

Intellectual Property Management by the Government of Israel

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1. Introduction.....	2
2. IP Management in the Israeli Governmental Sector – Case Study.....	2
a. Legal Framework.....	2
i. Background	2
ii. Governmental Initiatives to Define Knowledge Transfer Policy	3
iii. Legislation Proposals.....	3
b. IP management in the Israeli Government Sector – Empirical Research	7
i. Patent Application Analysis - General.....	7
ii. Methodology.....	8
iii. Results	9
iv. Conclusions.....	14
3. Big Data and IP Management in the Government Sector.....	15
a. Big Data and Data Driven Innovation.....	15
b. Government Databases and the Copyright Regime	16
c. The Israeli Case - Initial Reference by Policymakers	17

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1. Introduction

Knowledge transfer between the different research sectors is a common practice in many countries, while the main focus is usually on knowledge transfer from academia to the private industry. This activity is carried out through a wide range of mechanisms, including research results published in academic journals, consulting activities, research and development (R&D) collaborations and scientific parks built on academic campuses.

Alongside these well-established mechanisms, in recent years we have witnessed the expansion of knowledge transfer activity through the commercialization of intellectual property rights (IPR). By means of this legal mechanism abstract knowledge becomes an asset which is then subject to a legal regime that governs ownership rights and regulates the use of these rights, enabling knowledge transfer between the various research sectors through the sale or licensing of IPR.

Use of the intellectual property (IP) mechanism for the transfer of publicly funded knowledge from academia to the private sector raises a wide range of questions regarding the nature and role of the public R&D system, at times reflecting different assumptions regarding the goals of public investment in research and the optimal means to achieve them.

These questions are discussed mainly with respect to the transfer of academic knowledge. However, publicly funded knowledge is not only created in academia but also in governmental research institutes. While knowledge transfer from the academic sector through IPR commercialization has been thoroughly examined in academic literature and various policy documents, knowledge that originates in the governmental sector has not received sufficient attention to date by policymakers and in academic research. This may be both surprising and disconcerting since research conducted in the governmental sector serves as a key tool for promoting the welfare of the country's residents and its national economy.

This report presents the practice of IP management by the government of Israel, focusing on the legal framework and also empirical analysis of R&D outcomes, by examining governmental patent applications, compared to academic patent applications.

2. IP Management in the Israeli Governmental Sector – Case Study

a. Legal Framework

i. Background

IP is a common legal mechanism for transforming theoretical knowledge into an asset and commercializing the legal rights embodied in this knowledge for its use, mainly by commercial entities. In the context of publicly funded R&D activity, carried out in the governmental sector framework by governmental research institutes, IPR are granted to private entities seeking to use knowledge products derived from this activity.

This section presents a case study of IP management policies and mechanisms in the Israeli governmental sector. Government initiatives to define knowledge and technology transfer policies are described, and attempts to regulate government IPR management in the health and agriculture research sectors are examined. As detailed below, Israel presents a case of partial IPR management regulation.

ii. Governmental Initiatives to Define Knowledge Transfer Policy

In the absence of a policy or a systematic approach several attempts were made over the years to design mechanisms for increasing utilization of government-funded knowledge.¹

These efforts were conducted at two main levels: at the coordination level, primarily in the budget context between the different R&D sectors in Israel; and at the legislative level where attempts were made to design a series of mechanisms for knowledge transfer between the different R&D sectors.

Increased attention to knowledge transfer began in Israel in the 2000s. This included: a comprehensive report published in 2003 by the Samuel Neaman Institute and funded by the Ministry of Science and the Israeli Academy of Sciences titled, "Analysis and Policy Recommendations for Technology Transfer from Universities to Industry"; the 2005 "Report of the University-Industry Relations Committee, headed by Prof. Hanoch Gutfreund; a series of discussions held at the Chief Scientist Forum in 2002 regarding governmental IP and summarized in a 2003 report titled "Presentation of the State of IP Status in Government Funded and Commissioned Research"; reports issued from 2005 to 2008 by the interdisciplinary committee for the regulation of IP management within the governmental sector.

While the first two reports focused on knowledge and technology transfer from Israeli universities to industry, the last two focused on R&D activities within the governmental sector.

For the most part all the reports described the existing situation, while ignoring the infrastructure needed for knowledge transfer through IPR commercialization.

In February 2004 the Knesset Science and Technology Committee devoted a discussion to the need for a bill that would regulate R&D funded and conducted by governmental agencies. The committee decided to commission an external consultant to examine the planning and budgeting of the government-civilian research system in Israel. Mr. Guri Zilka, who was appointed as Economic Advisor to the Committee, submitted his report which also included recommendations for planning and budgeting of a civil governmental research system. It also addressed the need to redefine the role of government in the relevant R&D fields and presented an initial list of R&D fields of high national importance. The report mentioned in passing needed mechanisms for knowledge transfer from the governmental sector to industry, including definitions and arrangements regarding IPR.

In conclusion, the different reports gave only limited attention to the governmental R&D sector and to questions relating to appropriate mechanisms for knowledge transfer through IPR commercialization.

iii. Legislation Proposals

The first attempt to define a legal mechanism for the transfer of governmental knowledge products was made on October 11, 2004, with proposed legislation titled "Advancement and Development of Knowledge Generated through Government Research Funding" submitted to the Israeli Parliament – the Knesset.

The bill was based on four main components: (A) Regulating the ownership of knowledge products deriving from R&D activity of public research institutions in Israel; (B) Creating an appropriate infrastructure for transferring such knowledge and technologies for use and

¹ Hagit Messer-Yaron, *The Capitalism of Knowledge* (Ministry of Defense Press, 2008) (HEBREW): 97.

exploitation of the private sector; (C) Rules for the exploitation of IPR by governmental and public research institutions, including licenses for the use of inventions, and the operation of designated projects, including the establishment of start-up companies and the sale of rights; (D) Distribution of income deriving from knowledge transfer activities and commercial exploitation of IPR, including royalties for researchers. The proposed bill also included an article stating that when knowledge is derived from research funded by a government ministry, the government would receive 5% of the revenues as royalties (but no more than the initial grant itself). The bill was never discussed in the plenum.

