Smart IPRs create a connection between IPR holders using an official IPO’s rights register and digital or online services or products that use the rights. Smart IPRs can create a thread of information referring to owners’ IP, including where it has been used digitally, validating who the official owner is, and providing bibliographic data.

So far, some stakeholder feedback from pilot programs that have rolled out smart IPRs highlight the need for IPR holders to prove their authority as the true owner of an IPR in a way that is interoperable in a continually evolving ecosystem.

Other opportunities to use blockchain that are currently being explored, include creating a “smart” system for trademarks using blockchain immutable recording and cryptography to prove the link between an IPR and a product via an identifier, i.e., a barcode, a global ID, or a digital address (domain). This can then be integrated into a product via an IOT device or used in a digital space via a trust badge embedded into a domain and then verified by the API bridge connecting to the smart trademark. The use of blockchain allows the creation of an undisputed audit trail that will enable stakeholders, including consumers to view the historical state of each smart trademark and its network.

(ii) Globalization and Demand for IPRs

The United Nations Educational, Scientific and Cultural Organization (UNESCO) provides several definitions of ‘globalization’ including that “[it] refers to all those processes by which the peoples of the world are incorporated into a single world society, global society.”¹⁰ A challenge for IPOs is to understand and anticipate the needs of the global society. While globalization is not a new phenomenon, it has been accelerated by digital technologies and the Internet, which has dramatically expanded the scope of the traditional marketplace. As businesses increasingly look to file for IP protection outside of their home countries and in multiple offices, IPOs are considering more international engagement to better harmonize IP systems and provide a predictable and level global playing field.

Digital technologies and the Internet have enabled businesses and consumers to access new markets. While there is an increase in globalization, this is sometimes countered by an increased desire for national protection and a domestic focus. The IPO of the Future will need to understand and support the balance between being globally engaged and providing quality local support.

(iii) Harmonization and Domestic Support

Globalization is ushering in a truly digital economy fueling harmonization efforts. The territorial nature of IP may present challenges to traders who operate in a global marketplace. Stakeholders of an international IP system will benefit from clear and consistent office practices and regulations to build their understanding and confidence in the international IP system. Additionally, national IPOs need to complement a stronger level of IP protection certainty with timely, high-quality, and affordable results. If obtaining and enforcing an IPR overseas is too confusing, expensive, uncertain, or slow, then stakeholders may resort to forum shopping or private rights systems, or they may opt to forgo registration altogether and take their chances in the market.

⁹ <https://www.csiro.au/showcase/ai>

¹⁰ Martin Albrow and Elizabeth King, ‘Globalisation, Knowledge and Society: Readings from International Sociology’, SAGE Publications, UK (1990), p 9.

Over the last century, formal and informal, multilateral and bilateral discussions between IPOs have been efficient tools to negotiate new rules for the mutual benefit of offices and ultimately their stakeholders. One example is the World Trade Organization's Agreement on Trade-Related Aspects of IP Rights ("TRIPS"), resulting from cooperation anchored by the World Intellectual Property Organization ("WIPO"). Subsequently TRIPS itself has led to multiple committees and harmonized IP treaties. These efforts have led to technical and technological (procedural) harmonization of the IPOs, which changes how IPOs operate and illustrates the importance of seeking further harmonization. Notably, substantive law and thereby substantive harmonization is not within the purview of IPOs in all jurisdictions, which provides unique challenges for those operating within them. Even when harmonization is handled within the IPOs, it is difficult to achieve, for example, where policy and legislation differ from jurisdiction to jurisdiction and thereby creates jurisdictional conflict (such as on geographical indications) and there is no sign that it will become any less difficult in the next 10–20 years.

Countries are also joining international IP treaties to facilitate international competitiveness and trade by harmonizing domestic IP administrative procedures and formalities with international norms. This ensures that businesses operating in multiple jurisdictions have greater certainty and predictability with the IP system. For instance, for 50 years, the Patent Cooperation Treaty (PCT) has steadily grown and is now WIPO's largest international IP filing system¹¹ and a preferred filing route for applicants seeking patent protection in foreign jurisdictions.

However, there is a concurrent trend whereby countries become more inwardly focused, taking actions to protect jobs and their sovereign rights, which involves the slowing of the creation and/or development of regional and multilateral treaties. We have observed an increasing trend for protracted negotiations in bilateral/multilateral agreements with strong IP or TRIPS plus provisions as parties seek to protect their own offensive/defensive interests. Bilateral agreements are becoming more prevalent. While bilateral agreements can move harmonization forward via the standardization of certain IP requirements, they also pose a potential risk against greater harmonization in the future through specific requirements being carved out between two or more countries. The large number of bilateral agreements on IP has brought with it another level of complexity, with varying requirements and standards that can be difficult to manage, or that are possibly even conflicting. It is important that any bilateral agreement include a strong IP chapter. For any bilateral agreement that includes an IP chapter, IPOs need to be able to actively participate in the treaty negotiations and provide support with input based on their knowledge and experience.

As technologies, business models, and stakeholders become more complex, there is a push for IPOs around the world to continue their efforts against work duplication through the specialization of service functions by, for example, cooperating with other IPOs to develop a technical global IP infrastructure that can be used to share work, data, and knowledge and can help to build more respect for IP globally. In addition to technological solutions, many countries participate in the Patent Prosecution Highway, a mutual recognition program that reduces the duplication of work on patent applications filed in multiple jurisdictions.

To assist with global developments and fluctuating demands, the IPO of the Future must become more open and collaborative with other IPOs and relevant organizations. For example, IPOs benefit from sharing data to use current trends to help predict future demands. Additionally, IPOs can use new data technologies to support real time global cooperation through online platforms. This can allow for best-practice exchanges and even informal discussions on pressing issues, potentially smoothing the way for multilateral harmonization that can benefit stakeholders in both developing

¹¹ WIPO IP Facts and Figures 2019, https://www.wipo.int/edocs/pubdocs/en/wipo_pub_943_2019.pdf.

and developed countries. Many IPOs have already started down a path of transformation and are working independently on their solutions, leading to technology and practice inconsistencies between offices. From a user perspective, it is inefficient to use multiple systems and procedures to reach a single global marketplace in the future.

Through cooperative efforts, IPOs should better understand the systems of other countries, while also ensuring that harmonization efforts continue to be in the best interest of their stakeholders. The territorial nature of IP means that the needs of IP-system stakeholders must be considered in relation to the relevant territory as well as in relation to the global society. Ideally, greater collaboration between IPOs will provide a better understanding of each other's domestic considerations resulting in an open exchange of areas of convergence and divergence.

(iv) Quality, Timeliness, and Fees

Increased harmonization creates a more level playing field, while rapidly evolving innovations and technologies create additional complexity in the marketplace, IPOs need to meet more granular IP needs. IPOs need to be aware that IPRs may continue to be in high demand for certain innovations and brands, but others, especially fast-paced digital businesses, may find formal IPRs less suitable.

These other businesses may find the cost of securing and enforcing IPRs in multiple jurisdictions inconvenient and may risk doing business without adequate IP protection. Access to affordable rights is particularly critical for SMEs seeking protection in multiple jurisdictions. However, while IPOs may ensure that fees are reasonable, this does not necessarily mean that legal professionals will follow suit. Low fees need to be coupled with stakeholder-friendly IP registration systems so that applicants can self-file, self-maintain, and/or have a strong understanding of the professional services they require to keep costs low. The IPO of the Future must increasingly focus on the quality and value-add of their services, such as automation technologies, to meet users' specific expectations.

Ensuring IPRs are high quality, meaning that they provide the owner with freedom to operate in the relevant jurisdictions and are backed by strong legislation to provide the owner with options to maintain their rights, is important for all owners, but especially for IPR applicants seeking to do business in a foreign market. For example, businesses using the Madrid System to protect their trademarks internationally are vulnerable to their domestic trademark's registration. As an international registration is often dependent on a domestic registration, if the original, domestic trademark is no longer registered, then the international portfolio of trademarks based on the domestic trademark may cease to be protected, even where there is no relevant problem in the other jurisdictions where protection was obtained.

(v) Surging Volumes, Subsidies, and Distortion of Global Applications

Demand for IPRs is unpredictable but has been on a steady upward growth trend until the recent COVID-19 pandemic. The growing wealthy and brand-aware middle-class are partly the reason for the increasing demand.¹² Increasing awareness of micro, small, and medium enterprises (MSMEs/SMEs) of IPR value may also contribute to such increasing demand. It is not clear whether the surging volume of demand will be sustained considering the current global economic uncertainty, but IPOs need to consider how they can anticipate and accommodate fluctuating demand. There are IPOs that are fiscally autonomous from government funding and support, and practically dependent on revenues from their stakeholders. The viability of such IPOs may be at risk as they are vulnerable to uncertainties and external forces that are beyond their control. Thus, business disruptions brought about by national crises such as natural catastrophes, pandemics, and wars, to name a few, are serious threats to such IPOs' survival.

¹² IP Australia and the Future of Intellectual Property, Australian Government, https://www.ipaustralia.gov.au/sites/default/files/ip_australia_and_the_future_of_intellectual_property.pdf?acsf_files_redirect, Winning the \$3 Trillion Decathlon; Going for Gold in Emerging Markets, McKinsey & Company, https://www.mckinsey.com/~media/mckinsey/business%20functions/strategy%20and%20corporate%20finance/our%20insights/winning%20the%2030%20trillion%20decathlon%20going%20for%20gold%20in%20emerging%20markets/emc_decathlon.ashx

Some governments subsidize applications for IPRs. The policy rationale may be to encourage investors to familiarize themselves with the IP system or to help with funding and free up funds for further research and development. While the rationale may be sensible, some applicants have taken advantage of the policy and have flooded IPO registers with abnormal and poor-quality IP applications and registrations. This may have resulted in a distortion of the volume or quality of IPR applications globally. IPOs rely on past data to help inform future trends and their ability to accommodate future applications. Where this information is based on exploitative use of national policy, then the data may be flawed. IPOs need to be vigilant regarding surging volumes and take measures to maintain the integrity of their registers. They will also need to keep informed of IP policy shifts in other countries so they can forecast how these policies may affect their domestic application numbers.

(vi) Transparency and Bad Faith Filings

Transparency in IP policy and the provision of IPRs will be mandatory if the IPO of the Future is to raise confidence in the IP system. This is particularly important since the overall value for the society of granting monopolies, commercial incentives, and competitive advantages through IPRs to their owners is increasingly being scrutinized. There is also a need to ensure access to certain creative outputs so as to encourage further creative outputs. IPOs will thus benefit from rigorous evidence-based IP policy decisions to strike a balance between private incentives and public interest, and stakeholder-friendly technology allowing applicants to search registers, file applications, and maintain their rights.

All this transparency, however, comes with risk. While bona fide applicants and IPR owners can access IP registers for legitimate purposes, bad-faith filers also have access to the same information. This risk is concentrated in first-to-file jurisdictions. For example, a bad-faith filer becomes aware of a profitable brand in country A. The bad-faith filer can access global IPR registers to determine whether trademarks have been filed in countries B and C. If not, the bad-faith filer can then file an application with the intention to sell the trademark back to the brand owner or to trade off the brand owner's reputation. In a first-to-file system, it may be very difficult for the brand owner to seek a legal remedy against a bad-faith filer who filed first.

