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Small Pool for Big Data: Researching for Sustainable Data Focused on Open Government Data (OGD) Movement

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Abstract

When Sir Isaac Newton said his famous statement "standing on the shoulders of giants," it was a modest phrase and explained the necessity of sharing knowledge or information to make the next intellectual progress. The data industry is now the fastest developing area, but many ambiguities are a subject in law. The protection of data is a fascinating and still unsolved challenge for intellectual property law. Data is essential in the matter of new industry and our lifestyle at individual, corporate, and institutional levels. And the legal protection needs to work to offer vivid transactions of data for creative interactions. However, many enterprises consider data an asset for business profit as the data industry grows vast and fast. Data raises diverse policy debates that arise in the better-known intellectual property areas, for instance, copyrights, unfair competition, and trade secret. The vague aspects of data implicate a number of intellectual property approaches. It also extends to the economic problem 'tragedy of anti-commons' that fragmented ownership is disrupting sound usage.

In this regard, Open Governmental Data (OGD) is one way to resolve inefficiency in the data industry. The government collects massive personal data and reproduces datasets in the process of administration. Many governments give back the public data for private sectors anticipating the data works for new enterprise seed money.

This work looks at three considerations about the legal aspects of data. At first, we will see the necessity of big data in current and reasons for the government to pay attention to open data to the

public. The data industry market's inefficiency discourages cumulative innovation in our society and approaches the benefits of sharing data in the private economy or OGD movement. Second, the paper conducts principles of OGD and takes a functional approach in analyzing the related IP laws in database protection and public accessibility. Interestingly various governments are opening data that compares various OGD models from different countries led by other stakeholders, including government, large companies, small to medium enterprises ("SMEs"), and how they work as a member of OGD. Finally, it critiques the current OGD movement and suggests that corporate OGD strategies granting autonomous would help resolve the anti-commons of IP in the big data industry.

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I. Introduction

"Data is the new oil" since a British data science expert first used the phrase in 2006, many entrepreneurs and policymakers repeated and amplified.[1] As he predicted, data becomes an essential asset of the business model now. Netflix, the largest online movie rental service provider, gives accurate recommendations based on algorithms that keep its customers returning to the website. Even the company held an open competition for filtering algorithms to predict user ratings for films until 2009, and the winner could successfully predict the next customers' movie choice ratings by 10.06%.[2]

The application of big data is not limited to the private industry. When the H1N1 virus, which deformed from swine flu, infected many people around the world in 2009, the Centers for Disease Control and Prevention ("CDC") had difficulty in tracing the infection route. To catch up on the virus, CDC had to wait almost two weeks to get information that a patient recognizes the symptom, meet a doctor, and wait until the medical test results. During this time, the virus already moves to another patient who does not feel infection and escape the blockade zone. Google suggested a connection between search records and the disease of the virus. Google founded high correlative

[1] Clive Humby, ANA Senior marketer's summit in Kellogg School (Nov. 2006) ("Data is just like crude. It is valuable, but if unrefined it cannot really be used. It has to be changed into gas, plastic, chemicals, etc to create a valuable entity that drives profitable activity; so must data be broken down, analyzed for it to have value).

[2] *See in general* Paul Ohm, *Broken Promises of Privacy: Responding to the Surprising Failure of Anonymization* UCLA Law Review, Vol. 57, 1701 (2010); Casey Johnston, *Netflix Never Used Its $1 Million Algorithm Due To Engineering Costs*, Wired (Apr. 16. 2012) (*available at* https://www.wired.com/2012/04/netflix-prize-costs/).

keywords, which inferring a person might have a symptom of the virus.[3] As a result, CDC could take action to prevent the contagion of the virus in real-time without the complex test.

After eleven years later, the COVID-19 break out of the world, but advanced technology helps analyze the information for the right decision. MiPasa is an open data hub appliable to machine learning or AI analysis based on a blockchain-backed database.[4] MiPasa specialized for normalizing and standardizing of virus-related data from different authors and formats to build a single platformed dataset.[5] It also uses blockchain technology to make sure the integrity of data for further research. IBM, Oracle, Microsoft, The Weather Channel, and various universities and government organizations participate in the project now.

Interestingly, the database process does not explain the causality of the result. Instead, it tried to find a meaningful correlation between the current and the future. It is a different approach for a typical method to settle a problem because it ignores the cause of the problem. However, the procedure is based on a substantial quantitative dataset to draw new inspiration or new kind of values which are not available in small-sized research.

Today, big data has become a new empirical research tool in various fields. However, this new technology necessitates a silo to save a certain amount of data for providers, at a huge cost for

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[3] *See in general* David Lazer, Ryan Kennedy, Gary King, & Alessandro Vespignani, *The Parable of Google Flu: Traps in Big Data Analysis*, Science, Vol. 343, Issue 6176, 1203-1205 (Mar. 14. 2014), (*available at* https://science.sciencemag.org/content/343/6176/1203).

[4] *See* Jonathan Levi, *Utilize blockchain-backed COVID-19 data with MiPasa by HACERA*, IBM, (May 4, 2020) (*available at* https://developer.ibm.com/callforcode/blogs/mipasa-open-data-hub-enables-developers-to-build-apps-to-fight-covid-19/).