Another version of the proposed legislation was presented to the Knesset on November 28, 2005. This version was submitted after the first proposal proved to be problematic, *inter alia* because of the interpretation that the provisions of the law apply to universities. Thus, the amended version sought to remove universities from the applicability of the law, since it was clarified that there was no intention to intervene in the knowledge transfer mechanisms of universities, but rather to focus on the governmental sector which suffered from barriers hindering knowledge transfer. The main barrier was that the state, which owned the IPR for knowledge created in the governmental R&D sector, did not have mechanisms for handling knowledge transfer.² This version of the proposed law was discussed in the Knesset Science and Technology Committee, but did not reach the Knesset plenum

Further legislative action occurred in August 2005, with the adoption of a government decision about IPR management in the health system. The decision referred to government hospitals, and stated that the director of the government hospital in which the IP was created would be authorized to act on behalf of the state with regard to IPR commercialization throughout its lifetime.

This decision was the basis for the Directive "Intellectual Property: Management of Research, and Knowledge Products in the Government Health Care System", issued in November 2010.

In May 2011 this Directive, which was a joint initiative of the Accountant General in the Finance Ministry, the Civil Service Commissioner and the Director Generals of the Ministries of Finance and Health, gained the status of a directive with which all government ministries and their auxiliary units must comply, under the name "Management of Knowledge Products". The Directive states that its purpose is to guide the various government ministries in the management of state-owned knowledge products. (Article 2.1).

Appendix A to the Directive addresses the management of research and knowledge products in the government health system, and Appendix B to the management of research and knowledge products by the Agricultural Research Administration. The sections below will elaborate on these two arrangements.

1. Regulation of Knowledge Transfer from Government Hospitals

For many years the transfer of knowledge originating in government hospitals took place in the absence of any policy or arrangement. The "Management of Knowledge Products" Directive was passed in November 2010, to regulate research conducted in government hospitals. In particular, its purpose was to regulate IPR management in these entities, where each hospital or

² Messer-Yaron, *The Capitalism of Knowledge*, p. 100.

health entity may establish internal provisions regarding matters that are not regulated under the Directive provisions. The main provisions are discussed below.

The Directive opens with several definitions, including Applied Research (Article 2.4), which is defined as non-clinical research, and other than the following:

1. Research that constitutes joint development with commercial companies, including an agreement regarding rights or royalties to the hospital research funds or the institution itself;
2. Research financed as part of a work order, including an agreement regarding the distribution of ownership rights of the knowledge products and IPR, or revenues from them;
3. Research in which more than \$ 300,000 was invested;
4. Development of medical equipment;
5. Research in which the financing body intends to encourage commercialization of its products.

The Directive only applies to research defined as applied research, while defining the nature of the research to be conducted as early in advance as possible.

In article 6.2.1 the Directive defines governmental knowledge products as follows:

1. A knowledge product that was created by an employee, owing to the employee's service in a government hospital or during the employee's period of service, even if at the same time she was employed in additional work outside the service, including the academic sector.
2. A knowledge product created by an employee for a period of 18 months after the end of her service.
3. A knowledge product generated in a government hospital.

The Directive also addresses various aspects of the participation of government hospital employees in applied research, and states that the hospital must ensure that the research activity does not impede the provision of optimal medical care to patients in the framework of the government hospital (Article 9.1.1).

With regard to IPR, the Directive states that governmental knowledge products are owned by the state, and that permission to act on behalf of the state in the matter of IPR will be granted to the government hospital throughout the period of protection of the knowledge product or invention (Article 10.1). It is further determined that the knowledge product to be commercialized shall be of a type that can be commercialized according to any law, and in accordance with the relevant ethical rules (Article 11).

The Directive also stipulates that the government hospital may decide on the manner of commercialization and on the institution that will commercialize the knowledge product. The government hospital shall also be permitted to conduct the commercialization itself, to establish a subsidiary or to operate through an external entity that will commercialize the knowledge product (Article 12.2).

With regard to commercialization rights and terms, the Directive states that the commercialization of governmental knowledge products shall be carried out by way of granting a license only, exclusive or non-exclusive, subject to the government's right to make parallel use

under the provisions of the Israeli Patents Law. The commercialization agreement shall set forth provisions that will guarantee indemnification to the government hospital for damages caused to third parties and to the products of commercialization, and for third party IPR violations (Article 13.1).

The Directive addresses the considerations that shall be considered as part of the government hospital's decision-making process regarding the type of license to be granted: rapid development of scientific discoveries to promote science and the public interest; economic considerations, including expected royalties; and accessibility of the products created to the public (Article 13.2). The agreement shall also stipulate provisions guaranteeing that the knowledge products will be used in a way that promotes their application in technologies and medicine, including steps to be taken in the event the said product was not used (Article 13.3). Commercialization shall be carried out so as not to limit continued use of the product by the hospital for further research and scientific development (Article 13.4). In addition, commercialization agreements shall specify that the Minister of Finance will be authorized, in specific cases, to permit parallel use of the knowledge products for compensation, in accordance with the provisions of the Israeli Patents Law (Article 13.6).

In the context of government hospital ownership in a company investing in research, the Directive states that a government hospital shall not be a shareholder in a company that invests in research, including a start-up company, except in specific cases where it is determined that this is the only practical way in which the knowledge product can be exploited for particular research. In any event, the government hospital shall not be involved in the management of such a company (Article 17.2). However, the hospital may appoint a board observer in a company investing in research or in a company established for this purpose, or to a committee of such a company. In addition, the government hospital shall not sign an agreement that will create joint ownership with another entity in the knowledge product.

The Directive determines the distribution of revenues to be received as a result of knowledge commercialization: 35% shall be transferred to the researcher or to the research team, 55% to the hospital and 10% to the state (Article 19). Royalties shall be calculated from "net" income - income from royalty payments after deducting direct and indirect research expenses, including expenses for IP registration, for marketing the knowledge products and for investments in the research, including overhead (Article 19.2). In case of multiple researchers, revenues and royalties shall be distributed according to the agreement between them (Article 19.4). The State's share in the revenues shall be transferred as follows: 50% to the Ministry of Health Chief Scientist's budget, and the remaining revenues to State revenues (Article 19.6).

2. Regulation of Knowledge Transfer from Agricultural Research

Guidelines for the transfer of technologies derived from agricultural research are presented in Appendix B to the Directive. The Directive applies to applied research carried out by the Agricultural Research Administration (Article 3.1.1), and its purpose is to regulate the management of knowledge products and to determine the conditions under which the Administration will be authorized to act with regard to IPR (Article 4).

Article 5 defines the knowledge product of agricultural research as state-owned if created by an employee of the Administration as a result of her service, or during her period of service in the

Administration, including a period of 18 months after expiration of the employment period. Article 7 of the Directive grants the Director of the Administration the right to act in the name of the State regarding IPR in knowledge products, and to make decisions regarding IPR preservation and commercialization.