One potential option is to consider regional offices that cover a larger region, for example, the ASEAN region or South America. This could build on the experiences and successes of the EPO, EUIPO, and ARIPO. This would allow applicants to file for IPRs in one of these regions and obtain rights in multiple jurisdictions within the region. This would help applicants to secure simultaneous rights helping to deter bad-faith filings within the region. This type of approach would also assist in harmonization efforts as offices within a determined region would need to pursue harmonious measures and develop a regional policy. However, local political environments may be an obstacle to a regional approach. Where regional offices, such as those found in the EU and African region, are not immediately feasible elsewhere in view of political, legal, and/or logistical factors, these regions may wish to seriously consider at the very least, an option for a regional filing system that is more cost efficient to their stakeholders than what is available.

The balance between stakeholder-friendly and transparent systems is essential for stakeholders, but this will need to be supported by legislation to protect them from bad-faith filings. For example, regarding trademarks, some countries have employed a requirement for an intent-to-use within a certain period. This may be through a declaration in a trademark application or a subsequent document or strengthened grounds for rejection or opposition. Providing certainty for stakeholders is critical, however the IPO of the Future needs to understand that certainty will require a multi-layered approach.

(vii) The Rise of Private Rights Systems and Informal IP Protection

With the rise of online shopping, there is skepticism from some brand owners about the benefit of holding legitimate IPRs such as designs and trademarks: third party selling platforms are becoming more prevalent and are difficult to monitor from an enforcement perspective. Copycats and counterfeits

are hard to spot in an overcrowded and fast paced market, causing major frustration to legitimate IPR owners.

Moreover, the advent of online retailers has enabled both legitimate IPR holders and potential infringers to have ready access to a large user base. Some large online retailers have established their own IP policies and procedures to help IPR holders enforce their rights online. Currently, these policies are based on IPRs granted by IPOs. For example, some platforms proactively screen for potentially IP-infringing listings (using new technologies, including image recognition and semantic recognition algorithms, and product knowledge databases), and respond to requests from IPR holders to remove potential infringing listings, effectively creating a private system for policing IP infringement.

Similarly, Amazon polices IPR infringement using platforms such as Brand Registry, which uses text and image-based search capabilities and automated protections that use machine learning to predict and prevent infringements. To be eligible for Brand Registry, brand owners must have a registered trademark—more than 350,000 brands are registered worldwide in Brand Registry.¹³

Amazon has also created a private IPR enforcement system through its pilot, the Utility Patent Neutral Evaluation. This program allows patentees (of US utility patents) to obtain an evaluation of their patent infringement claims against products offered by third party sellers on amazon.com. This is effectively a streamlined arbitration mechanism for deciding on patent infringement complaints where a third party evaluator (whose fee of US \$4,000 is borne by the losing party) is charged with making a yes or no decision about whether the patent covers the relevant product listing. A positive answer leads to the removal of the listing from Amazon.¹⁴

Other online retailers have created private IPR registration systems. Alibaba, for instance, established in 2018 Alibaba Original Design Protection (based on a five-pronged approach of electronic evidence deposit, product debut, original-design filing, complaint handling, and IP commercialization) and aims to protect products embodying original designs first launched on Alibaba's platforms.¹⁵

Collectively, companies like those described above have created a private IP system in which private IPRs are issued and enforced, providing an effective de facto privatization of the legal framework surrounding IPR enforcement, an attractive alternative to SMEs that may find the cost of infringement actions through the “public” legal system to be a deterrent.

These types of systems stand to become even more prevalent because private IPR regimes challenge the speed and effectiveness of IPOs, which may not be able to move as fast as entities in the private sector. Further, to some, private IPRs may appear more attractive since, in the case of global internet retailers in particular, users can register a product or product name once with the hope that product will be protected worldwide. Therefore, in the future, private IPRs granted by companies may supplant the role of IPRs granted by IPOs.

Alongside this, there is increasing interest in and uptake of unregistered methods of IP protection. For example, a 2015 survey of UK business owners found that 65 percent of respondents considered confidentiality agreements important to protecting their IP; this was the most popular method of protection.¹⁶ The use and importance of informal IP protection methods have also increased, as evidenced by an increase in trade secret litigation in the US, together with recent reform of trade secrets legislation in the EU and the US. Taken together, these are indicatives of a climate where the value of official/registered IPRs is under scrutiny from innovators and businesses.

¹³ Amazon Brand Registry, Eligibility requirements, <https://brandservices.amazon.com/eligibility>; Amazon Brand Registry, Progress report, <https://brandservices.amazon.com.au/progressreport>.

¹⁴ Gaston Kroub, American Bar Association, *Amazon in the Age of Arbitration*, https://www.americanbar.org/groups/intellectual_property_law/publications/landslide/2019-20/september-october/arbitration-the-age-amazon/.

¹⁵ WIPO, Advisory Committee on Enforcement, *The role of intermediaries in IP enforcement*, https://www.wipo.int/edocs/mdocs/enforcement/en/wipo_ace_14/wipo_ace_14_11_rev.pdf.

¹⁶ IPO, Intellectual Property Awareness Survey, 2015

In a fast-paced business world and in the face of fierce competition where some IPRs have short-term value in the face of fierce competition, it is understandable that some brand owners will walk away from traditional methods of IP protection. Private companies are already starting to fill a gap in the marketplace through their own IP policies and enforcement strategies.

(viii) Digital Inventions and Innovation

The advent of AI has given rise to a debate about the degree to which the use of AI technologies will affect the granting of IPRs and the IP system more generally. There are many challenges associated with AI inventions in the future patent environment. As AI-based inventions continue to advance, new challenges rise in the IP system relating to the human contributions affecting both inventorship and ownership, and patentability. A fundamental concept of the IP system is to grant IPRs to protect concretion of ideas. This poses many questions relating to whether the current IP framework should be amended to incorporate these AI-based thinking machines and their inventions to be eligible for IPRs. Indeed, at the rate AI is evolving it may get to a point where it is able to think and to invent.

In January 2019, WIPO published an AI-themed edition of its Technology Trends report, which found that 50 percent of all AI patents globally have been published in the last five years. Patent activity in this field grew by 650 percent between 2011 and 2017. Moreover, the growth rates observed in the identified AI-related patent data are higher than the average annual growth rate for patents across all areas of technology, which was 10 percent between 2013 and 2016.

With the reality that AIs will be generating new inventions or new invention leads, the applicability of the traditional patent law requirements and their underlying policies are being challenged, especially with regard to such key considerations as inventorship (can an AI be considered an inventor?), ownership (can ownership be attributed to an AI; if not, then who is the owner—the software developers, the data scientists who provide data to the AI algorithm, hardware developers or another party altogether?), who (or what?) constitutes a person skilled in the art, as well as issues relating to novelty, inventive step/obviousness, state of the art, and disclosure, to name a few.

It is worth noting that the decision in *Thaler v. Comptroller General of Patent TM and ID of UK (2020)*¹⁷, and *Thaler v. Commissioner of USPTO*¹⁸ have resolved to decide against granting inventorship rights to a creativity machine (AI). Neither will the owner of the machine be entitled to any right because he/she did not invent, nor can he/she own by assignment because a machine cannot assign anything.

In the 90s, the Internet prompted many cultural and business changes that influenced the copyright system. Now, WIPO members and observers are studying the potential impact of AI on the IP system including patents and other IP rights. The digital economy continues to grow in importance. Digital inventions have value both in themselves and in facilitating other economic activity. Consequently, it is important that the rules for patentability are consistent, well understood and harmonized across jurisdictions.

While the degree to which the use of AI technologies will affect established IPRs such as patents, trademarks, and copyrights is uncertain, it is critical to ensure that the IP system and the IPO of the Future is well-equipped to support the emergence of transformative technologies. Long established principles of IP laws, such as those defining thresholds of originality and disclosure requirements, may provide built-in means for the IP framework to adapt to new realities, as they have done with other disruptive technologies in the past.

Indeed, AI has permeated the entire world of IP. This includes trademarks and designs with instances such as analyzing novelty, enabling assessments of level of distinctiveness, and enabling trademark comparisons to consider potential conflicts. For instance, WIPO has developed a tool that uses AI to

¹⁷ *Thaler v The Comptroller-General of Patents, Designs and Trade Marks* [2020] EWHC 2412 (Pat).

¹⁸ The UKIPO, USPTO and EPO rejected patent applications that designated an artificial intelligence named DABUS as the inventor. USPTO rejected application No. 16/524,350 on the basis that each inventor must have a name and be an individual. So did the European Patent Office since “the inventor designated in the application has to be a human being, not a machine”.

search through trademark images, enabling results regarding comparisons and whether a proposed trademark is generic to be generated within seconds. In addition, AI is being used to examine audio and visual fingerprints to detect uploaded material that infringes on another's copyright, significantly improving private copyright policing efforts.

AI-based patent application drafting systems have also recently emerged, substituting the work of patent attorneys. These systems have challenges to overcome before they can generate complete and accurate patent specifications, but their current capabilities and the rapid advancement of the technology indicates that this potential is not so far away.

Millions of machine-generated patents could clog the system, impacting genuine innovations as well as competitiveness. On one hand, companies can use computer-generated claims to saturate the technical space around their own patents to prevent competitors from obtaining improvement patents in the same area. On the other hand, companies can also saturate the technical space around their competitors' patents to prevent the competitors from subsequently patenting improvements on the competitors' own inventions.

The challenges discussed above surrounding patenting digital inventions, including AI, may result in digital innovators looking for other ways to protect their ideas and obtaining some monopoly. How will this affect further innovation and the spread of knowledge to public? Is it time to start considering a different type of IPR with different tests for such inventions? Is it time to codify how AI's role is to be viewed in instances of infringement?

(IX) The Importance of Data

As data becomes more important for businesses and our ability to process and manage data grows, so does the demand on IPOs to provide accurate registries, clean data, and curated information. IPOs do, by the nature of their work, collect large amounts of data on applicants, registrations, oppositions, and their own administrative processes. In most countries, there is specific legislation that allows the IPO to publish this data, including personal information, to allow third parties to search registers and find other IP owners. As the number of IPRs and data grows, the IPO of the Future will need to accelerate its offering of data to third parties. It is not enough these days to maintain a simple register without a search tool, as the property register is simply too large for the stakeholders to navigate domestically, let alone across borders.

Good data collection is important but sharing and making data available has become more important as the trend to file applications in multiple jurisdictions continues. Once data is collected, it must be stored, made accessible, analyzed, and managed; however, for many offices this is an additional cost that is not core to the mission of making a national registry directly searchable. Where possible, data should be available for machine-consumption, but this can be expensive to maintain. To accelerate good data collection, analysis and management, one option the IPO of the Future could consider is encouraging filings of applications in machine-readable formats, and thereby allowing AI tools to be applied directly.

Global initiatives have resulted in databases that provide better access to data with functions that vary from collecting patent data to linking data into a centrally accessible platform. WIPO has also been working on common standards for IPOs to provide administrative data. A shared standard would reduce the cost of direct use, but often there are private companies that are active in this space, and there is a clear commercial value to some of these databases.

There is an implicit need to have good documentation and quality statements for the data. The value of intangible assets, including IP data, keeps increasing in many countries. Similarly, business investments over the last 20 years have moved away from tangible and towards intangible investments, including research and development (R&D), branding, design, software, and data. National statistical offices are globally working to incorporate parts of this in the national accounts. Some national accounts

now include R&D, software, copyright content, and exploration data (geophysical, geological and geochemical information and data) as intangible assets. However, work to measure the economic value of intangible assets is ongoing.¹⁹

While it is clear that data is valuable, there is no agreement as to whether it should be protected as an IPR. Notionally, IPRs exist to encourage the creation of more innovation and creativity, and data is foundational to achieving both of these goals. But different jurisdictions have taken very different approaches to handling data and to whether it is protectable as an IPR. For instance, the USA excludes all government-created records from copyright protection, and the U.S. Supreme Court has found that a simple collection of data does not create an IPR protectable by law.²⁰ The EU takes a contrary approach, treating the equivalent data as copyright protected. In the EU, there are explicit additional rights in a collection of data itself under the database directive²¹. For the most part, this protection falls under the various copyright or trade secrecy regimes, and it may be possible to set an ideal end-point for how data should be protectable, or how we might think of 'content' (which is data organized in a particular manner), and the protection of content.