[5] *Id.*

creating and maintaining data storage. This work attempts to navigate a middle ground between the private and public sectors to help build consensus for efficient use of valuable data. The main question of the article is how a legal system can support sustainable supply for the accessing of essential data needed by our society. Many governments begin to open public data anticipating the new industrial growth and social innovations. For instance, the U.S. government argued the necessity of opening government data using a common set of standards.[6]

In this work, several issues prevent a positive outlook of big data. Michael Heller concerned the underuse of intellectual property rights in the industry because too many owners holding the reasons in previous discoveries may disturb to future development.[7] It undoubtedly makes a problematic circumstance to negotiate with thousands of IP holders individually. High transaction costs or entry barriers are also obstructing newcomers to join the market even they have innovative ideas.[8] Moreover, database protection in law too different depends on countries and regions.[9]

Fortunately, there have been several efforts to overcome the underuse of data usage. Elinor Ostrom, the winner of the Nobel Prize in economics, demonstrated the benefits of autonomous

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[6] *See e.g.* The Digital Accountability and Transparency Act, Pub. L. No. 113-101, § 128 Stat. 1146; Directive 96/9/EC of the European Parliament of the Council of 11 March 1996 on the Legal Protection of Databases, 1996 O.J. (L. 77) 20; Act On Promotion Of The Provision And Use Of Public Data, Act No.14839, Jul. 26. 2017, (S. Korea).

[7] Michael Heller *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets,* 111 Harv. L. Rev. 621,688 (1998) (pointed out fragmentation of the modern use of intellectual property combining with economics.).

[8] *See* Daniel L. Rubinfeld & Michal S. Gal*, Access Barriers to Big Data,* 59 Ariz. L. Rev. 339,351 (2017).

[9] U.S. and EU discussed the scope of copyright protection of database, but they could not meet consent: *see* WIPO, SCCR/8/3, Sanding Committee on Copyright: Summary on Existing Legislation Concerning Intellectual Property in Non-Original Databases and Related Rights (Nov. 2002); *see also* Mark Davison, *Database Protection: Lessons from Europe, Congress, and WIPO*, 57 Case W. Res. L. Rev. 829.

organization.[10] Since the organizations made clear rules and boundaries, they can build more sustainable communities against evil influences. In the early 2010s, people try to relinquish ownership of vehicles or houses, and then they begin to share with others. This sharing movement resultingly increased the efficiency of the products rather than when a person owns it. The government also begins to share public data with the public to increase the value of the data.

This work is broken down into three chapters. Chapter I explains the necessity of big data in current and reasons for the government to pay attention to open data to the public. Chapter II investigates the "tragedy of anti-commons" in intellectual property, discouraging cumulative innovation in our society, and introduce benefits of sharing data in the private economy or Open Government Data ("OGD") movement. Chapter III applies principles of OGD and takes a functional approach in analyzing the related IP laws in database protection and public accessibility. Chapter IV compares various OGD models from different countries led by other stakeholders, including government, large companies, small to medium enterprises ("SMEs"), and how they work as a member of OGD. Chapter V then critiques the current OGD movement and suggests corporate OGD strategies granting autonomous rights. Chapter VI completes the investigation by offering how OGD may help resolve the anti-commons of IP in the big data industry.

[10] *See* ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION 103-142 (Cambridge University Press 2015).

II. Problems of Data Underuse and Current Efforts

This work explores the underuse of databases in intellectual property disputes to resolve legal issues about the use of such databases for public purposes. Today, many governments made data open and accessible rather than just maintaining it. Governments have collected enormous amounts of data for administrative use and have come to realize that this data is a valuable societal resource. Most of countries already have open access, offering a considerable amount of public sector information that they have stored. This trend is expected to grow the amount and availability of data and begin to end a data oligopoly.

The huge quantity of data infers high probabilities without a rational human process or one involving artificial intelligent.[11] Today, we are living with various kinds of smart devices, which produce personal data that companies collect under a contract we enter into when we purchase the products or services. Some giant IT enterprises' possession of this data as property or resources might be cause for concern because of the biased usage of data. .[12] Data is not only beneficial to

[11] VIKTOR MAYER-SCHONBERGER & KENNETH CUKIER, BIGDATA: A REVOLUTION THAT WILL TRANSFORM HOW WE LIVE, WORK, AND THINK (Houghton Mifflin Harcourt 2013) (Google took the 50 million most common search terms that Americans type and compared the list with CDC data on the spread of seasonal flu between 2003 and 2008. After the process Google can tell where the flu had spread in real time when the H1N1 crisis struck in 2009.).

[12] The debate of the right balance of Intellectual Property has been discussed long time. *See* Letter from Thomas Jefferson to Isaac McPherson (Aug. 13, 1813), in 6 THE WRINGS OF THOMAS JEFFERSON 175, 180 (H.A. Washington ed., 1861) ("That ideas should be freely spread from one to another over the globe, for the moral and mutual instruction of man, and improvement of his condition, seems to have been peculiarly and benevolently designed by nature, when she made them, like fire, expansible over all space, without lessening their density at any point, and like the air in which we breathe, move, and have our physical being, incapable of confinement."). *See* Mark A. Lemley, *Property, Intellectual Property, and Free Riding,* 83 Tex L. Rev. 1031 (2005); *see also* James Boyle, *The*

commercial, but also it has possibilities to enhance public interest. Among the various criticized aspect of the data possession, this dissertation considers the underuse of data, the so-called "tragedy of anti-commons."