Commercialization of the knowledge products shall be executed by way of granting a license only, exclusive or non-exclusive, for use of the IPR. The decision shall take into consideration the: rapid development of scientific inventions for the advancement of science and agriculture; economic considerations, including the expected amount of royalties; and public access to the products to be developed on the basis of government knowledge products (Article 9.3). The agreement shall also stipulate provisions that will guarantee use of the knowledge products in a manner promoting their application in technology and agriculture (Article 9.4).

It was further determined that the Research Administration Director shall not be a shareholder in a company that invests in applied research or in a company that receives a license to use the governmental knowledge products, unless approved in advance by the Accountant General (Article 14.2). Article 15 states that the researchers shall not be in a situation of conflict of interests in the research work, and with entities related to the carrying out of the research or commercialization, or with entities that acquired rights in knowledge products.

Regarding the distribution of revenues to be received as a result of the commercialization of the governmental knowledge products, the provision in Section 16 states that net income shall be distributed as follows: 31.5% personal royalties to the researchers, 10% to the IP fund, 33.5% for research conducted by the Administration, and 25% for overhead of the Administration and the State (allocation shall be determined according to income level from royalties, where the overhead ranges from 17.5% to 24% and the State's share varies between 7.5% and 1% accordingly).

b. IP management in the Israeli Government Sector – Empirical Research

i. Patent Application Analysis - General

The empirical methodology used in this study is based on patent application analysis. Besides defining exclusive legal rights granted by the state, patents also provide valuable information about existing knowledge, such as technological advances, prior art and the identity of the inventors and assignees. Consequently, patents and patent applications are frequently used as statistical indicators for inventive activity and as proxies for measuring technological and scientific developments.³

Patent-based statistics are used to measure inventiveness and R&D activity and to predict economic and technological performance.⁴ The assumption is that patents reflect inventive

³ Griliches, Z., *Patent Statistics as Economic Indicators: A survey*, 92 JOURNAL OF ECONOMIC LITERATURE, 630–653 (1990). See also Shyama V. Ramani & Marie-Angele de Looze, *Country-Specific Characteristics of Patent Applications in France, Germany and the UK in the Biotechnology Sectors* 14(4) TECHNOLOGY ANALYSIS AND STRATEGIC MANAGEMENT 457 (2002). Nonetheless, while patent applications indicate successful research they do not reflect all the research efforts involved in an invention. See OECD, OECD PATENT STATISTICS MANUAL, 26 (2009).

⁴ OECD PATENT STATISTICS MANUAL, *id.*

output, and that more patents implies more inventions.⁵ Patents are also used to map dynamics of the innovation process, among them cooperation in research and the diffusion of technology across industries or countries; the competitive process, e.g., business strategies; and other issues such as the internationalism of research, co-inventions and the global mobility of inventors.⁶ Since patents can be obtained at different stages of the R&D process, they can reflect R&D (upstream inventions) and provide input to innovations (downstream inventions). Therefore, patent data provides a useful bridge between data regarding investments in R&D and data on innovation.⁷ For all these reasons patent analysis is a useful statistical tool for measuring inventive activity.

Notwithstanding, when analyzing patent data one must take into account the fact that not all inventions are patented. Financial constraints or strategic considerations may prevent inventors from patenting their inventions. Moreover, patents do not fully reflect the innovative effort or the degree of originality and creativity of a given invention.⁸ In fact, some patents have no industrial application and therefore are of little, or no, benefit to society other than the information disclosed in the patent. Another issue that should be taken into consideration when relying on the analysis of patent applications concerns the high filing fee of a patent application, such that patents are more accessible to larger companies than to smaller companies and individuals. Finally, patent laws and practices vary across countries, making it more difficult to draw comparisons unless the same set of patent offices is analyzed.⁹ Keeping these limitations in mind, patent data provides a useful tool for identifying R&D trends.

ii. Methodology

The main purpose of this chapter is to present the scope and nature of the inventive activity taking place within the framework of government R&D, as well as the scope of IPR used in implementing governmental R&D policy over the years.

For the purposes of the study I used the PatBase database in order to create a database of patent families owned by the State of Israel, *i.e.*, the State of Israel or any government institute that carries out governmental R&D activities is stated as the assignee of the patent application (exclusive or shared).

The database included 1577 patent families which comprised the study population.¹⁰ These families included patent applications as well as registered patents. The patent families owned by the State of Israel were identified for the period from 1989 to December 31, 2015.

More specifically, the process of building a database of patent families owned by the State of Israel was conducted as follows:

⁵ OECD PATENT STATISTICS MANUAL, *id.* at 26; ZVI GRILICHES, R&D AND PRODUCTIVITY: THE ECONOMETRIC EVIDENCE (1998).

⁶ OECD PATENT STATISTICS MANUAL, *id.* at 26.

⁷ OECD PATENT STATISTICS MANUAL, *id.*, at 27.

⁸ A similar argument can be made regarding the use of researcher numbers and research expenditure figures, which nonetheless are accepted statistical tools for measuring innovation/inventive activity. See Comanor & Frederic M. Scherer, *Patent Statistics as a Measure of Technical Change*, 77 J. POL. ECON. 392, 393; Frederic M. Scherer, *Firm Size, Market Structure, Opportunity, and the Output of Patented Inventions*, 55 AM. ECON. REV. 1097, 1098 (1965).

⁹ OECD PATENT STATISTICS MANUAL, *supra* note 3, at 27-28.

¹⁰ For further explanation of patent families see OECD PATENT STATISTICS MANUAL, *id.* at 71.

In the first stage I mapped the Israeli Governmental Institutes and searched for patent applications filed by these institutes. I then conducted another search, looking for the words “State of Israel” among the assignees. The two lists were merged into one list and manually cleaned up from errors. When a government entity that was not included in the initial list was detected, another search was conducted in the PatBase database, targeting the new entity. After compiling the database, the following analyses were performed: analysis of patent application filing by years, analysis of patent applications by classifications and analysis of patent applications according to the prominent government institutes.

iii. Results

Israeli patent applications filed with the Israeli Patent Office (ILPO) amounted to 26,372 in the period 1989-2015, of which only 6% (1,577) were patent applications filed by governmental institutes. In other words, number of patent application filings of patents that originated in the government R&D sector was negligible compared to the general patent application filing activity in Israel during this period.