¹⁹ See for example the work of the EU SPINTAN project to collect broad data, <http://www.spintan.net/>.

²⁰ *Feist v. Rural Telephone*, 499 U.S. 340 (1991).

²¹ Directive 96/9EC of the European Parliament and Council of 11 March 1996 on the legal protection of databases.

PART 3.0 The IPO of the Future...*The Features of an Effective IPO in the Future, One that is Built For Purpose, Including Traditional and Nontraditional Roles*

A clear vision for the future will be essential for IPOs to ensure their continued relevance and sustainability. IPOs will need to examine options both within core administrative mandates and beyond traditional roles. Increasingly IPOs will need to work together to address challenges. Based on the findings presented above on how the world has changed and how it will continue to change, this section explores two sets of features to build the IPO of the Future, those within core administrative mandates and those beyond traditional roles.

3.1 The IPO of the Future: Core Administrative Mandates

Over the next 10 to 20 years, IPOs must be prepared to adapt in order to address challenges and make the most of the opportunities that present themselves. IPOs will need to closely evaluate the suitability of their products and services to respond to an increasing number of trademark, patent, copyright and other applications for protection of IP, the increasing complexity of these applications, and the evolving needs of all stakeholders in the IP system. This shift will require IPOs to change their practices and procedures to become more agile and effective as well as more diverse and inclusive. These changes will test the financial resources, financing models, and sustainability of IPOs as the need for investments in people, information technology (“IT”) systems, workplace resources, and other improvements and necessities escalates. These changes will require IPOs to carefully evaluate how best to integrate new tools, increase inclusiveness and access to diverse groups that are currently underserved by or lack access to the IP system or understanding of it, re-train staff, and recruit a new generation of employees with a diverse skillset. In this regard, IPOs can work together to develop solutions and tools that can be shared. These efforts can advantageously serve to further harmonize processes, standards, and tools across regions in an inclusive manner whilst accommodating each IPO’s individual particularities.

(A) HARMONIZATION OF IP LAWS

The ultimate goal of the IPO of the Future will be technical and legal harmonization with other IPOs, which leads to overall positive impacts within the IPOs, on stakeholders, and the public interest at large, including a variety of stakeholders involved in the IP ecosystem. Improvements in each area such as patent application pendency metrics, stakeholder convenience and satisfaction and office quality, diversity and efficiency will be important. “Harmonization by design” must be built into every applicable decision of the IPO of the Future, discussed below, to the benefit of all stakeholders in the IP ecosystem.

Pursuing substantive and procedural harmonization. While harmonization of substantive law is more challenging than procedural harmonization, the IPO of the Future will continuously pursue both, recognizing that each is an important driver of improved quality, improved office efficiency, and increased diversity and inclusion, which in turn aim to create an overall improved stakeholder experience.

Pursuing bottom-up and top-down harmonization. There are two methods with which to achieve either substantive or procedural harmonization. The first is a “bottom-up” approach through the bilateral efforts of individual IPOs, which focuses on increased efficiency and network effects. The second method is a “top-down” approach, which focuses on across the broad adoption of harmonized rules, created by substantial groups of nations, by even larger group of nations. Whichever method is adopted, core benefits that stem from harmonized IPOs flow from decreased costs, increased

efficiency, and increased quality associated with the harmonized IPO processes and regulations. The IPO of the Future will pursue both bottom-up and top-down harmonization, as applicable, which will vary depending on the level of cooperation required to achieve the applicable objectives. The benefits of the harmonization process start with collaboration between IPOs, which must take into account diversity, and accommodate the different levels of development of the various IPOs partaking in the process. Harmonization is a gradual and continually evolving process, and IPOs can move closer to an optimal level through a multi-level process, with varied levels of involvement and effort. Each IPO of the Future will strive to further the process internally, aligning its own systems and tools with bottom-up and top-down inter-office harmonization.

Increasing inter-office collaboration. The IPO of the Future will use inter-office collaboration as a means to develop harmonized working tools and processes, which even if seen as incremental, are important for the continuation of the harmonization process. Inter-office collaboration will be increasingly important as the global economy is likely to become more fragmented. Multilateral forums, such as WIPO, are avenues for IPOs to work closely together. Regional platforms, such as the ASEAN Working Group on IP Cooperation, are also useful.

Pursuing harmonization in all possible areas. IPOs in this process will need to adopt roles beyond their traditional functions and be engaged in a range of activities that are further discussed in Section 3.2, below. Some examples include harmonization of: (i) IT systems and processes; (ii) data structures and the like; (iii) data files for ease of exchange and cross-use; (iv) trademark, design, patent, copyright application formats and of the information requested in those documents; (v) the many documents submitted during IP application processes; and (vi) timelines. In short, everything that can be harmonized should be harmonized, and the IPO of the Future will pursue this effort with a recognition that harmonization at all levels leads to efficiency, improved quality, integration, diversity, and reduced costs.

Pursuing harmonization unilaterally. Beyond collaboration to achieve harmonization, the IPO of the Future will take voluntary unilateral steps to facilitate future IPO harmonization. This will include actions it takes, and actions it avoids taking. The IPO of the Future will adopt open interfaces and will publish them openly. When setting up new processes and procedures it will look to international norms and proven best-practices through tested data analysis so that other offices in the future will be able to seamlessly work with its new processes and procedures. And it will avoid adopting highly proprietary, customized, unusual practices or procedures that will be difficult for other offices to work with.

(B) OPTIMAL PENDENCY

Considering all factors for optimal pendency. Certain businesses and fields require more time than others for adequate review by an IPO and grant of IPRs. Whether the IPR at play is a trademark, patent, design, copyright, or some other related right, the decision and process to obtain it from an IPO is influenced by many legal, business, and technological factors, including the complexity of the application process and the applicant's envisioned business strategies. For example, a business in the pharmaceutical sector will require more time than one in packaged goods. Optimal pendency should not only be tied to the timeline of the application review but should mainly be driven by the quality of the review, which triggers other private and public considerations. Furthermore, business cultures vary around the world leading to different expectations regarding examination timelines. Applicants' needs will vary. For instance, some patent applicants will prefer expedited examination processes while others will prefer a longer exam time to gain insight into the commercial landscape while the pending designation of an application in itself provides sufficient clout. By the same token, a good faith third party (such as a competitor) may have a legitimate need to precipitate examination of another party's application.

Balancing optimal pendency with quality and free competition. In all cases, the issue of backlog, no matter the applicant's timeline, is at odds with achieving optimal pendency and recognizing the wide diversity of applicants and the public's processing time requirements. The IPO of the Future will develop the dexterity to reasonably accommodate these timing needs, but always with an eye toward protecting the best interests of the public and the system at large by ensuring that applicants are not permitted to sit on rights unreasonably. Quality of examination is paramount as an IP grant decision does not merely affect the applicant but has repercussions for the society as a whole as IPOs balance the impetus for free competition against the need to incentivize innovation through grants of exclusive rights. Therefore, the primary focus of the IPO examination process must always be on providing a quality review. Neither expediency nor delay should detract from this goal.

Focusing on the outcome above all. Standards and norms as to patent and trademark application processing times are extremely difficult to pinpoint due to the need to consider various factors and to find balance in achieving optimal pendency (described above), and the un-harmonized nature of processes across IPOs generally. Whereas some IPOs offer extremely expedited processing to applicants seeking immediate certainty as to protection, others may require many months or years for examination of any application or registration due to the sheer volume of applications continuously pitted against their limited resources. Further, application pendency in developing countries can be hindered by the relatively high filing fees when compared to average income levels, prompting local applicants to opt for strategies that delay the payment of fees and thus also delay the granting of rights. And while the majority of applications proclaim no urgency, fast processing can be critical to applicants across the board for business and technology reasons. Fast processing can be unimportant at the beginning of the application process, but can become important as a result of external events occurring while an application is pending. Alternatively, the opposite may occur. And, finally, processing time in an office of second or subsequent examination can become an issue. All these factors feed into timing considerations, but rather than focusing on a number, IPOs should focus on the outcome tied to the timeline. It is important for IPOs to impress upon their political leaders that high quality review may require more time; however, the overriding objective must remain examination quality when deciding on the rights to be granted. Hence, the focus must remain on "optimal" pendency, which is not a single rigid number but rather a scale, achieved through flexibility and technology-specific tailoring.

Providing options to stakeholders. To facilitate optimal introduction of products and services into the marketplace, and with them optimal economic growth, the IPO of the Future must be prepared to meet the myriad timing needs of its stakeholders. As such, the IPO of the Future will pay more attention to patent application pendency metrics and to the associated needs of applicants and good faith third parties. It will provide as many on-ramps to accelerated handling as reasonably possible, and as many off-ramps from accelerated processing as well. It will provide these options for as many of its processes as possible. It will provide such options where it is the office of first filing, and where it is the office of second or subsequent filing. Regarding the latter two of these scenarios, the fast-track examination in a second patent office following a final ruling in a first patent office via the Patent Prosecution Highway ("PPH") will be one of the standard tools used by the IPO of the Future. As multi-country filings continue to grow, and with recognition of the substantial quality enhancement and efficiency accompanying use of PPH, the IPO of the Future will be alert to opportunities to streamline requests for a second or third filing and will not redo the same work completed by the IPO of first filing. Pendency times will benefit accordingly.

Integrating new technologies for speed and efficiency. The IPO of the Future will also be quick to adopt new technologies that can assist with accelerating application processing without the risk of impacting quality. Such tools can be applied to conflicting trademark searches and the prior art searches performed in processing every trademark and patent application. While AI is the most often-discussed technology opportunity in this area, the IPO of the Future will also continuously evaluate other, more mundane, opportunities for streamlining, which exist in any complex context. It is important

to note that AI will play an increasingly important role in the IPO of the Future and should be immediately assimilated into its workflow. AI technology will serve to relieve tension between time efficiency and quality, liberating resources to be applied to other work streams. Beyond integrating new technologies for speed and efficiency, the IPO of the Future will continuously give consideration to maintaining quality and security. This balancing exercise depends partially on the implemented technology; for example, by using AI, the IPO of the Future may gain speed without sacrificing quality. Or a blockchain solution may provide an efficiency gain and a security gain at the same time. For instance, blockchain can be used as an IP registry, allowing IP owners to keep digital certificates of their IP while maintaining the security of the information. This will allow for both added ease of registration and filing updates and will free up additional resources. With more nuanced, sophisticated, and complex technology choices available as time goes on, the IPO of the Future will have a best-of-breed IT capability that is relentless in seeking out, understanding, testing, piloting, and deploying new technology solutions that can improve pendency as well as quality and efficiency.

(C) EVALUATING, DEPLOYING AND MANAGING NEW TECHNOLOGIES TO ADAPT SERVICES

Taking smart risks. While investing in new IT for IPOs may be perceived as risky, the IPO of the Future will take on that challenge smartly through investments in state-of-the-art work tools for its staff and cutting-edge services for its stakeholders, some of whom may be disabled and therefore require assistance. Serving the needs of this constituency will require an eye to inclusiveness, whether that means supplying hearing aids, visual aids or other aids. The world has become technology dependent, and there is every indication that it will become even more so in the future. Much of this technology will be deployed through software. The IPO of the Future will embrace this trend, and indeed will participate in leading it. Recognizing that IT is complicated, and not all new IT deployments will work as planned or work the first time, it will be essential for the IPO of the Future to attract and retain the very best IT talent, train them exceptionally well to take smart risks, support that talent in continuous experimentation, engage in iterative pilots and focus groups, and keep stakeholders informed so that unsuccessful efforts are seen as learning experiences rather than failures.