The problem of underuse IP occurred early in the medical industry when each pharmaceutical company established a high cost for research and development, resulting in excessive patent protections or licensing contracts.[13] The pharmaceutical companies pass on their development costs to their customers, leading to decreased benefits from their research for the wider society Thus, for example, during the Avian Flu epidemic that occurred in the mid-2000s, many developing countries had trouble securing enough medicine, given the excessive costs set by the medicine industry. Michael Heller's insight on this matter is not limited only to the pharmaceutical industry but also pertains to the general field of intellectual property..

The underuse issue precludes the access to public demanding with excessive transaction cost or building an entry barrier. This kind of "patent thicket" is a typical example of the misappropriation of intellectual property regulation, which slows down the speed of innovation.[14]

The complexity of modern technology results in an overlapping set of patent rights that require those who seek to commercialize new technology to obtain permissions from multiple related patentees. For example, patent trolls continuously purchase unrelated patents to earn royalty fees

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Second Enclosure Movement, and the Construction of the Public Domain, *66 L*aw and *C*ontemporary *P*roblems 33-74 (2003)

[13] *See,* Heller *supra note* 7.

[14] *Id*; *See also*, Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting,* 1 Innovation Pol'y & Econ. 119 (2000) (reasoning the powerful transaction costs that can burden innovation in current IP industries.), *See,* Jorge L. Contreras, *Much Ado about Hold-up*, 2019 U. Ill. L. Rev. 875 (2019).

from third parties rather than develop related technologies.[15] As a result, many companies undercut their motivation to innovate by paying excessive royalties. These behaviors are rightly criticized from the perspective of intellectual property law, one of whose original purposes is to promote creative human activities.[16]

In this regard, the data industry also seems affected by the crisis of underuse. The major source of data that this pertains to is the big data handled by some leading IT companies or consulting firms.[17] Google and Apple, which receive billions of people's data, provide efficient service based on big data and algorithms. Since the industry requires huge amounts of capital to collect and manage this enormous volume of data. only a few large and vertically integrated companies have the ability to become part of the mega-data industry.

These and other service providers collect a huge amount of data in their server to predict their customers' future behavior. Therefore, one probably cannot expect of the current data industry structural innovations by newcomers structually. The barriers to entry or gaps in information have worried many scholars.[18] Free-riding was a typical concern for many IP holders in the past but

[15] Electronic Frontier Foundation, Patent trolls, (last visited May. 28, 2020), https://www.eff.org/issues/resources-patent-troll-victims, (describing a patent troll that uses patents as legal weapons, instead of creating any new products or coming up with new ideas).

[16] U.S. CONST. art. I § 8 cl. 8 of the United States Constitution grants Congress the enumerated power "To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."

[17] *See* Forbes Insight, T*he Commerce of Data Opportunity*, Forbes, http://www2.criteo.com/vibrant-future (last visited Aug. 13, 2018.); *See* Ohm *supra note* 2.

[18] Dan Hunter, *Cyberspace as Place and the Tragedy of the Digital Anticommons,* 91 Calif. L. Rev. 439, 445 (2003).

today, we also have to worry about "underuse" that impedes innovation and fair competition.[19]

Intellectual property rights, especially for data, must be viewed from the perspective of whether the possession of intellectual property devolves to the benefit of the wider community. According to the concerns of anti-commons supporters, fragmental patents block caused by high transaction cost or exclusive competition would decrease predictable development or usage of current resources until the holders allow their use. Compared to natural resources, a characteristic of data or information is that it is not depleted because of overuse.[20] Therefore, the overconsumption, underinvestment, and ultimately depletion of the resources that is described in Hardin's famous article "The Tragedy of the Commons*"* does not occur in the data industry.[21] However, current intellectual property protections of data disturb the creative activities by requiring excessive licensing fees or blocking usage.[22]

Various intellectual products, including data, develop referring already existed stuffs. Cumulative innovation is at the core of the scientific method by accessing many previous findings for future discoveries or inventions.[23] It is extremely hard to expect the invention of innovative products or services by the individuals or start-ups that built Silicon Valley in the past. As a result of excessive data protection under the IP law and market are likely to be underused and innovation will be

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[19] CHARLOTTE HESS, ELINOR OSTROM, UNDERSTANDING KNOWLEDGE AS A COMMONS: FROM THEORY TO PRACTICE, 4 (MIT Press, 2007).

[20] Heller *supra note* 7 at 698.

[21] Garret Hardin, *The Tragedy of Commons*, Science 162, no. 3859, 1243 (1968) (explaining failure of resource management without regulation and suggesting government regulation and private ownership as solutions).

[22] *See*, Shapiro, *supra note* 14; *see also*, Heller *supra note* 7.