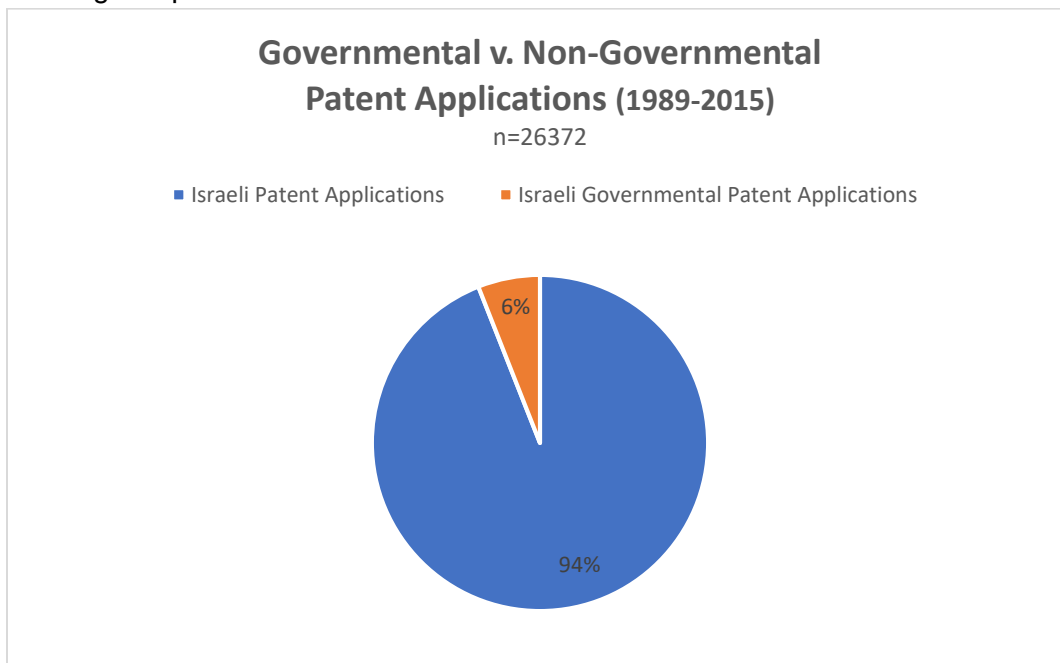


Figure 1: Israeli Governmental v. Non-Governmental Patent Applications, (1989-2015)

Figure 2 below shows the distribution of patent applications filed by Israeli universities by year, between 2008 and 2017.¹¹ The figure shows an increased number of patent applications since 2015, from 372 to approximately 450 applications in each of the years 2016 and 2017. The average number of patent applications filed by Israeli universities is about 408 per year, with more than 4,000 applications filed over the past decade. As seen in Figure 1, this number is

¹¹ The Israeli Central Bureau of Statistics, Survey of Knowledge Commercialization Companies in Israel 2017 Reports on Inventions, Patents, License Agreements, Income and Startup Companies (http://www.cbs.gov.il/reader/newhodaot/hodaa_template_eng.html?hodaa=201812257). P.4

significantly higher than the number of patent applications filed by the government sector in Israel.

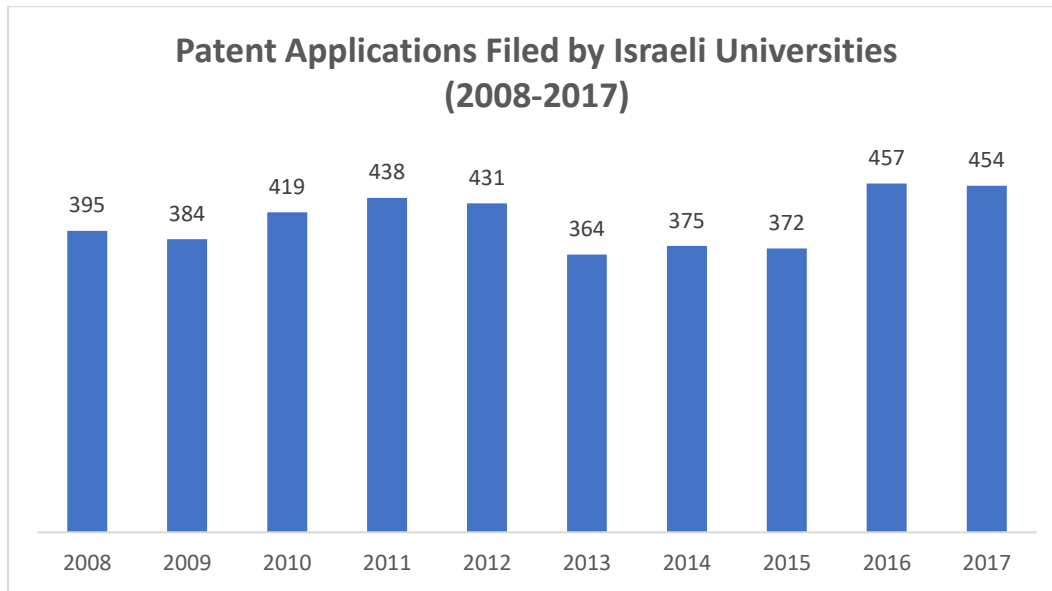


Figure 2: Patent Applications Filed by Israeli Universities (2008-2017)

As Figure 3 indicates, despite the increased filing rate of patent applications in recent years, the revenues of Israeli Technology Transfer Companies (TTC) have declined since 2012, from US \$ 506 million in 2012 to US \$ 359 million in 2016.¹² It is reasonable to assume that the patent application increase by Israeli universities is not yet reflected in TTC revenues, and will be seen in data in the coming years.

¹² The Israeli Central Bureau of Statistics, Survey of Knowledge Commercialization Companies in Israel 2017 Reports on Inventions, Patents, License Agreements, Income and Startup Companies (http://www.cbs.gov.il/reader/newhodaot/hodaa_template_eng.html?hodaa=201812257). P.7