Developing shared tools. It will be of equal importance for the IPO of the Future to develop shared tools for co-deployment with other IPOs that have similar priorities and that face similar challenges. This can be accomplished through open source software and by sharing code through platforms such as GitHub or other code repositories that allow other IPOs globally to benefit from and participate in collaborative work. Participating IPOs may then open and edit code as needed while publishing the code they create. The IPO of the Future will collaborate multilaterally through coalitions with other IPOs, as well as through WIPO and its committees that focus on building effective global IT systems, while simultaneously recognizing the challenges other countries may face when adopting new technologies.

Embracing change. Although perhaps not all-encompassing, new technologies such as blockchain can support or even supplant services that IPOs currently perform such as registering and monitoring IP while also reducing the work of IPOs through automation. Such new technologies can lead to reduced overall costs borne by the IPOs to perform their functions. Where support is achieved, the overall IP system will be reinforced. Where supplantation of some IPO services results, there may be significant changes, even reductions in the scope of an IPO's functions. The IPO of the Future will not fight change, nor will it fight the prospect of a more effective means of protection changing—even reducing—its role. The IPO of the Future will embrace all of these events, champion them, and adapt its own services to compete or fill new needs. For example, with the use of technologies such as blockchain, IPOs can heighten their awareness of data usage, and develop clear mandates for capturing, managing, and publishing data.

Investing in mobile computing. Few new technologies have proven as sweeping, empowering, democratizing, or efficiency-enhancing as mobile computing. Mobile computing serves as the vehicle for inclusiveness, enabling connection to IPOs from remote locations previously difficult to reach,

and providing applicants with the ability to reach IPOs without traveling physically. Moreover, with the arrival of 5G, the IPO of the Future will devote even more attention to mobile technologies as a means to facilitate the business cycles of emerging entrepreneurs through the use of mobile applications and camera functions as a method of transferring information. The next generation of innovators is accustomed to interacting with apps to accomplish complex tasks quickly. They will not tolerate rigid forms forced upon them by IPOs operating in bygone paradigms.

Equally as important, diverse communities of innovators coming forward in developing countries, and other groups currently under-represented in their use of the IP system, may well not have access to the old-fashioned fixed computing tools required to interface with current-day IPO IT systems; however, they do have access to mobile devices. The IPO of the Future will readily task itself with the responsibility of meeting these important new stakeholders “where they live”—that is, where the stakeholders live. A strong emphasis on mobile computing will be needed to accomplish this mandate. Speed, convenience, and mobility, will be the watchwords for the IPO of the Future. Mobile computing will also facilitate the IPO of the Future in disseminating information efficiently. It should therefore be a mandated focus for IPOs to make IP publications more accessible and better indexed for review. Better indexing of IP publications will lead to higher quality disclosures, which is a real opportunity for IPOs. AI technologies can also be employed to assess IPO performance and assist in finding bottlenecks in processes that, once addressed, will aid in creating efficient and cost effective IPO systems to better serve the public.

Simplifying services and rules for the sake of stakeholders. Today’s technology is more complex than it has been in the past, making it more complex for stakeholders to interact with and more complex to evaluate. The IPO of the Future will be called upon to simplify its IT (rules, interfaces and access) from the stakeholder’s perspective, despite the escalating technological intricacy beneath. Richness of function no longer defines a successful IT deployment; usability does. The IPO of the Future will recognize this and will exemplify user-friendly IT deployment. The complexity in evaluation will lead to ever more complex IP applications. The use of AI in the invention process is one example. The use of software in drug development is another. One common thread across escalating complexity in innovation is its multi-disciplinary and inter-disciplinary nature. The IPO of the Future will be prepared to address these issues of complexity—automated decision making and cross-disciplinary invention—with flexible and adaptive search and examination processes that bring the right skills to bear even where no single staff member possesses all of those skills. Team examination will be embraced and expanded by the IPO of the Future. The IPO of the Future will also remain open to reengineering or reconfiguring its processes to create modernized services and efficiencies.

The IPO of the Future will also take proactive steps to ensure that its legislative framework is robust and flexible enough to accommodate emerging technologies and the challenges that come with them.

Investing in cybersecurity. Cybersecurity in IPOs is likely to emerge as a major topic for the IPO of the Future. The growth in importance of IP as a competitive differentiator, coupled with the heightened benefits associated with a time-to-market advantage, makes IPOs increasingly attractive targets for hackers as confidential IP information becomes increasingly accessible due to changing work environments and the propensity of both startups and established companies to offer work-from-home opportunities. The IPO of the Future must confront this unfortunate reality aggressively and proactively, working hard to attract top level cybersecurity talent and stay ahead of predators in the same way best-of-breed companies do. Topics and methods such as this also benefit from harmonized approaches, which provide an opportunity for WIPO to play a role in helping all IPOs of the future to stay cyber secure. With a harmonized approach, the IPO of the Future can be governed by an international system that constantly seeks to improve procedures, systems, platforms, databases, and classifications. In conjunction with multilateral action at the WIPO level, IPOs of the Future will pursue aligned information and communication technology strategies globally, which will include identifying areas of collaboration as well as areas where the costs of emerging technologies can be shared.

(D) HUMAN RESOURCES

Proactively anticipating the impact on human resources ('HR') in the mid- and long terms.

The IPO of the Future will hire and train talent with cognizance of the criticality of HR. The HR needs of the IPO of the Future will be different than those of today. New skills will be needed; some of the skills needed today will be adapted; and automation will free workers to focus on more intellectually intensive tasks. This new skill set requirement, coupled with automation will create significant variation between IPOs based on each IPO's level of technological adoption. While some IPO staff may adapt to these new competency requirements, all IPOs can expect roles and responsibilities to evolve. The IPO of the Future will need to be more sophisticated in its workforce planning practices along with being proactive and future-thinking in anticipating these changes, which may well be larger in scope and intensity than in the past or present. Demand modelling and workforce implications will be significant investments and will require careful consideration so as to understand and openly assess its mid- to long-term workload, and, by extension, HR operating models.

Identifying new employment opportunities. Today, trademark examiners, patent examiners, and many other staff members in IPOs are public servants with full-time, life-long (or, at least, long term) employment. The IPO of the Future will embrace the introduction of new technologies, recognizing that some will cause workforce changes, creating new opportunities for workers even as previous work becomes automated. Technology-driven automation has already disrupted workplaces for some time, IPOs can and should step ahead of such changes and emerge well-equipped to help employees tackle them. The IPO of the Future will not seek to slow or impede these long-term, systemic changes in the nature of work, but rather will realize that technology disruptions will simultaneously lead to increased efficiency, harmonization, and new employment opportunities. By the same token, new employment models such as term employment and gig hires must be introduced on a proactive basis, and hiring models may change to enable the IPO of the Future to hire at levels that will be sustainable even as IPO needs change and indeed as the nature of work itself changes. Nearly all private sector employment has changed substantially in the past generation, and continues to move rapidly to more flexible, shorter term employment models. The IPO of the Future will find ways to adapt its employment practices to the world in which it operates. This transition represents a golden opportunity for the IPO of the Future to employ private sector practices to ensure currency with the latest technology and provide best-of-breed services that create deeper connectivity to stakeholders (see 3.2. Chart) and ensure the IPO's ability to undertake increasingly critical roles such as advising stakeholders on business considerations related to their use of IP and how their IP can impact business or regulatory decisions. These new opportunities and new stakeholder needs create demand for new staff competencies and leeway to transition from legacy job roles to modern AI and IT embracing roles. In summary, the IPO of the Future will implement new employment practices akin to those already in use by the private sector, aligning itself with market standards along the way.

Adapting skills and services. Of course, changing technology does not necessarily mean there must be disruptions in IPO workforces; indeed the number of staff may increase to address the new environment. The public will likely have many ongoing needs for IPO services—to examine trademark and patent applications, to test the validity of granted rights, to provide public notice of rights, etc. While existing work tasks may be reduced through the adoption of new technologies, new requirements will inevitably come into being, creating demand for new skills and opportunities for new jobs. So the onset of new technologies will be seen by the IPO of the Future not so much as a threat, but as an opportunity for job retraining and transfer as well as expansion of services.²²

²² A study from the Organisation for Economic Cooperation and Development revealed that about 50 percent of jobs will be impacted by digital transformation in the coming years.

Focusing on its value-add. IPOs are unlikely to have less aggregate work in the future; a general inclusive trend in the works IPOs are likely to undertake will see to this. Of course, there are alternative outcomes as to what may happen when digital transformation affects IPOs in various countries and the IPO of the Future must be prepared for any eventuality. Whatever path it takes, the IPO of the Future will honestly evaluate and focus on what it does best, whether that is to examine IP applications, or support IP policy, or educate citizens who are otherwise IP-unaware. It is through maintaining its value-add that the IPO of the Future will maintain and develop efficiencies and maintain funding for its evolving mission.

Adapting staff training. The IPO of the Future will employ the same HR development practices used by best-of-breed businesses: effective training strategies, including streamlining lengthy training processes for onboarding new staff members, to work with the private sector and new skills-development approaches to continuously update the training of staff members such as examiners working at the cutting edge of technology, and retraining staff members as skills requirements change. Investments in retraining workers will need to pivot to the in-demand fields of the future: data, economic analysis, and cybersecurity. Training for multidisciplinary skills will be in extremely high demand. The IPO of the Future will be laser-focused on the training, enablement, encouragement, and championing of staff members to continuously broaden their skillsets towards higher value work, such as becoming broader multidisciplinary IPOs engaged in examination, oppositions/hearings, and policy. It will at the same time encourage private sector stakeholders to join with it to foster greater inclusiveness among under-represented groups. These new HR development disciplines will be reflected in all facets of IPO operations, from the recruitment process onward, and will flow through all IPO training strategies.

Training other stakeholders. Reaching beyond its own walls, the IPO of the Future will take advantage of new technologies to develop value-added services for stakeholders, a group that includes independent innovators and under-represented groups and persons who otherwise may not have access to the IP system. The IPO of the Future will be prepared to change roles and potentially cede or mutualize tasks in order to maintain efficiency, currency, and relevance. While allowing the private sector to provide as much training as possible in the first instance, the IPO of the Future will continue to play a role in providing training on new IPO developments and practices, as well as on topics not covered by private sector training. All training will take advantage of technology that is relevant to applicable stakeholders, including apps, video content, and beyond.

(E) FINANCIAL RESOURCES AND STEWARDSHIP

Focusing on financial autonomy and sustainability. As is the case today, IPOs of the Future will confront diverse scenarios regarding financial autonomy. Some will remain, as they are today, financially autonomous, with substantial control over the fees they charge to fund the services they provide. However, in many countries, IPOs are not financially autonomous today, relying instead on allocations from a more general government treasury to fund their operations, and/or lacking the authority to set and retain the fees they collect.