[23] A famous maxim spoken by Sir Isaac Newton put it each scientist that "stands on the shoulders of giants" to reach new heights.

discouraged.[24]

Many big companies already collect enormous amounts of data to predict, with high degree of accuracy, customers' future behavior by collecting massive information about them and analyzing products they purchase or consume. Disney World, for example, provides customers wrist bands, called "Magic Bands," which are equipped with RFID chips to track visitors' behavior. Visitors do many activities in the theme park, such as purchasing an identification card, entering an attraction; buying meals; and taking photos . Disney exploits the visitors' data to figure out meaningful patterns about customers' movements or consumption activities in the park. Although each personal datum has no strong signification, 50 million annual visitors might produce important data for managing Disney World or for future investment.[25]

The data produced by 150 million visitors annually is potent beyond efficient theme park management. However, the valuable data kept by their own gateways also create entry barriers for newcomers because the theme park keeps the data as an asset.[26] Google and Apple, the biggest mobile OS providers, also collect much data by smart phones, such as users' location and health status. It is disconcerting to hear the words that those large companies share this data with others. As described above, operating data or algorithms are the most essential assets for those companies. However, how many people are unwilling to accept these companies' use of their personal

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[24] *Id*.

[25] Bernard Marr, *Disney Uses Big Data, IoT And Machine Learning to Boost Customer Experience*, Fobes, Aug 24, 2017, *available at* https://www.forbes.com/sites/bernardmarr/2017/08/24/disney-uses-big-data-iot-and-machine-learning-to-boost-customer-experience/#64ca2e233876.

[26] Rubinfeld & Gal*, supra note 8* (analyzed characteristics of big data markets, including potential entry barriers, to analyze their competitive effects for social welfares and appropriate competition).

information as a price for gaining their services or products?

The anti-commons forces in intellectual property systems raise the risk of fragmentation that confining in the commercial activities.[27] According to Shapiro's research in the semiconductor industry, these companies can easily find unintentional infringements on their patents that result in injunctions or billions of dollars of liability.[28] Patent mining or submarine patents work like a toll booth, providing entry barriers to businesses against current or potential rivals. Such strong entry barriers allow rights-holders to control their industry or grant them bargaining powers in the market by imposing costly royalty fees. It is nonetheless to say that the unnecessary risk of innovation burdened raised by current business predecessors would decrease motivation of the innovation in the area.

Excessive transaction costs also provide opportunities for data-holders because royalties from intellectual property holders often exceed the actual value of the underlying assets. It is criticized the phenomenon so called "hold-up" which is an opportunistic behavior setting up deceive price or condition.[29] Because it usually occurs for specific assets that cannot easily be re-deployed for alternative uses, the owner makes an undeniable request.

The hold-up problem in IP between the right holders and users is easily predictable. The U.S. federal circuit court defined the relationship of hold-up, which occurs when the holder of intellectual property demands excessive royalties after using a standard.[30] The federal court

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[27] *See* Shapiro, *supra note* 14.

[28] *Id* at 121.

[29] OLIVER E. WILLIAMSON, THE MECHANISM OF GOVERNANCE 378 (Oxford University Press, U.S.A. 1999).

[30] Ericsson Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1209 (Fed. Cir. 2014).

considered the methodology calculating royalty based on reflecting a combination of incremental and depreciate value in market.[31] Nonetheless this problem happens frequently in various intellectual property markets and also will predictably occur in future markets when essential intellectual assets are held by a few holders.

Fortunately, the inefficient use of resources is not a unique problem in the IP area, and many efforts have been made to solve the problem. For example, some organizations have tried to resolve underuse problem and suggested meaningful solutions. Elinor Ostrom, the winner of the Nobel Prize in Economics, researched the governance of natural resource to analyze success in terms of the system's long-term survival.[32]

Scholars agree that self-ordained rule in use of resource that commonly appeared in the systems helped maintain its governance. They also enlarged upon her research to develop a theory of sustainable knowledge management by suggesting the appropriate intellectual property system to increase knowledge as a common possession.[33] This involves knowledge compiled over many generations without exclusion or other attempts to impede its spread. Most intellectual property law, like that pertaining to patents and copyrights, grants limited exclusions, however, the granting exclusive rights methods justify the right to use rather than that of ownership of the knowledge.

Governing common resources inspired various market and governmental management by suggesting the data as commons as a kind of a resource increase its benefits rather than limited resources this being done by only for the government or the market. Today, many governments

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[31] *Id* at 1226.

[32] *See* OSTROM, *supra note 10 at* 103–108.

[33] *Id* at 136.

open their data for the public interest and to facilitate governmental transparency.

The overall purpose of Open Government Data (OGD) is to strengthen democracy and promote efficiency in government.[34] Also, governments are looking to create new industries and markets by reusing combining existing data with scientific technology.[35] Since the development of data technology, it makes various process to interpret changes in our society. Governments collect a tremendous amount of data from a person's birth to his/her death so as to protect national security and promote the general welfare. At the same time, individuals and companies reuse the OGD and improve it, for example, Washington DC released public data and held a contest of reusing public data the "Apps for Democracy" in 2008 to provide databased public service.[36] Now, governments have begun to allow access to big data to encourage people to reuse it.[37] The open government data now needs to be considered in legal terms, especially as a matter of intellectual property law.