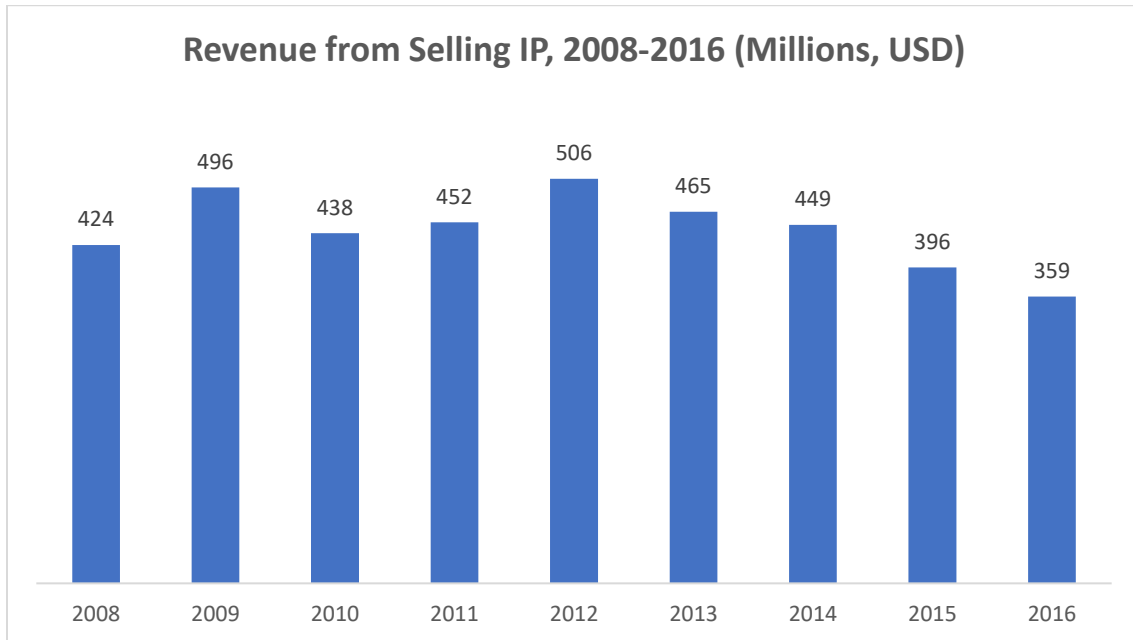


Figure 3: Revenue from Selling IP, 2008-2016 (Millions, USD)

Figure 4 below shows the distribution of patent applications filed by government institutes between 1954 and 2015. Large variation can be seen in the number of annual patent applications filed during this period, with “peaks” occurring every few years. For example, 39 patent applications were filed in 1968, a total of 72 were filed in 1994, and 41 government patent applications were filed in 2009.

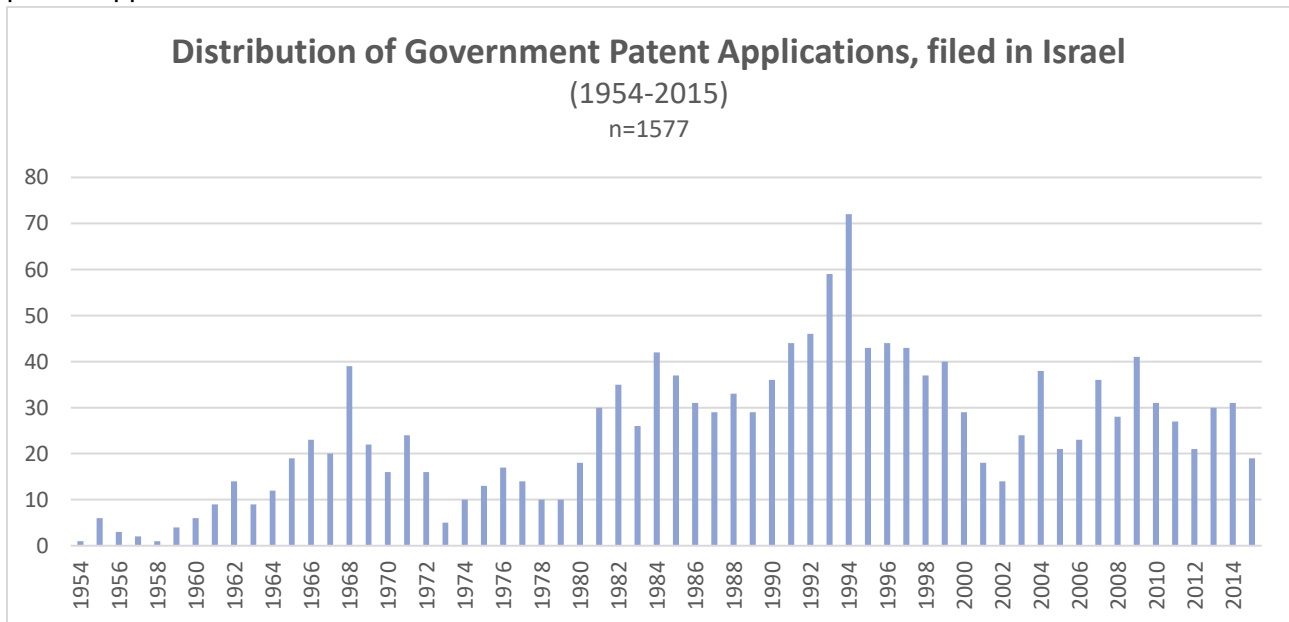


Figure 4: Distribution of Government Patent Applications, filed in Israel (1954-2015)

Figure 5 shows a comparison of the number of patent applications filed between 2008-2015 by Israeli universities and government institutes. It can be seen that during these years government institutes filed, on average, 93% less patent applications compared to Israeli universities.