While recognizing the difficulties in achieving financial autonomy, the IPO of the Future will consider it a best practice, as financial autonomy enables the IPO to rapidly respond to evolving markets

and stakeholder demands, to marshal its resources for the long term, to adjust fees to account for the costs of performing services, to self-manage operations with confidence, to incentivize positive interactions with stakeholders, and to buffer itself from the politics and variability of funding coming from other organs of government (like when government organizations mandate financially dependent IPOs to collect more fees in order to fund other public policies). The IPO of the Future will also focus on financial sustainability to reduce or eliminate burdens on taxpayers. In fact, we observe anecdotally that, generally, the best practices expressed in this report have been most effectively implemented by either financially autonomous or financially sustainable IPOs. Revolving funds that allow IPOs to adapt

to changes in the market and to confidently make long term infrastructure modernization plans will most likely be a particularly effective tool used by IPOs of the Future.²³

Aiming at maximum financial visibility and predictability. While financial autonomy has much to be said for it, other funding models can be successful as well. Just as IPOs face diverse external environments, diverse backgrounds, and diverse requirements, they will deal with diverse funding models. Some need not be, or simply will not be, financially autonomous, including where financial autonomy could result in the IPO becoming preoccupied with collecting fees to the detriment of its core mission, or where long term investments are required that are beyond the means of the IPO if forced to collect all the required funding itself. While there will be no one-size-fits-all scenario for financing, no matter its funding model, the IPO of the Future will seek buffering from budgetary insecurity and political fluctuations, as well as the funding visibility and predictability required for long term investments and operational confidence.

Ensuring strong and transparent financial management. As the IPOs of the Future choose between different financing models, there is another facet of funding they will wisely heed. Financial autonomy alone is not sufficient to deliver outstanding service to the public, as shown by some of the consistently highest rated and best public agencies for innovation in the world, which are not financially autonomous. Strong management, leadership, and stewardship of resources are other key requirements. Recognizing this, the IPO of the Future will seek sound financial management regardless of financial autonomy. Whatever funding approach is adopted, the IPO of the Future will put in place mechanisms enabling it to weather the up and down cycles of incoming IP applications, to ensure it has enough—not too little or too much—funding to accomplish its mission, to obtain supplemental funding quickly if needed, and to return excess funding as appropriate (including to applicants where they are the source of over-funding). This mandate to obtain supplemental funding and to return excess funding in turn raises the issue of transparency. In a financially autonomous IPO of the Future, future accountability for resources must be a priority. The IPO that succeeds with transparent accounting for its resource usage will enjoy a strongly positive position in its country and the confidence of its stakeholder community.

Investing in economic expertise. New skills will be needed to understand and handle the foregoing, as well as the macro and micro-economics surrounding the IPO of the Future and its role in the larger economy. A key example arises in the area of fees, where a greater awareness of policy issues, an understanding the implications of these issues on fees, and the impact (whether positive or negative) that fees may have on applicants, including their IP, will be needed. The IPO of the Future will create a chief economist office (if it does not already have one) and will seek out best-of-class skills from the private sector and academia to staff this office. The chief economist office will use private sector approaches to advise the IPO of the Future on maximizing the benefits of operating like a financially sound business as opposed to an insular government agency whose resources are drawn on a political basis. Its financial policies and actions from top to bottom will be guided by the global, regional, national, and innovation-ecosystem implications evidenced by the data-driven analysis of its chief economist office. The chief economist office could also be well aware of cross subsidiaries and ensure they are used for related activities, not unlike private companies that must avoid taking advantage of benefits unrelated to their scope of work.

3.2 The IPO of the Future—BEYOND TRADITIONAL ROLES

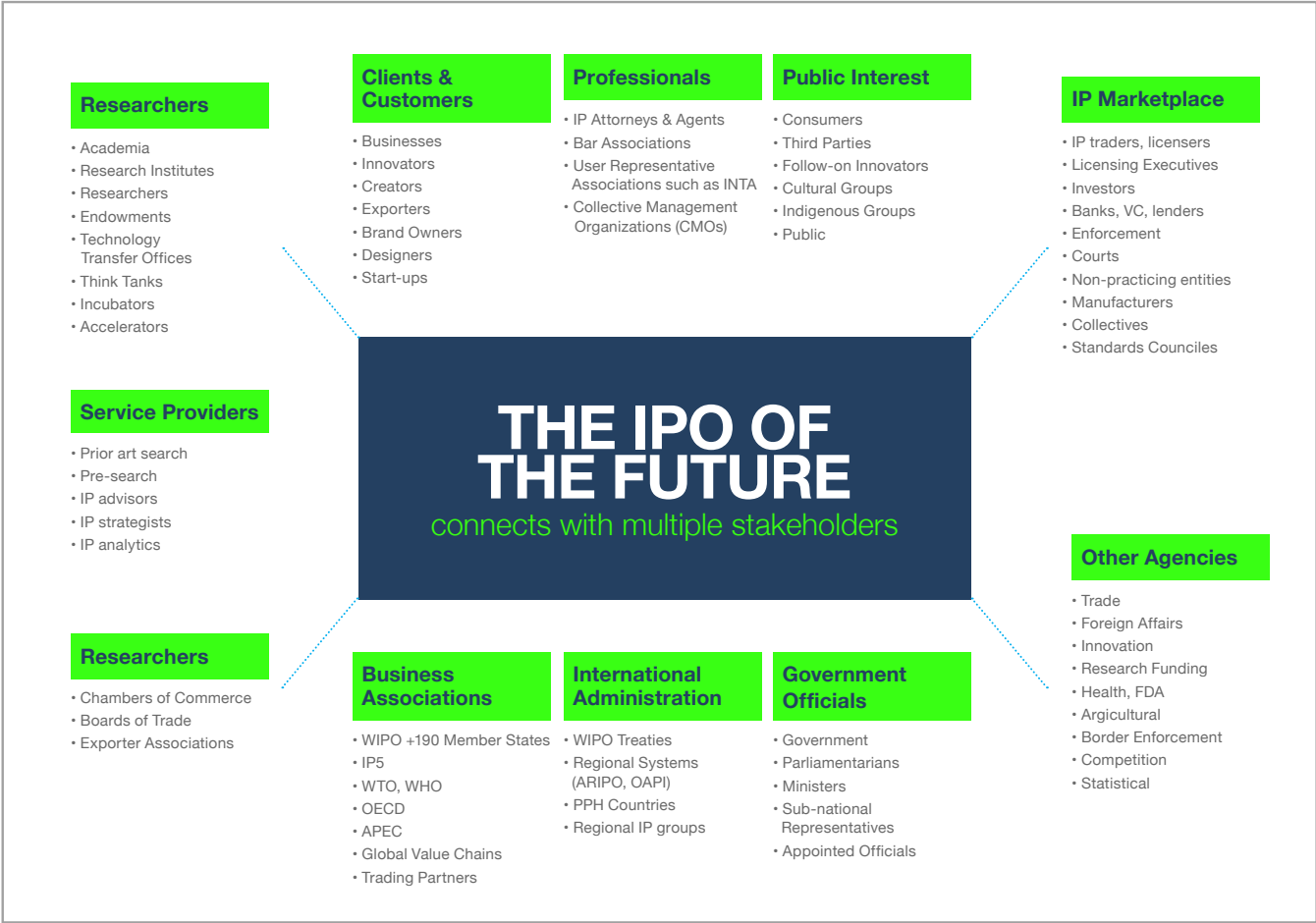
The role of the IPO is evolving with the needs of stakeholders and the increasingly interdisciplinary nature of innovation. The broad adoption of emerging technologies across multiple sectors has resulted in interdisciplinary innovations and new uses of IPRs. In this context, IPOs increasingly play an important role in national IP systems by developing IP policy and supporting the modernization of IP legislation and regulations. This benefits innovators and businesses seeking to access the IP system at

23 United States Patent and Trademark Office. Patent Advisory Committee Annual Report 2013. 4 Nov. 2013, www.uspto.gov/sites/default/files/documents/PPAC_2013_AnnualReport.pdf.

home and abroad. IPOs also play a key role in national innovation ecosystems, such as by supporting the negotiation and implementation of trade agreements and delivering IP education and information to stakeholders. In this regard, IPOs work with stakeholders in the public and private sector to develop and offer stakeholder-centric products and services to address gaps in the market and the needs of underrepresented groups. Similarly, the IPO of the Future may need to look beyond traditional roles to support innovation, modernize IP frameworks, and support the commercialization of IPRs. This section explores ten areas that go beyond an IPO’s traditional role. It is important to note that one size does not fit all for IPOs and that there are a multitude of factors that will be unique to each jurisdiction.

**(F) CONNECTING ACROSS A MULTITUDE OF STAKEHOLDERS
(NOT OPERATING IN A BUBBLE)**

Identifying the network of stakeholder types. There is a multitude of stakeholders in the innovation and IP ecosystem, all of which must work together to support and protect innovation and creativity. The IPO of the Future must be a key collaborator and partner with these stakeholders and must use its unique position in the innovation ecosystem to connect common interests. The graphic below provides insight into these diverse stakeholders:



Balancing interests. The IPO of the Future must have a thorough understanding of these stakeholders to advance areas of common interest. In some instances, some stakeholders may have diametrically opposed interests from others and IPOs must balance these competing interests while also maintaining the public interest. The IPO of the Future, therefore, must be capable of effectively engaging with each stakeholder group to develop a robust IP system and set of services.

Engaging directly with stakeholders. The IPO of the Future will directly engage innovators and SMEs to develop a clearer understanding of their business goals and IP strategies. It is also important

for the IPO of the Future to gather input from those choosing not to seek formal IPRs, and prospective stakeholders yet to apply or who may not be aware of their need to invest in acquiring IPRs.

Protecting the public interest. The IPO of the Future will be responsive to the interest of the public-at-large to ensure it grants timely and quality IPRs and does not grant overbroad or improvident rights. This commitment to optimal pendency and transparency will provide market certainty and maintain the public interest.

Informing researchers. The IPO of the Future will inform researchers of IP filing and technology trends, and publications, and will contribute to on-going research projects. Researchers will also be trained to conduct prior-art and IPR searches and will be provided with data for their own research.

Understanding the IP marketplace. The IP marketplace can provide valuable insights to inform decision making by entrepreneurs and policymakers. The IPO of the Future will seek to understand and track the marketplace, provide information to it, analyze its outputs, and respond appropriately to changing marketplace conditions.

Taking into consideration professionals and professional associations. IP professionals are key interlocutors between IPOs and IPR seekers. In a sense, IPOs and IP professionals jointly deliver IPRs or services to stakeholders. It is important for the IPO of the Future to recognize these interdependencies and to appropriately balance the interests of stakeholders and IP professionals, and that of the public interest.

Seeking input from business associations. Associations provide the voice of general business interests. The IPO of the Future will benefit from their input and support, with the development of targeted IP awareness and education programs, regular exchanges, and multiple channels through which these groups can provide input.

Informing other government agencies. In some jurisdictions, various IP functions are diffused across several agencies, the IPO of the Future will help innovators and creators navigate complex bureaucracies. The IPO of the Future will play an active role in policy development, ensuring that legislative, regulatory, practice, and administrative procedures across multiple agencies are informed by IPO expertise and that these procedures meet stakeholder needs.

Cooperating with foreign interests. The IPO of the Future will build a bridge across domestic IP regimes and will play a central role in collaborating and harmonizing with trading partner jurisdictions to support cross-border IP filings. The IPO of the Future will explore all levels of international collaboration to integrate the patchwork of domestic IP systems, catching up to where businesses are operating, including through: harmonized laws, treaties, trade agreements, regional agreements, regional groups, mutual recognition, work-sharing, alternative working arrangements, MoUs, inter-office collaboration, interoperable tools, and the identification of best practices.

Outsourcing certain activities. As the nature of work evolves and technology advances, the IPO of the Future needs to understand what parts of the IP administrative function could effectively be outsourced to external service providers, freeing up employees to focus on value-added activities. Core examination activities would likely remain internal while administrative activities could be outsourced.