In addition, the sharing economy, like Uber and Airbnb, suggests a new private economic model that reduces unused resources.[38] To manage the sharing system, it is essential to develop a pool

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[34] *See* OBAMA ADMINISTRATION'S COMMITMENT TO OPEN GOVERNMENT STATUS REPORT, WHITE HOUSE, (2011), *available at* https://obamawhitehouse.archives.gov/sites/default/files/opengov_report.pdf

[35] *See* NIA, 2017 NATIONAL INFORMATIZATION WHITE PAPER, NIA (2017) *available at* https://eucyberdirect.eu/wp-content/uploads/2019/10/2017-national-informatization-white-paper.pdf

[36] *See*, *Gov 2.0: The Promise of Innovation*, Forbes, (Aug. 2009), *available at* https://www.forbes.com/2009/08/10/government-internet-software-technology-breakthroughs-oreilly.html#402d1a9d3b7b.

[37] Harlan Yu & David G. Robinson, *The New Ambiguity of "Open Government",* 59 UCLA L. Rev. Disclosure 178,198-200 (2012) (U.S. seeks agencies to "publish online in an open format at least three high-value datasets" via the new federal data portal at Data.gov. The European Union's 2003 Directive on the Re-use of Public Sector Information instructed that "[w]here possible, documents shall be made available through electronic means,""1 2 and the EU now operates a website and program to encourage member states to develop their own national data portals.).

[38] *See infra* Chapter III.

of data to accommodate existing resources. The data holders and pool managers need to consider the cautions discussed below to build a healthy system to organize data. Ostrom infers some principles from long-enduring practices in the management of common resources based on various successful cases.[39]

The OGD movement encourages social or economic action for enlarging common resources by broad access to government data.[40] OECD recommended two main elements that imply high governmental responsibility to enhance the public interest: (1) ”Government data” is defined as any data or information produced or commissioned by public bodies;[41] (2) “Open data” designates any data that can be freely used, modified, or distributed by anyone without any restrictions.[42]

As the development of data-analysis technology increases, OGD is expected to promote

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[39] Ostrom, *supra* note 10 Ostrom listed the principles: (1) Clearly defined boundaries; (2) Congruence between appropriation and provision rules and local conditions; (3) Collective-choice arrangements; (4) Monitoring (5) Graduated sanction; (6) Conflict-resolution mechanisms; (7) Minimal recognition of rights to organize ;(8) Nested enterprises. *infra* chapter 3

[40] OECD, OPEN GOVERNMENT DATA: TOWARDS EMPIRICAL ANALYSIS OF OPEN GOVERNMENT DATA INITIATIVES, OECD WORKING PAPERS ON PUBLIC GOVERNANCE, NO. 22, OECD PUBLISHING 4 (2013) (The paper categorized several characteristics of data which promising fields in OGD : Business information including Chamber of Commerce information, official business); Registers, patent and trademark information and public tender databases; Geographic information (including address information, aerial photos, buildings, cadastral information, geodetic networks, geology, hydrographical data and topographic information); Legal information (including decisions of national, foreign and international courts, national, legislation and treaties); Meteorological information (including climate data and models and weather forecasts); Social data (including various types of statistics on economics, employment, health, population, public administration); Transport information (including information on traffic congestion, work on roads, public transport and vehicle registration) *available at* https://www.oecd-ilibrary.org/governance/open-government-data_5k46bj4f03s7-en.

[41] *Id* at 6.

[42] *Id*.

transparency, accountability, and value creation.[43] Many OECD members have already reaped productive results from open-data utilization that engages with the private community. For example, the U.S. government realized an approximately 4,000% return on its App for Democracy project, and a Norwegian initiative developed 135 apps in a joint project of the government and the private sector.[44]

The U.S. government established Data.gov in 2009, which is owned and managed by the General Services Administration (GSA) and which has catalogued over 200,000 datasets.[45] On May 9, 2014, President Obama signed the Digital Accountability and Transparency Act (DATA), which states a new action to expand Federal spending transparency.[46] Clearly, many governmental bodies and private sector entities will need to concentrate on data management to achieve this goal. According to a report from the Government Accountability Office (GAO), data openness and making adequate data process improve decision-making and oversight.[47] The GAO suggests clear guideline for managing public records and for implementing an oversight process for agency records.[48] Ensuring the certain guidelines about datasets also pushes more private-sectors entities

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[43] *See* WHITE HOUSE, FACT SHEET: DATA BY THE PEOPLE, FOR THE PEOPLE, — EIGHT YEARS OF PROGRESS OPENING GOVERNMENT DATA TO SPUR INNOVATION, OPPORTUNITY, & ECONOMIC GROWTH (Sept. 28, 2016), *available at* https://obamawhitehouse.archives.gov/the-press-office/2016/09/28/fact-sheet-data-people-people-eight-years-progress-opening-government.

[44] OECD *supra note* 40 at 11.

[45] *Id* at 24.

[46] *Id.*

[47] *See*, Government Accountability Office, GAO-14-476, Data Transparency Oversight Needed to Address Underreporting and Inconsistencies on Federal Award Website (2014).