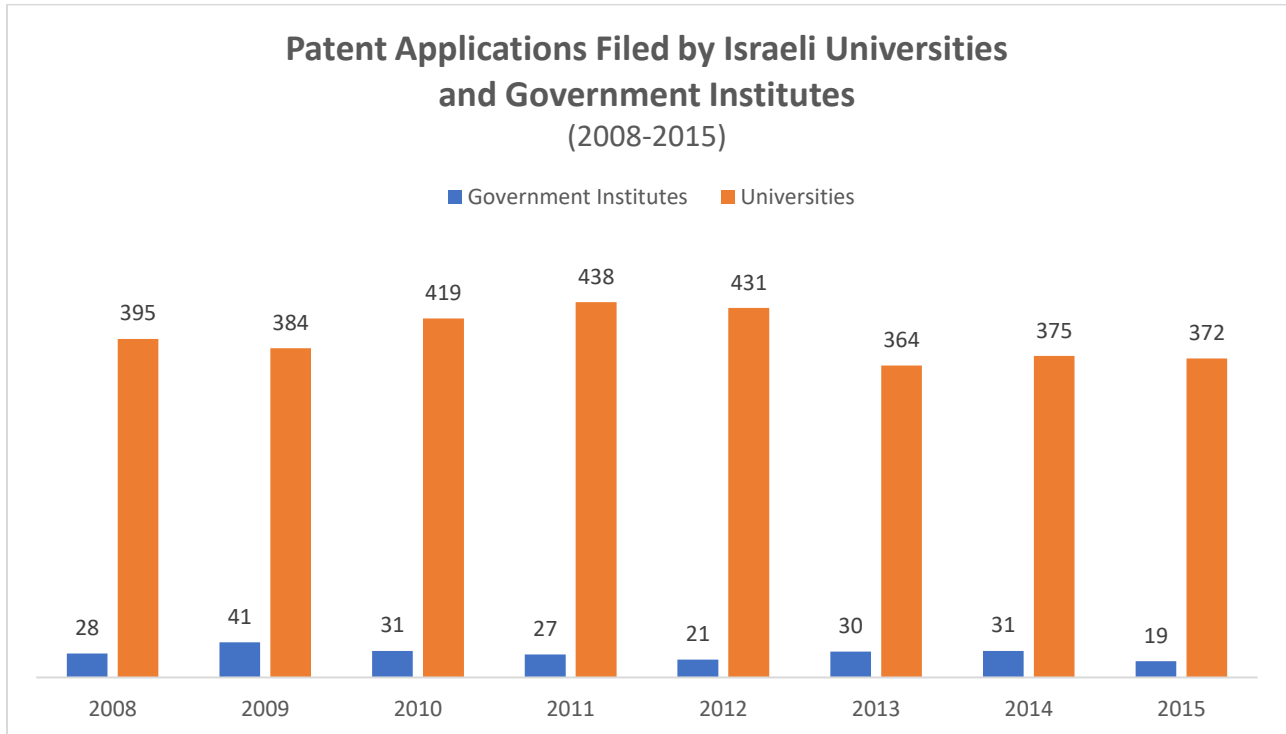


Figure 5: Patent Applications Filed by Israeli Universities and Government Institutes (2008-2015)

Figure 6 below shows the number of countries in which a patent application was filed. The majority of patents (760) were filed in only one country, followed by only 176 in two countries. A patent application filed in only one country may sometimes indicate a weakness of the patent.

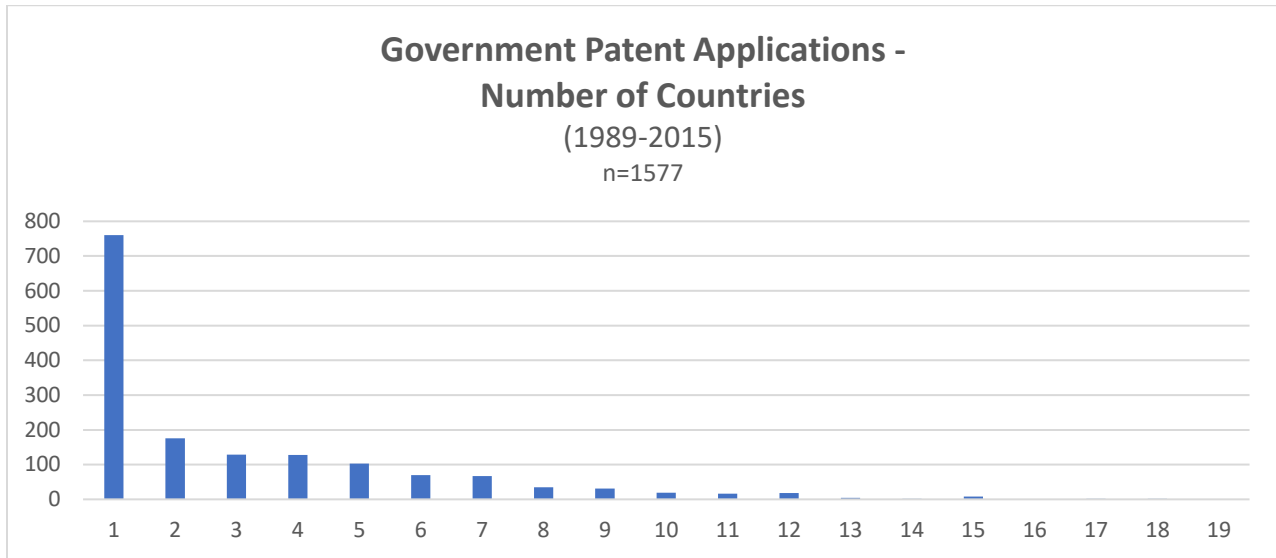


Figure 6: Government Patent Applications - # of Countries in which filed (1989-2015)

Figure 7 below shows the classifications under which the government patent applications were filed.

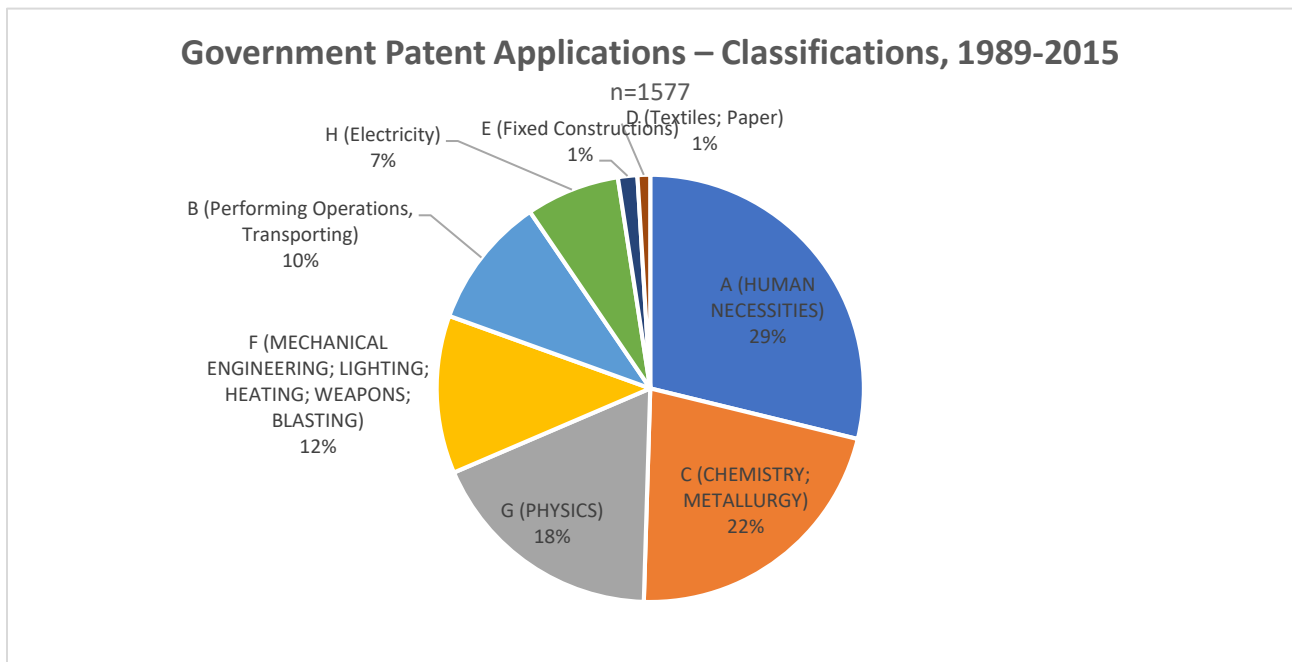


Figure 7: Government Patent Applications – Classifications (1989-2015)

Figure 8 shows the leading government entities (assignees) according to the number of patent application filings. It can be seen that the leading entity is the Atomic Energy Commission, followed by the relative predominance of government hospitals.