(G) ENSURING QUALITY SERVICES TO STAKEHOLDERS AND INTERNALLY INTEGRATING SERVICES ACROSS MULTIPLE FORMS OF INTELLECTUAL PROPERTY

Offering a one-stop shop approach for one applicant with multiple IPRs. IPRs have traditionally been based on separate rights derived from distinct laws and handled by distinct organizational structures within IPOs. Despite the colocation of these functions within one organization, there remain deeply

entrenched silos. For example, it is very common within an IPO to have a patent office, a trademark office, and an industrial designs office, each operating as a stand-alone office, with the exception of some common corporate services, such as HR or Finance. This structure can be problematic for stakeholders seeking multiple forms of IP as part of their IP bundle to help them get their product to market, because they would be required to apply separately to the IPO's patent office, trademark office, and industrial designs office. An example of this problem arises in instances in which offices have implemented the Trademark Law Treaty ("TLT") but not the Patent Law Treaty ("PLT"). While other parties to the TLT can trust the veracity of member office decisions regarding trademarks, they cannot do the same for patent or design applications, creating significant inefficiencies. Moreover, it is not uncommon for IPOs to see these applications as three separate events, from three separate users. At a minimum, this approach leads to a duplication of effort and an added administrative burden for stakeholders. Equally as important, it represents a loss of opportunity to serve the applicant in an integrated, efficient, and holistic manner and to help the applicant to attain their broader IP strategy. Beyond patents, trademarks, and industrial designs, stakeholders may also seek an IP bundle that includes copyright, geographical indications, plant varieties, as well as non-formal IP such as trade secrets. These functions may span the mandates and administration of several other agencies. To enable marketing success, the IPO of the Future will treat stakeholders seeking multiple IPRs as a single stakeholder who has multiple needs, rather than as multiple stakeholders each with their own needs.

Helping navigate the innovation ecosystem. As various IP functions are diffused across multiple government agencies, the IPO of the Future can also help innovators and creators navigate complex bureaucracies. The IPO of the Future must have an integrated view across administrative mandates, helping stakeholders connect to all applicable agencies to access coordinated and complementary policies and programs. Bridging silos internally and across agencies can support stakeholders broadly, helping them attain formal and informal IPRs.

Assisting other agencies. In many cases, the patent and trademark offices in the IPO have a critical mass of operations, knowledge, and expertise that can assist smaller agencies or those with small IP interests with better understanding IP issues, trends, and considerations. The IPO of the Future also will play an active role in policy development, ensuring that legislative, regulatory, practice, and administrative procedures across multiple agencies are informed by IPO expertise and that these procedures meet stakeholder needs.

Improving the applicant's experience. In addition to a more integrated view across IP types, the IPO of the Future will also seek to modernize the applicant's experience. Excellence in the design and delivery of services promotes confidence in IPOs, and contributes to achieving public policy goals, efficient service delivery, and better service experiences for applicants. Applicants expect effective services that are integrated, consistent, stakeholder-friendly, high quality, and timely. For the IPO of the Future to meet these expectations, the design and delivery of its services must take into account stakeholder input, stakeholder service experience, data stewardship, data security, data integrity, and strong service management practices.

(H) SUPPORTING RESEARCH AND THE INNOVATION ECOSYSTEM

Sharing information and raising awareness of IP. A fundamental purpose of IP is to support innovation and creativity. One way it achieves this goal is by fostering an environment where the knowledge contained in a patent application, once published, is public and available for all to learn and build upon. Another way the IP system supports innovation is by incentivizing innovators to invest in research by granting exclusive rights to resulting inventions for a time-limited period, in the form of a patent. In exchange for this incentive and exclusivity period, applicants must disclose the details of the invention to allow other inventors, researchers, and investors to understand who owns what in the marketplace, to allow for licensing, and to allow innovators to build on the released knowledge with

follow-on innovations. This exchange of rights for the release of knowledge is known as the regulatory bargain. Through the sharing of information and provision of IP awareness and education, the IPO of the Future will continue to live up to its end of the regulatory bargain, fueling research and follow-on innovation, and providing an evidence base for informed decision-making. The IPO of the Future will support innovators by raising awareness to help them understand how to access and use available information in developing their innovation and IP strategies (e.g., prior art searches, IP databases, IP landscapes).

Playing a central role. Given its place in the innovation ecosystem, the IPO of the Future is well positioned to collect and share valuable information. The IPO of the Future will work to better understand the IP Marketplace, after IP is granted, and to bring that information to bear in the administrative process, and ultimately upstream to inform business decision-making. Downstream, the IPO of the Future will share valuable insights and trends in the marketplace to identify gaps.

Acting as a convener. Through its central role, the IPO of the Future will convene stakeholders from across the ecosystem to inform researchers and academics regarding uses of IP, paths toward commercialization, technology transfer, and technology support.

Ensuring sufficient disclosure. The IPO of the Future will continually ensure that information included in IP applications is sufficient to live up to the regulatory bargain.

Sharing IP trends and analytics. The IPO of the Future is well positioned to identify overall IP filing trends, technology specialization, technology concentration, and other insights that are becoming even more valuable with advanced statistical technologies, such as IP analytics. This information can provide valuable insights to decision makers in the IP marketplace.

(I) INCREASING MARKET EFFICIENCY WITH OWNERSHIP INFORMATION

Securing the quality and availability of information on the register. The IPO of the Future has a fundamental role in both granting quality IPRs and identifying clear ownership in order to ensure an efficient and transparent IP marketplace, in turn raising confidence and trust in the marketplace. Current IPO systems for registering and tracking ownership changes in IP are likely not sufficient to ensure an efficient and transparent market. More can be done to ensure the quality of information on the register and to ensure that existing information is readily available. The IPO of the Future will pursue several activities to build transparency and market efficiency.

Providing reliable ownership information to help IP valuation. Without good data and clear information about who the owners of an IPR are, and what the right protects, valuation of any given IPR is near impossible. Usually auctions tend to bundle IPRs, but there is a role for the IPO of the Future to provide transparency about the ownership and scope of the IPR. Since reliable and transparent IP ownership information is critical to support transactions and valuation, the IPO of the Future should consider how to encourage records of change in ownership and licensing.

Supporting trading platforms. In many instances, the marketplace for trading IP is opaque; owners of IP and those seeking IP licensing opportunities may find it difficult to identify one another. The IPO of the Future will support the development and deployment, and encourage the use of IP trading platforms (e.g., IP Marketplace, WIPO Green).

Using technology to improve IP ownership information. The IPO of the Future will support or experiment with the deployment of new technologies, such as blockchain, to create a more efficient, current, and secure ledger of IP ownership to benefit the marketplace and allow it to interact with the IP system.

(J) INCREASING MARKETPLACE PERFORMANCE THROUGH IP VALUATION

Increasingly, businesses must think about IP as an asset and develop strategies for their IP assets that are consistent with their business goals. This type of strategic asset management is commonly referred to as an IP strategy, which enables businesses to more thoughtfully and purposefully acquire, protect, and leverage their portfolio of IP assets. Understanding the value of the underpinning IPRs is crucial to the development and implementation of an IP strategy.

IP valuation is critical for all businesses in the marketplace, and especially for SMEs. IP is one of the many types of assets that a business may hold. It is often at the core of the business value, part of an array of activities such as buying, selling, or transferring IP; IP strategy management; joint ventures and collaboration; license agreements; leveraging or securitizing IP for debt or equity financing; setting initial public offering expectations; determining merger and acquisition terms; managing financial reporting and tax payments; determining damages as part of litigation proceedings; determining, capturing and transferring value during insolvency proceedings; and determining IP insurance value.

Despite the importance of IP as a business asset, companies face many barriers in conducting IP valuation, including lack of valuation expertise; difficulty finding an IP valuation firm; lack of internal capacity; lack of consensus on acceptable methodologies; accounting standards that make it difficult to value intangible assets; cost of conducting valuation; concerns over impartiality or credibility; lack of awareness; and other competing business issues taking precedence over valuation. Because of these barriers, and notwithstanding the increased value of intangibles in companies and the increased importance of valuing them, the value of IP for many companies remains unknown and likely understated.

There have been a number of initiatives to provide valuation of IP assets and insurance for IP assets (especially around litigation). Registers of IPRs have been used as collateral (Australia and Colombia) and several marketplaces exist for the exchange of IP Assets either through private auctions or IPO led exchanges in Denmark, Australia, Canada, and Hong Kong to mention a few.

Filling a gap with caution. IP valuation is best left for IP professionals and valuation firms, rather than for IPOs, for the following reasons: the conflict of interest for IPOs in valuating an IPR that they will potentially grant; the questionable involvement of government so deeply in the marketplace; and the fact that IPOs do not normally have the competencies to conduct complex valuations. However, there are some functions that the IPO of the Future can provide to stakeholders to support IP valuation, especially when and as long as the private sector fails to do so.

Raising Awareness of IP valuation. The IPO of the Future will raise awareness of the importance of having an IP valuation as part of a company's business strategy or a government's development plan, as well as the importance of reviewing this valuation over time as companies grow, countries develop, and marketplaces change. In addition to raising awareness of the importance of IP valuation, the IPO of the Future will emphasize that there are multiple approaches to performing an IP valuation. The IPO of the Future will also better communicate the value of businesses' intangible assets to investors and the market.

Promoting improved accounting standards for business reporting of intangibles. Another important consideration is accounting. Existing rules limit the extent to which intangible assets, including IP, are recognized on companies' balance sheets. Given the sea-change in the value of intangible assets and IP to companies, there is an urgent need to re-examine accounting standards for the business reporting of intangibles. The IPO of the Future can play a role in moving this agenda forward.

Leveraging existing tools. The IPO of the Future will work with stakeholders in the public and private sectors to develop and raise awareness for existing IP valuation resources, experts, and tools.

(K) INCREASING TRUST AND RESPECT FOR IP THROUGH ENFORCEMENT

Trust and confidence in the IP system can be negatively affected by unaddressed infringement. IP enforcement generally remains a private matter between parties, with law enforcement playing a central role only in the criminal enforcement of IPRs. When IPOs grant rights also enforce those rights there is a conflict of interest; therefore, it is appropriate that courts, and not IPOs, should adjudicate infringement matters and penalties. However, IPOs may have a role in supporting their partner agencies such as border security, as part of a “whole of government” approach to enforcement so long as these IPOs do not violate the need for separation of powers between those issuing IPRs and those enforcing them, and that the activities of the IPO do not impede enforcement activities. In other words, any supporting role that IPRs assume must not include actual enforcement or leadership in enforcement of IPRs. However, the IPO of the Future can play a role on the periphery to understand and support confidence in the IP system.

Participating in an IP enforcement coordination center. Some countries have created a central coordination unit to fight against counterfeits, piracy, and other IP crimes. These countries aim to remedy the inefficiencies resulting from multiple national agencies looking at these IP crimes in isolation, without the necessary expertise to tackle the cross-jurisdictional complexities of such crimes. These coordination centers tend to include the different industries affected by these crimes, all governmental officials involved in working to stop them, the IPO, and the targeted public. The IPO of the Future will lead or participate as a member of a national IPR enforcement coordination center or a national anti-counterfeiting body (e.g., the French National Anti-Counterfeiting Committee) or promote its creation. The role of the IPO of the Future will be to exchange information, provide expertise and trainings on IPRs and businesses’ strategies, coordinate between the different governmental offices at the national level, facilitate coordination between national officials and other jurisdictions globally, and remain current about developments.

Acting as an information hub. The IPO of the Future will act as a hub for information exchange across a range of government agencies and private sector interests involved with enforcement.

Undertaking research. As part of broader networks or focused economic research groups (e.g., the EPO Conservatory), the IPO of the Future will undertake economic research and tracking of issues to understand marketplace activities and beyond, such as the impact of counterfeiting.

Raising awareness. The IPO of the Future will provide basic information or point to available resources internationally to raise awareness of the value and importance of respecting IP.