[48] *Id* at 27 ([T]he purpose of increasing transparency and accountability of federal expenditures requires that USASpending.gov contain complete and accurate information on applicable federal awards.).

to become new products, services, and improve the efficiency.[49]

The dissertation will suggest several different types of OGD, but they anticipate for the harmonized with healthy data pooling to encouraging pro-competitive big data industry. The high-entry barrier and underuse problem in the data market might continue. The legal system should support OGD as a potential solution to this problem and a way of supporting the public interest and competitive market When costs are kept low and there is high participation, OGD will be a powerful contributor to innovation in the data market, one that helps promote not only fair competition that results in individual benefits but also benefits for the entire society.

The big data industry and its markets are promising developments for the near future. Most of us already have enjoyed the advantages of big data, which has been provided to us, intentionally or unintentionally, by early service providers. The data users take the companies' harvesting of enormous personal data as a cost of the personal data service provided through the internet or smart phones. However, this tradeoff seemed unfavorable to other newcomers. As a result, they start to build high entry barriers to accessing data, resulting in the under-use problem. As a solution, I will consider OGD that results from sharing governmental data as the seed money of new data industry. It is necessary to grow market competitiveness and to increase public interests. Legal action for is an essential part of the data industry's efforts to promote procompetitive practices and human

[49] James Manyika, Michael Chui, Diana Farrell, Steve Van Kuiken, Peter Groves, and Elizabeth Almasi Doshi. *Open data: Unlocking innovation and performance with liquid information*, McKinsey, 2013, (McKinsey predicted about three trillion dollars already giving rise to hundreds of entrepreneurial businesses and helping established companies to segment markets, define new products and services, and improve the efficiency and effectiveness of operations.) *available at* https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/open-data-unlocking-innovation-and-performance-with-liquid-information

rights.

Since the data industry is young, its potential might become apparent in unexpected areas. McLaren data analysis team in Formula-1 racing, for instance, shared data analyzation methods or algorithms with pediatric hospitals in Birmingham, Great Britain.[50] A Birmingham hospital adopted 130 parameters and 15,000 health checkers supported by the McLaren system. As a result, by adopting Formula-1's data analyzing methods, the pediatric hospital could predict sign of irregular heartbeat 10 minutes earlier than was done by the methods it had used previously.[51] Formula-1 manufacturers had analyzed numerous data to cut the records off for the next race. (Of course, the system costs might be beyond the budget of a normal hospital.) As shown in this example, big data in one area can produce a surprising good when the method that produced it is applied to another area.

The expansion of intellectual property is justified when it enlarges the public domain. As Justice Brandeis claimed his dissent in *International News Service v. Associated Press*: "[t]he general rule of law is, that the noblest of human production – knowledge, truths ascertained, conceptions, and ideas – become, after voluntary communication to others, free as the air to common use."[52] Facts and ideas are valuable resources during each generation of innovation. Yet Brandeis' view, seems to go unheeded in the current IP industry, which assumes that any commons is inefficient, if not

[50] Jane Wakefield, *Formula 1 Technology Used in Hospital, BBC,* 30 July 2012, *available at* https://www.bbc.com/news/technology-18982474.

[51] Peter van Manen, *Better Baby Care: Thanks to Formula 1,* TED, Aug 2013, *available at* https://www.ted.com/speakers/peter_van_manen.

[52] International News Service v. Associated Press, 248 U.S. 215, 250 (1918) (Brandeis. J., dissenting).

tragic.[53] As subscribed above, the scope of IP increases with the development of scientific technology. A new attempt of intellectual property registration continuously the range of the noblest production even human bodies.[54] Besides, a stretched interpretation of IPR to moves to the more carefully designated rights over compilation facts linked with the profit of states.

Given the important role that big data will play in our modern knowledge-based economy, further scholars' analyses of such data will affect our society and welfare. Michael Mattioli has recommended that exclusive data rights should aim to strike a balance between data producers' desire to control downstream uses and the public interest in accessing data from big data users.[55] Therefore, governments should improve the interplay between public policy and private interests by designing pooling institutions; drawing clear boundaries of data in law; and encouraging participation of public.[56] As a result, data pooling could relieve the IP anti-commons problem by bringing data holders and data users together under a clear rule in use.

This dissertation also will follow previous IP sharing cases involving the government. Following the previous cases when IP possession rights and the public interest diverged, it will offer reasonable suggestions for current issues.

Patent pool provide relevant examples about this issue because their history involved similar situations, such as those addressed by current data policy. In the early 20th century, the U.S.

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[53] Boyle, *supra* note 12 at 40.

[54] *See in general*, Association for Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576 (2013).

[55] Michael Mattioli, *Disclosing Big Data,* 99 Minn. L. Rev.535,579 (2014).

[56] Michael Mattioli*, Communities of Innovation*, 106 Nw. U. L. Rev. 103,125 (2012).

government created the Manufacturer's Aircraft Association (MAA) to prepare for a war.[57] A few decades later, the DOJ established a per se illegal rule, called "Nine No-Nos," to regulate price fixing by a patent pool.[58]

In 1994, the DOJ and FTC revised patent pool regulation to try to strike a better balance between IP and anti-trust concerns. The accepted the rule of reason of the Antitrust Guidelines for the Licensing of Intellectual Property and applied antitrust law to the patent pool.[59] Some experts might argue that patents and data are different issues but these changes, along with private and public interests, will give an insight in the data industry either. Therefore, following the footprint and understanding context is helpful for future research.