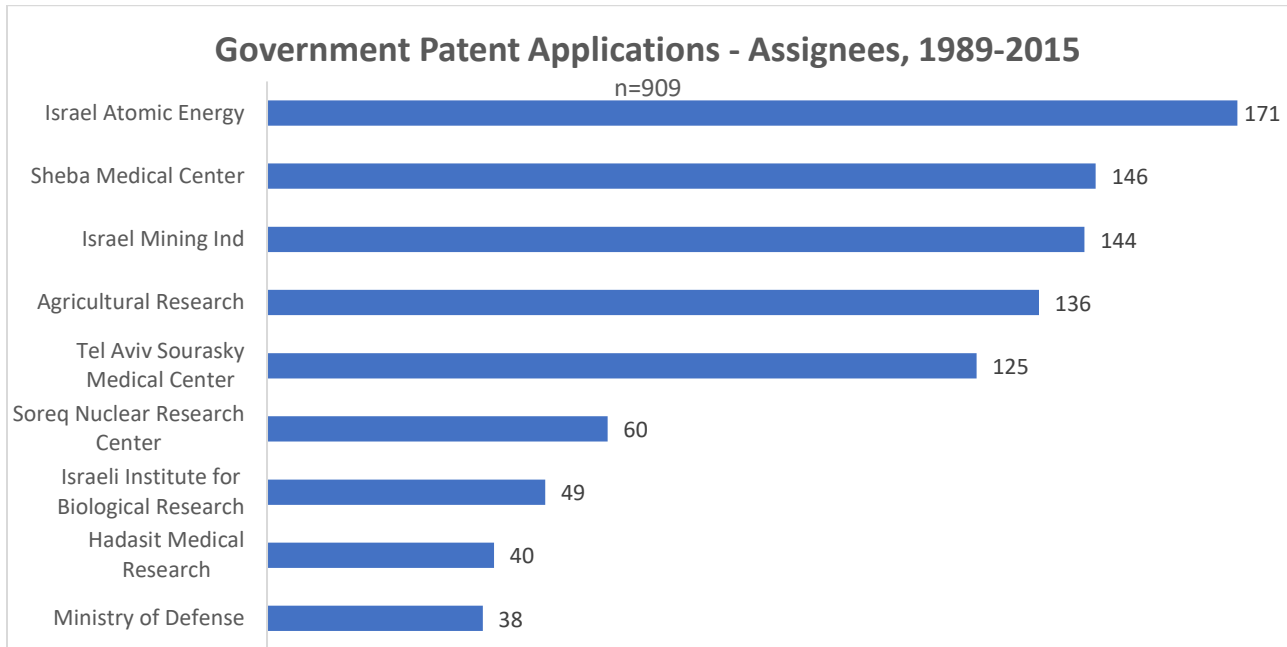


Figure 8: Government Patent Applications (1989-2015) – Assignees

iv. Conclusions

The study presents the trends in patent application filing in the government R&D sector in Israel. One significant finding is that the scope of government patent filing is limited and stands at only 6% of the total number of patent applications filed with the ILPO, with a mixed trend in the number of patent applications filed over the years.

The study also shows that many patent applications were filed in only one country. This may attest to the weakness of the patent or to lack of a real intention to commercialize it.

Examining the prominent government R&D entities according to their share of filed patent applications, the study findings show the relative predominance of government hospitals. As for the question as to whether this is the result of a deliberate policy or the natural result of the R&D activities carried out in this sector, it remains open and in need of further examination.

It is important to note that lack of registration of state-owned IPRs does not necessarily indicate underactivity of government entities conducting R&D, and may attest to transfer of knowledge to private entities or refraining from filing a patent application for new inventions.

In the absence of a clear policy on this matter, the concern is that publicly-funded knowledge and technologies will find their way to the private sector in a manner that is not necessarily compatible with the public interest as reflected in state-funded research to be conducted in the government sector.

A comprehensive policy regarding the management of state-owned IPRs, that will include design and application of monitoring and oversight mechanisms, may help improve this situation.

3. Big Data and IP Management in the Government Sector

a. Big Data and Data Driven Innovation

Personal data is collected regularly by government agencies as well as private and business entities, and in the Big Data era this data can be analyzed using advanced data analytics technologies such as machine-learning and artificial intelligence.

Data Driven Innovation (DDI) has become a significant source of economic growth in recent years through two key contexts:¹³ (1) Data as an infrastructural source that can be used by an unlimited number of users and for many and varied purposes to produce innovative goods and services. One of the prominent examples is the use of data collected about social media users for commercial purposes;¹⁴ (2) Use of value creation mechanisms of data analytics in order to gain insights about various contexts, for example commercial companies' use of data to conduct analyses,¹⁵ and designing automated decision-making systems based on machine-learning.¹⁶

Despite the growing focus on "Big Data", there is no clear definition of this term. Initially it referred to data sets of a significant volume, and therefore presented a challenge for data management and processing. However, it seems that referring solely to the data volume and database size component is both misleading and unsatisfactory. Today it is recognized that not only is data volume significant, but also the way the data is used and the complexity of its use. Thus, it is currently accepted to refer to three main characteristics of Big Data: (1) the volume of data; (2) the variety of data, which refers to unstructured data sets from varied sources, among them web logs, social networks, mobile communications, sensors and financial transactions; and (3) the velocity at which data is generated, accessed, processed and analyzed.

The Big Data era has not bypass government agencies in Israel, and several public agencies currently recognize the wide-ranging potential uses of the data they collect and produce. Consequently, they are taking steps to analyze this data and to make it accessible to different entities for varied purposes. This includes, among others, administrative and medical data collected as part of the Health Ministry's activities and data collected in surveys conducted by the Central Bureau of Statistics.¹⁷ These entities consolidate data that is processed and de-identified in a central database, and in some cases made partially accessible to the public as well as to researchers under certain conditions. In many cases the data is not used at all.

There are several significant advantages to using advanced analytics technologies in public databases. For example, access to government databases for the benefit of public and private entities may help gain in-depth knowledge about a wide range of issues, promote innovation

¹³ ORG. FOR ECON. CO-OPERATION AND DEV. [OECD], DATA-DRIVEN INNOVATION FOR GROWTH AND WELL-BEING: INTERIM SYNTHESIS REPORT 14 (2014).