Promoting Alternative Dispute Resolution (ADR). Alternative dispute resolution, especially mediation, is very useful in the sense that it provides parties with more control over the proceedings, and allows them to better maintain important business relationships than traditional dispute resolution methods. The IPOs of the Future can play a role in increasing awareness of ADR, which could be useful for their stakeholders.

(L) RAISING AWARENESS AND PROVIDING EDUCATION ON IP BENEFITS, IN PARTICULAR BENEFITS TO APPLY AND USE IP

Educating businesses, including SMEs. Low awareness of IP can inhibit business growth, scale-up, and entry into global markets. Underutilized IP can translate into lost business opportunities, while fully leveraged IPRs create opportunities for growth and encourage new investments. Fundamentally, it is believed that SMEs, in particular, face key challenges related to understanding the importance of IP as part of their business strategy.

The IPO of the Future will contribute to wider IP awareness and education, and support the development and commercialization of IP, through a range of programs that inform and educate businesses.

There is a particular role for the IPO of the Future in supporting follow-on innovation (fulfilling the original regulatory bargain) and in informing applicants about how to effectively interact with the IPO. The IPO of the Future should raise awareness on IP to all businesses in all sectors, so as to enable innovators and creators to have a basic understanding of IP and empower businesses to make more informed decisions in IP matters.

Upskilling IP professionals. This category includes IP lawyers, trademark and patent agents/attorneys, and IP consultants. These professionals are important “multipliers” and help businesses to maximize the value of their IP. Ideally, IP skills would be adaptable across jurisdictions, given the globalized nature of IP and the economy.

Being mindful of inadvertent cross-subsidization (using resources that were generated for other purposes). It is important to recognize that, in particular for those IPOs that are stakeholder-fee based, care must be taken to avoid inadvertently cross-subsidizing awareness activities using resources generated by and for rights seekers. For some jurisdictions, where there is an identified need for IP awareness, other appropriation mechanisms should be pursued.

Moving forward from the evidence. There is limited evidence on both the baseline of awareness level and the impact of raising awareness on the effective use of IP. Existing measures of awareness levels usually do not identify differences across sectors or internationally, thus raising the question of what the ultimate target for the level of awareness should be.

The IPO of the Future can provide more evidence on the economic importance of IP protection and IP rights. Having more such information would help to communicate the importance of IP to businesses as well as to other government agencies to better inform policy making. To this end, the IPOs of the Future will welcome greater collaboration and sharing of ideas and methodologies amongst themselves.

Demonstrating impact of awareness activities. The IPO of the Future will move beyond the question of baseline and setting targets for awareness levels, by understanding and demonstrating the impact of their awareness activities on outcomes, such as improved economic or innovative performance. As mentioned above, there is very limited evidence of the impact of changing awareness on increasing performance or outcomes, and the available surveys must be interpreted with caution. For example, some surveys rightly find that SMEs who own IP perform higher in terms of growth, exporting, and employment than those who do not. While IP ownership and economic performance are correlated, it is important to note that correlation does not indicate causation. There are a multitude of factors affecting overall economic performance of a company, of which IP knowledge and use are but two. For instance, if a company has poor management, does not invest in skills, does not have growth potential, does not have a sufficient capital base, and does not have a competitive product or service, this company will likely not benefit from awareness or use of IP. Presently, there are a handful of researchers internationally who are working to develop appropriate methodologies and experiments to better assess the impact of IPO awareness activities, and when ready, this may inform how to target activities and identify which types activities are most useful.

Constructing a gap analysis. Until there is clear evidence, the IPO of the Future will work to better understand existing knowledge gaps anecdotally through interviews, focus groups, roundtables, and surveys to identify specific gaps and misunderstandings. From this, the IPO of the Future will develop information and awareness products and services. In constructing a gap analysis, the IPO of the Future will take a lifecycle approach to understanding information barriers that innovators and creators experience, spanning the continuum from basic research, discovery, seeking IP, identifying prior art, interacting with the office and agents/attorneys, and using IP in the marketplace. Each point along this spectrum has different IP information needs for different types of potential beneficiaries of the IP system.

Leveraging existing awareness tools. There are some well-developed information products that jurisdictions have modified for domestic consumption. Some jurisdictions hold seminars on how to file for IP and touch on the value of IP. These types of awareness activities fall squarely within the mandate of IPOs, as they prepare potential applicants to better interface with the IPO in seeking IPRs. A full range of awareness activities and delivery channels are available directly from IPOs or through other stakeholders, including: Massive Open Online Courses; online tools; apps; games; podcasts; IP law clinics; “IP for Dummies”; business and professional associations; pro bono assistance; university courses; IP academies; etc. The IPO of the Future will tap into this extensive network to learn from best practices and leverage resources.

Focusing awareness activities: With limited budgets, IPOs must tailor efforts to address specific gaps that exist in the market, deliberately and strategically targeting sectors, regions and technologies, and leveraging channels available to intermediaries. This will help counter the risk that the awareness is driven more by arbitrary opportunities than by deliberate, targeted efforts.

In some instances, IPOs provide support to certain underrepresented groups, such as indigenous people, women, SMEs, etc., perhaps based on the level of IP filings from specific groups. Market segmentation may be useful if it leads to more effective targeting of awareness activities. The IPO of the Future will also consider specific policies to address the measured gap, such as promoting the use of the IP system and applications by certain identified groups. The level of fee charged for individuals or small entities will also be carefully considered, as there is a believed cost barrier to smaller firms.

Working with partners to reach potential rights-seekers. IPOs do not have the mandate, resources, or capacity to reach all potential IP stakeholders. The IPO of the Future will partner with intermediaries (e.g., universities, business associations, IP professionals) and leverage existing channels to extend the reach of its awareness activities. The IPO of the Future will also train the trainers, to ensure that there is a broader reach to potential innovators and businesses. The IPO of the Future will work with universities to educate future IP specialists.

Filling gaps until the private or non-profit sectors step in. In some instances, a gap may exist that would best fall within the responsibility of the private or non-profit sectors. In this case, the IPO of the Future may act as a catalyst to inform stakeholders of the potential gap, and perhaps experiment or step in to fill the gap until such time as the private sector market builds sufficient capacity. The IPO of the Future will undertake temporary activity with caution, with a predefined exit strategy once private or non-profit sector capacity is established.

Being cautious about providing business or legal advice. There is a spectrum of awareness-building and education to consider, ranging from laissez faire to full market intervention. Actions along this spectrum of intervention include providing: data; information on how to file for IP; trends in IP; filing assistance; business guidance; strategic advice on whether and how to proceed with seeking IP protection; and, effective use of IP in the marketplace (e.g., valuation, transacting IP, enforcement). It is generally agreed that treading into the territory of providing business or legal advice goes beyond what many jurisdictions would consider appropriate, and that the private sector is best placed to provide advisory services. If the IPO of the Future ventures into providing IP strategy or business advice, this activity should not affect whether or not it grants the underlying IPRs. The IPO of the Future will establish strong ethical walls between IP education and the granting of rights to the recipients of that education, to ensure against conflicts of interest.

(M) INFORMING AND SUPPORTING POLICY DEVELOPMENT

Becoming the center of expertise on IP and part of the policymaking process. IP policy development and IP administration must work hand-in-hand to best serve innovators and creators—they cannot operate in isolation. For example, the knowledge gathered by an IPO in the administration of IPRs provides a critical source of information and expertise to further inform and influence IP policy

development. As such, the IPO of the Future will become a center of expertise and an integral part of the policy development process, working proactively with policy-makers to explore improvements to the IP system as the nature of IP evolves with technological change.

The types of insights the IPO of the Future can provide are numerous, including: informing IP stakeholders of the evolution of IP laws and practice; understanding and interpreting economic trends; and informing broader policy development in other marketplace areas. The IPO of the Future will also be central in understanding market trends and how they affect IP activities. This intelligence will provide an important signal for broader innovation policy decisions. Moreover, the IPO of the Future will provide expertise on how IP policy and IPO administration interact with other complex policy areas, such as the convergence of IP, anti-competitive use of IP, standard setting, standard essential patents, industrial policy, and national security.

Creating an evidence base to inform policy development. As interest in IP rises globally, the empirical basis for policy analysis and policymaking becomes more important. The provision of evidence to support policymaking has become cornerstone work for leading IPOs. The IPO of the Future will invest in building on the nascent but growing network of IP economists, as well as experts at WIPO, OECD, and academic and research institutions, to build a robust evidence base, supporting policy development and informing academic and media activities.

Adopting the 2019 Guidelines to Use Evidence from Research to Support Policymaking. As a starting point, the IPO of the Future will adopt the 2019 inaugural guidelines for using research evidence to support policymaking.²⁴ These guidelines for developing an IP evidence base were created by a small group of IPOs with chief economist functions, including: IP Australia, the Canadian Intellectual Property Office, the European Patent Office, the European Union Intellectual Property Office, the Intellectual Property Office of Singapore, the Swiss Federal Institute of Intellectual Property, the United Kingdom Intellectual Property Office, the United States Patent and Trademark Office, and WIPO. The guidelines provide best practices to ensure that the highest possible quality of evidence is used in the decision-making process at IPOs and in government generally. The guidelines elaborate on the best practices in conducting empirical studies in the IP field. In so doing, they seek to improve the credibility of studies, enhance transparency about what conclusions can and cannot be drawn from such studies, and encourage responsible use of studies by IP stakeholders.

(N) ENABLING ARTIFICIAL INTELLIGENCE AND OTHER DISRUPTIVE TECHNOLOGIES

Monitoring disruptive technologies. The IPO of the Future will continually monitor for signals of disruptive technologies and improve its responsiveness to emerging market needs, to establish rights with maximum legal certainty, as quickly as possible.

Adopting a holistic approach. To be prepared for the challenges and opportunities presented by ongoing technological disruption, the IPO of the Future must be agile and able to rapidly adapt to meet user needs and expectations. This requires investment in legislative review, infrastructure,

technology foresight analysis, workforce planning, research and development, and business process reengineering.

Staying Current. The IPO of the Future will remain current through: (i) exchange of expertise with counterpart IPOs; (ii) bringing private sector expertise into the IPO examination process; (iii) crowdsourcing talent or expertise; (iv) using big data and non-traditional search methodologies and tools; and (v) deploying machine learning.

The IPO of the Future will increasingly look to utilize AI to gain efficiencies in the delivery of IP services. WIPO publishes an annual survey of AI initiatives supported by IPOs, showing that primary uses of AI currently include classification, prior art search, data analysis, and process automation.

²⁴ https://www.wipo.int/econ_stat/en/economics/news/2019/news_0004.html

Using data to support AI. Because AI applications learn by analyzing vast amounts of data, data is central to supporting AI implementation. The IPO of the Future will make sure to use its large datasets to provide a mature model for data dissemination. Since the IPO of the Future is a steward of large amounts of administrative data resulting from its IP-granting functions, making these data sets public will provide a useful tool for machine learning.

Anticipating challenges resulting from AI-generated inventions. Commercial AI-generated works and AI-generated inventions may affect the granting of IPRs and the IP system more generally. The IPO of the Future will proactively reflect upon the challenges this will pose to well-established IP concepts, such as the concepts of “author” and “inventor,” and how principles of IP such as those defining thresholds of originality and disclosure requirements can provide built-in means for the IP framework to adapt to new realities, as they have done with other disruptive technologies in the past. The IPO of the Future will foster an exchange with its counterpart IPOs on these important matters and will provide expertise in this area when it comes to policy making.