Comparing the research on OGD in other countries will help us to understand the nature and uses of big data and to make reasonable proposals concerning it . Many developed countries organize data-sharing not only for promoting domestic industries but also for increasing governmental transparency. The paper will discuss the purposes of U.S.'s, Norway's, and South Korea's OGD services and how they contribute to pro-competitive markets. Also, international organizations like the OECD and World Intellectual Property Office ("WIPO") recommend universal suggestions for OGD as international views.

Ostrom's design principles can serve as useful guidelines on whether the pooling will be well-

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[57] *See*, Ryan Abbott, The Sentinel Initiative as a Knowledge Cmmons, *in* 6 GOVERNING KNOWLEDGE COMMONS (Brett M. Frischmann, Michael J. Madison & Katherine J. Strandburg eds. 2014).

[58] United States v. Line Material Co., 333 U.S. 287, 288 (1948).

[59] *See*, Thomas L. Hayslett III, *1995 Antitrust Guidelines for the Licensing of Intellectual Property: Harmonizing the Commercial Use of Legal Monopolies with the Prohibitions of Antitrust Law,* 3 J. Intell. Prop. L. 375 (1996).

organized well or not. As described above, Ostrom researched elements of healthy autonomous community and the principles that could explain how autonomous community can best utilize common resources. This framework might be applied to current OGD in many countries, whether their direction for public interests or not.

Finally, this dissertation will suggest theoretical approaches that will underlie legal suggestion and legal protections for government data, thus leading to practical approaches concerning open-data methods.

One must consider legal protections for open government data. Doing so reveals the obstacles of effective open-data policies and to governments viewing data as an asset. Beginning in 1992, the EU announced guidelines that extend copyrights protection called "*sui generis*", even if a database lacks originality but it is collected by quantitatively or qualitatively substantial investment.[60] The EU guidelines imply that the copyright system does not cover the whole area of database protection.[61]

The goal of data policy focuses on to promote transparency, accountability, participation, and economic development. In this regard, OGD is related to various kinds of IP protection. Trade secrets have the benefit of pooling information or knowledge.[62] Licensing government data is

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[60] Amended Commission Proposal for a Council Directive in the Legal Protection of Databases, 1993 O.J. (C 308) 1 (Mar. 11, 1996).

[61] *Id.*

[62] Mark A Lemley, *The Surprising Virtues of Treating Trade Secrets as IP Rights,* 61 Stan. L. Rev. 311, 319-322 (2008) (analyzed source of trade secret as protecting against the theft of proprietary information encourages investment in such information and deterrence of wrongful acts.).

needed to strike a balance between the government's costs in collecting data, and the reuse of databases.

III. The Tragedy of Anti-commons in Intellectual Property

This chapter analyzes several solutions to the tragedy of anti-commons from the perspectives of law and economics. The anti-commons approach arises in various social issues that prevent a procompetitive atmosphere in the market, leading to a suppression of fundamental human rights. In private area, the open data is received attention that enhancing the efficiency of data resources, for instance, sharing economy becomes a successful business model based on advanced technology. This chapter will look at the benefits of OGD in encouraging industrial development and

supporting human right.

A. The Necessity of Pooling Data for Cumulative Innovation

Most innovations are developed by remixing or supplementing existing technologies. In the process of continuous improvement, which also might be called cumulative innovation, innovations occur modifying existed methods or stuffs. The iPhone, for instance, one of the emblematic innovative products in the 21st century, was introduced as a music player, mobile phone, and internet communicator all at once. These technologies had existed for at least twenty to forty years when the device made. Despite this, the device was innovative because it opened smaartphones to different usage, as compared to the existing Nokia ones.

Cumulative innovation model has been model of technological. First, a considerable portion of the "new technology" already existed.[63] Besides, the new development often adopts numerous elements which used in different places and for other purposes.[64]. The internet was established for military communication in 1969; the mobile phone was first commercially available in 1983, and the first MP3 player was developed in 1998. The cumulative innovation model is the most common process of development in history and provides a reason for the protection of intellectual property that also allows the advancement of creative works by making accessible existing intellectual achievements.

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[63] Pamela Samuelson, Randall Davis, Mitchell D. Kapor & J. H. Reichman, *Manifesto concerning the Legal Protection of Computer Programs*, A, 94 Colum. L. Rev. 2308, 2329 (1994).

[64] *Id*.

In this regard, a place for sharable and reusable existed technologies and know-hows would spur faster innovations than would R&D on its own. As noted, durable IP protection might discourage innovators from pursuing their creative activities; also, there might well be a loss of innovation in the society resulting from large underuse.[65] On the other hand, relatively free access to existing research through cross-licensing or joint contract offers more opportunities to develop innovations and increase the total benefit.

B. The Problems of the Anti-Commons

1. Inefficiency: Entry Barrier and Underuse

Underuse of IP is a critical issue This problem contributes to structurally unfair competition because of the cumulative development of the data industry. It is related to the characteristics of big data, which is based on the quantitative necessity of a database to run. According to an FTC report, data go through four processes to deduce meaningful results: collection, storage, analysis, and usage (Figure 1).[66]In particular, the collection stage is an essential element for entry into the big- data industry. Without enough volume of data, no one can start a data business, even if he or she has the right creative idea.