¹⁴ See, e.g., Dokyun Lee, Kartik Hosanagar & Harikesh S. Nair, *Advertising Content and Consumer Engagement on Social Media: Evidence from Facebook*, MGMT. SCI. (forthcoming), <https://ssrn.com/abstract=2290802>

¹⁵ Julian Birkinshaw, *Beware Data Overload: Don't Let Analysis Paralysis Stunt Your Business*, GUARDIAN, Apr. 21, 2017, <https://www.theguardian.com/small-business-network/2017/apr/21/big-data-overload-analysis-paralysis-stunt-business-growth>

¹⁶ See Tal Zarsky, *The Trouble with Algorithmic Decisions: An Analytic Road Map to Examine Efficiency and Fairness in Automated and Opaque Decision Making*, 41 SCI. TECH. & HUM. VALUES 118 (2015).

¹⁷ Tal Zarsky & Sharon Bar-Ziv, *Privacy's "Identity" Crisis – Regulatory Strategies in the Age of De-identification*, From Private to Public: Privacy, Law and the Surveillance Society (manuscript at 17 *et seq.*) (in Hebrew. forthcoming).

through technology based on these databases, improve decision-making processes, advance government transparency and foster the democratic discourse in general. Alongside these significant advantages, use of Big Data poses many challenges, among them the best way to define data ownership and to incentivize data management. While DDI requires significant investment in developing and maintaining databases, at the same time organizations and individuals may not have the incentive to share the data they own or control. Intellectual property rights are sometimes proposed as a solution to the incentive problem, however with respect to data this mechanism may be unsatisfactory and may also challenge existing conceptions, for example the concept of data ownership.

The following section reviews the legal framework for discussing IP management of government databases.

b. Government Databases and the Copyright Regime

Copyright is an intangible right which grants the rights holders many sub-rights to utilize them it, *inter alia*, with the aim of providing an incentive for creativity for social benefit purposes.

An examination of the protection of government databases raises two central questions: the protection of works originating from a government source, and the protection of databases in general.

With regard to the protection of government-originated works, the Berne Convention, which addresses the protection of literary and artistic works, accords the Convention signatories the freedom to determine whether to grant copyright protection to “official texts of a legislative, administrative and legal nature, and to official translations of such texts”. While countries such as the U.K. grant copyright protection to government works, other countries – such as the U.S. and Israel – do not.¹⁸

Regarding the protection of databases, Article 1 to Israel’s Copyright law passed in 2007 defines a “literary work” as including “works expressed in writing, lectures, tables, compilations, and also computer programs”, with a compilation defined later in the Article, *inter alia* as “... a compilation of data, including a database”.

The term “database” itself is not defined in the Israeli law, but section/Article 4(b) determines that the “originality of the compilation means the originality in the selection and arrangement of the works or of the data embodied therein”. In other words, the creator of a compilation is required to demonstrate some kind of creativity in order to obtain copyright protection, and effort alone is insufficient. The required level of creativity however is far from high. It is important to emphasize that copyright of a compilation protects the arrangement of the material included therein yet does not apply to the data itself that may be unprotected materials, such as facts or data.¹⁹

Inclusion of databases as part of protected works under the copyright law is the result of the development of computerized databases, and well as the great effort and financial investment they embody. The European Union, for example, determined that this investment justifies protection and issued a directive²⁰ requiring EU countries to protect databases by copyright, while non-original databases such as compilations of legal cases and laws, listings of

¹⁸ Berne Convention for the Protection of Literary and Artistic Works, art. 2/4, Sep 9. 1886.

¹⁹ Israeli Copyright Law (2007), Article 5(4).

²⁰ Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases

advertisements or databases of scientific publications can also be protected if the investment in obtaining, verifying and presenting the data was substantial. This protection is known as the “sui generis” database right, which recognizes the investment made in compiling a database, even when this does not involve the “creative” aspect that is reflected by the copyright.

Despite the various legal arrangements, it seems that the current protection of databases, that is based on a copyright regime, provides very weak protection.²¹

c. The Israeli Case - Initial Reference by Policymakers

In recent years various bodies in Israel have considered the array of implications and challenges involved in using government databases. Within this framework various committees were established which published their recommendations. An example is the report issued by the Government ICT Authority, the entity responsible for achieving the state’s various computerization goals, including “e-government” and “accessibility of government information and services to the public”.²² The Authority published its report to the public in July 2016, and in August 2016 its recommendations were included in a government decision aimed at improving the transfer of Government information and accessing of government databases to the public.²³ The purpose of the report was to encourage innovation in providing services to the public based on the exposure of databases and the transparency of public activity.²⁴ The report addresses, among other things, the issue of IP noting that in view of the great importance of public access to government databases, the Accountant General had given his agreement to the unrestricted use of databases without IP restrictions or the collection of royalties from database users.²⁵ This position is also reflected in the terms of use of the data.gov.il website, a platform which publishes data files extracted from government databases. These terms of use determine that the information is protected by IPR, including copyrights, which are owned by the State of Israel. However, use of these databases is based on free licensing, with no royalty obligations, and use of the information is for an unlimited period of time.

Various Israeli government entities involved in the creation and use of databases examined this issue in recent years. For example, the recently published report of the Committee on the Implementation of Recommendations on Secondary Uses of Health Information²⁶ recommends that information producers and information consumers be permitted to decide between them on issues regarding IPR, royalties and rights to use information products, yet not to interfere with the incentives to make information available and accessible.

This short review shows that, as far as government databases are concerned, there is an understanding that they can constitute a source of significant innovation, and therefore free

²¹ It is important to emphasize that this does not constitute a normative statement as to whether databases should be protected by copyright, and the implications of such protection for the creation and accessibility of databases should be carefully examined.

²² www.gov.il/he/Departments/government_ict_authority.

²³ Government Decision 1933 “Improving the Transfer of Government Information and Accessing Government Databases to the Public” (August 30, 2016).

²⁴ “Final Report - The Inter-Ministerial Team for Making Public Databases Accessible”, Opinion of the Government ICT Authority, Office of the Prime Minister, p.6 (July 6, 2016).

²⁵ ID on p. 27.

²⁶ Ministry of Health, Conclusions of the Committee for the Implementation of Recommendations for Secondary Uses of Health Information 42 (2018)

access is granted to these databases while leaving the IPR (if any) in the hands of the state. At the same time however, there are those who maintain that the issues and the attendant arrangements should be determined on a case by case basis.