(O) BECOMING A DATA-DRIVEN OFFICE

Using data purposefully. The IPO of the Future will be data driven and capable of leveraging the full value of data. It will be an early adopter of data-driven digital technologies to benefit its stakeholders. Data has been likened to the “currency of the realm” due to its value in today’s marketplace. Data can reveal insights that allow businesses to make better-informed decisions. It can allow businesses to identify new opportunities for follow-on innovation, collaboration, and licensing. The IPO of the Future will use data to understand its stakeholders and their needs. Such insights can also engender discussions with stakeholders regarding gaps in knowledge and understanding, as well as new products and services that can address those gaps.

Adopting a data strategy and data stewardship. This data-driven approach will require the IPO of the Future to develop an enterprise-wide data strategy, detailing the management of data across the IPO. The IPO of the Future will also continuously ensure that all data collected or otherwise in its custody is used ethically and stored securely, even as the standards for data ethics and security evolve rapidly with changes in societal expectations and security needs. The IPO of the Future will ensure that its data and the uses its data is put to are free from discrimination. The IPO of the Future will have an in-house competency and focus on information protection and privacy, information governance, data quality, accuracy, access, and fairness, and data-life-cycle management, all included in its data strategy.

Balancing interests when managing data. IPOs have a regulatory responsibility to ensure that high quality data is collected and made readily available and discoverable. Access to high quality data is essential for ensuring that researchers, policy makers, and businesses have a clear evidence base from which to make informed decisions. These principles require a focus on data stewardship within the IPO of the Future, supporting the optimized use of data; facilitating data discoverability and accessibility; and helping build and promote data innovation, expertise, skills, and literacy within the organization. The IPO of the Future will ensure that its IP administrative process and regulatory requirements enable the collection of the appropriate amount of information or data to support innovation while balancing the interest and rights of its stakeholders.

Recruiting a Chief Data Officer (CDO). As organizations have recognized the importance of business intelligence, and data management to everyday operations, the role of the Chief Data Officer (CDO) has become more visible and crucial. The IPO of the Future will recruit a CDO and establish a data science center of excellence to leverage the full value of data, which will enable it to make better, fact-based, and more impactful decisions.

The CDO role within the IPO of the Future will include defining strategic priorities for the organization in data systems and opportunities, identifying new business opportunities pertaining to data, optimizing

revenue generation through data, and the general treatment of data as a strategic business asset. With the use of data science and analytics, the CDO will be looked upon as a key strategist and defining the next growth opportunities, product offerings, and markets.

Being an early adopter. The IPO of the Future will consider pilot, beta, and test new technologies. It will integrate new technologies such as AI and blockchain into internal and outward-facing operations to build a high performing, agile organization that is equipped to meet the evolving needs of its stakeholders.

PART IV: CASE STUDY—IPOs Surviving and Thriving Through the COVID Crisis (Applying the IPO of the Future Framework)

The COVID-19 pandemic represents the largest human, societal and economic crisis of our generation. During this time of crisis, a policy question has arisen: *does intellectual property help or hinder humanity through an epidemic?* Beyond this question, there are also fundamental regulatory and administrative questions about the IPO itself, specifically: **(i) What is the role of IPOs throughout the COVID crisis? (ii) Are IPOs resilient and robust enough to survive this shock? (iii) Are there opportunities for IPOs to evolve, or even thrive, in the aftermath of this pandemic?**

The analytical framework established for the IPO of the Future can be used, in part, to explore these questions by providing a structure through which we can examine the real-world responses of IPOs during the COVID pandemic. In this section, we provide a case study to examine how this crisis has affected IPOs' responses in the areas of: (i) core administrative mandates (*harmonization, pendency, technology, human resources, finances, and stewardship*); and (ii) expansion beyond traditional roles (*connecting with stakeholders, becoming data-driven, supporting innovation, improving market efficiency, providing education and awareness, informing policy, and understanding public sentiment*). This examination, in turn, will help provide more clarity about how the IPO of the Future must equip itself to withstand future crises. It is important to note that the analysis below highlights a range of experiences and does not represent one IPO in particular. While some IPOs were effective along many fronts, some IPOs experienced significant setbacks that are yet to be fully understood.

The IPO of the Future—Core Administrative Mandates

1. Harmonization: To respond to the pandemic, individual jurisdictions, responding to unique situations and client needs, have introduced short-term, regulatory approaches and flexibilities, such as blanket extensions of filing and renewal timeline to avoid inadvertent loss of IPRs. Some offices even considered introducing emergency powers that would centralize decision-making. The net result is that these well-intentioned domestic responses may have resulted in an international regulatory patchwork that has increased complexity for IPR seekers applying in multiple jurisdictions. This resulting patchwork also demonstrates the need for increased collaboration and transparency throughout a crisis and the need to maintain sound decision-making. As a step toward increased harmonization, some IPOs have collaborated with WIPO to create a policy tracker to inform applicants about regulatory decisions and changes made over time.

2. Pendency: In the early days of the pandemic, the volume of patent applications remained consistent while the number of trademark applications decreased. Many IPOs were able to maintain operations, but others experienced declines in productivity, and some closed altogether. While operations continued for many, backlogs in certain parts of these organizations increased, requiring forward planning to reduce these backlogs and to eventually return to normal operations. Throughout the crisis, it has been important for IPOs to understand and serve their clients' needs. In some instances, for example, increased pendency has been acceptable to clients as the economy itself slowed down and that understanding has influenced how some IPOs prioritize during this pandemic.

3. New Technologies: Some IPOs faced sudden declarations of emergency measures in their jurisdictions, shutting down cities, transportation routes and offices. While some IPO work could be performed remotely, other elements required physical presence in the IPO. To continue operating, some IPOs underwent an immediate and fundamental retooling of procedures. This required live experimentation and rapid operational evolution using technology, resulting in different ways of organizing work that

may have long-lasting, positive effects. Like most enterprises, the rapidity of technological deployment during the pandemic may have also exposed some organizations to security risks that have yet to be fully understood or mitigated. Some IPOs have implemented various health protocol guidelines and measures in their operations and resorted to almost full online transactions vis-a-vis the public to avoid face-to-face transactions. In the most propitious way, this maximizes the use of technology in lieu of paper transactions that could reduce turnaround time.

4. People and Talent: For many IPOs, the provision of IP products and services throughout the COVID-19 crisis has remained robust, with the overall objective of delivering these services and products while simultaneously protecting the health and safety of IPO staff. Many IPOs were fortunate to have an already well-established teleworking capability, allowing IPO operations to continue without jeopardizing staff well-being. For those IPOs that successfully deployed their workforce remotely, and where staff saw the benefits of working from home, coming out of COVID-19, there will likely be expectations that IPOs consider a more regular use of remote working as a way to serve both staff and operational needs.

5. Finances Resources and Stewardship: As noted earlier, some IPOs are fiscally autonomous from government funding and support, and, in a practical sense, they are dependent on revenues from their stakeholders, whose viability may be at risk and are vulnerable to uncertainties and external forces that are beyond their control. Thus, business disruptions brought about by economic or other crises can directly affect the financial viability of IPOs and their ability to serve their clients.

Maintaining the financial viability of IPOs through an economic downturn has remained top of mind for many IPOs. Financial planning and forecasting have become even more important in understanding how market trends, expected applications, and internal production could maintain revenue sources through the pandemic and thus allow the operational capacity of IPOs to remain viable. Regarding stewardship, like all organizations, IPOs have had to refine, and in some cases develop, new capacities to understand and deploy new approaches to maintaining staff occupational health and safety.

The IPO of the Future—Beyond Traditional Roles

6. Connecting with Stakeholders: International collaboration reached unprecedented levels, where formal and informal networks emerged as colleagues sought to understand the implications of this crisis for IPOs. On a rapid and continual basis, IPOs learned from each other about how to: understand the impacts of the crisis; anticipate resultant economic trends; consider flexibilities that could be afforded to stakeholders; find workarounds to address capacity bottlenecks; experiment with technological solutions; and plan for a return to full capacity in the new normal. Likewise, some IPOs worked closely with stakeholders, IP attorneys, and other intermediaries to understand shifting demand, market trends, and legal questions that have arisen during system-wide disruptions. This level of collaboration strengthened the resolve of all IPOs involved and prepared IPOs to develop appropriate plans and responses.

7. Data-Driven: IPOs with capacity for economic analysis and modelling were able to build on economic forecasts to anticipate IP application trends, ultimately informing operational decision making to allow these IPOs to remain financially robust throughout this pandemic. This required the rapid exchange of data and the use of machine learning technologies to forecast scenarios.

8. Supporting Innovation: IPOs were called upon to understand how their IP data could be used and shared with researchers to develop, deploy, license, or commercialize inventions that could respond to COVID-19. Some IPOs introduced compulsory license provisions for COVID-19-related technologies, while a few provided accelerated examination for similar technologies.

9. Increasing Market Efficiency: IPOs found ways to increase understanding and improve the sharing of information in the marketplace to ensure that companies wishing to retool or pivot production lines to produce medical devices had the ability to do so. This has informed decisions on open source technologies and freedom to operate. In some instances, this information has also provided a counter-point to anti-IP sentiment that was arising by helping the public to understand how intellectual property not only serves the interests of right holders but of the society as a whole.

10. Increased Education and Awareness: Some IPOs with awareness capacity were able to deploy expertise in the field to address issues raised by COVID-19, e.g., freedom to operate, sourcing technologies, or licensing.

11. Informing Policy Development: Some IPOs were uniquely positioned to gather intelligence from the field and leverage their IP expertise to inform government emergency response policies, ensuring continual alignment with evolving government priorities. This alignment with government policies also demonstrates how IP can be critical for making better and more informed policy decisions.

12. Understanding Public Sentiment: Concerns emerged in certain quarters at the beginning of the pandemic, with some questioning whether IP and the IP system would help or hinder a COVID-19 response. So far, collaborative efforts on the part of manufacturers have pivoted production to create much needed personal protective equipment. Scientists, medical professionals, university researchers, and governments are cooperating in attempts to discover and develop a much-needed vaccine. Companies and innovators are stepping up to help address the pandemic, and they see in the IP system an important incentive enabling them to innovate. It is an important pathway towards reliable diagnostics and vaccines for the next pandemic. Protecting IPRs, incentivizing investment in creating them in the first place, properly utilizing the IP system, and helping tailor IP systems to national and international needs are key tools to address COVID-19 as well as future crises. The IPO of the Future must understand and anticipate evolving public sentiment in times of crisis and be connected and innovative enough to step up and serve rapidly evolving situations (in both its core and non-traditional roles).

Conclusion

Returning to the questions posed at the beginning of this section, it would appear that, during the COVID-19 pandemic so far, many IPOs have remained focused on their fundamental mandate to provide IPRs and services. In some instances, non-essential activities, or those that are beyond the traditional roles of IPOs were amongst the first activities curtailed to maintain mandated requirements. However, it is still too early to tell how successfully IPOs will be in weathering the storm and remaining financially viable in the coming years as operations either return to or pivot to whatever their new normal will be. Regarding opportunities to evolve and thrive through the disruption, some forward-thinking IPOs have been able to: step up to support innovators seeking to respond to COVID-19; inform government policies; experiment with technological solutions; leverage data and forecasting; and connect deeply with stakeholders to gather and share intelligence. Necessity has become a driver of innovation within IPOs.

Overall, the framework of analysis provides some indication about how the IPO of the Future must adapt in order to survive, and in some cases thrive, through economic and societal disruptions. In accordance with our recommendations throughout this paper, this case study shows that at a high-level, the IPO of the Future will need to be built for purpose (focusing on its core mandate); robust enough to withstand disruptions (based on sound stewardship); and sufficiently nimble, connected, and innovative so as to step up and serve rapidly evolving situations (both in its core and non-traditional roles).