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[65] *See* Richard R. Nelson, *Intellectual Property Protection for Cumulative Systems Technology*, 94 Colum. L. Rev. 2674 (1994).

[66] FTC Report, Big Data: A Tool for Inclusion or Exclusion, 23 (2016), *available at* https://www.ftc.gov/system/files/documents/reports/big-data-tool-inclusion-or-exclusion-understanding-issues/160106big-data-rpt.pdf

Figure 1: The data value chain[67]

Big data is not clearly defined but it is usually categorized according to three main characteristics: volume, variety, and velocity.[68] As the word itself, "big", "volume" refers to the mass quantities of data that organizations try to harness to improve their decision-making. If a high entry barrier challenges data-gathering in the market, that would be an efficient method to controlling the market.

The big-data industry might become aware of structural inequality which keeps new commers from joining the industry. Since the industry is based on a huge amount of data to manage the system, only a few of bigdata holders can initiate and enjoy the fruits of new resources. When a few data holders predominate, it is easy to go from there to organizing cartels or trusts, which are strictly prohibited under the law.

The situation seems very similar to early 20th century's patent pool problems, where patent holders organized large patent licensing institutions to regulate competition in the market.[69] The method might earn these institutions huge amounts of money but discouraged innovators from having endless possibilities and thus undermined the public good Similarly, today, the big- data

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[67] *Id*; *see also* Supra note 7 at 349.

[68] The definition of big data is not consent, but usually these 3Vs are common as characteristics. *See* OECD, DATA-DRIVEN INNOVATION FOR GROWTH AND WELL-BEING, (2014) *available at* https://www.oecd.org/sti/inno/data-driven-innovation-interim-synthesis.pdf. However, IBM listed added veracity to manage uncertainty; *see also* IBM, Analytics: Real-world use of big data in telecommunications https://www.ibm.com/downloads/cas/5JM9G2AV (2012).

[69] *See* infra Chapter 4

industry has created an unfavorable climate for start-ups, which find it is difficult to secure enough high-volume data. Only a few big companies, such as Google and Amazon, can provide convenient services collected by their own networks and then enlarge the gap of information.

The high entry barriers to data service might increase price discrimination against downstream consumers. Big data will predict the preferences of consumers faster and more precisely than ever. It is concerned about retaining a monopolistic use of data or engaged or strong price discrimination.[70] As a result, consumers and downstream suppliers would pay high price for accessing data that was determined by the giant data holders.

The possession problem in the database industry undermines the foundation of the intellectual property system about the anti-commons issue. IP laws grant various exclusive Eisenberg competition occasionally. Michael Heller has criticized upstream researchers in the biomedical market, in which excessive increased private rights restrict the use of materials and data.[71] This phenomenon is called "the tragedy of the anti-commons," which is named after Hardin's "tragedy of the commons".[72]

Eleanor Ostrom also maintained that the underuse of IP rights is worse than their overuse.[73] That is because it involves not only the total failure of IP legal institutes but also the failure to most efficiently use IP resources. The failure of underuse results in misfortune for rights-holders, who

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[70] Rubinfeld & Gal *supra* note 8 at 378.

[71] Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SC. 698, 698-99 (1998).

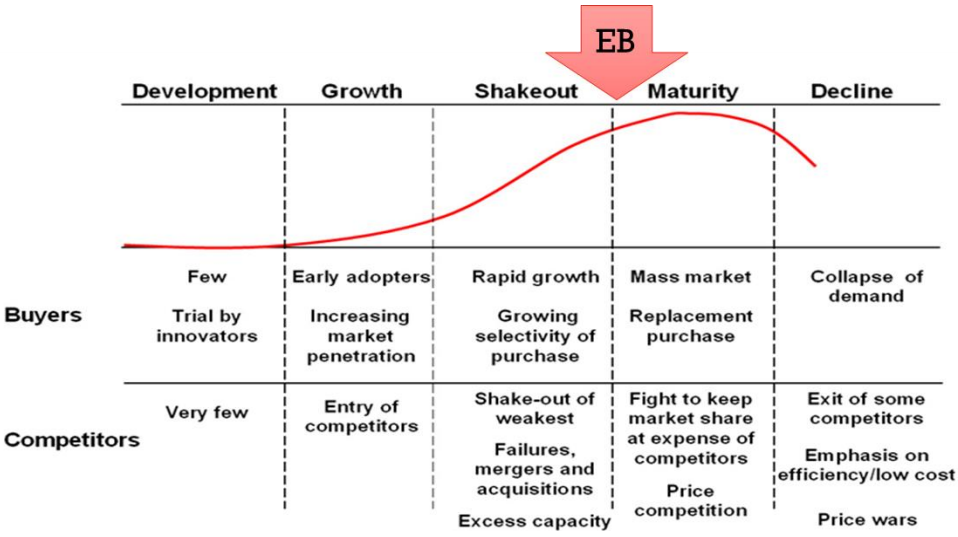
[72] *Id.*

[73] CHARLOTTE HESS, ELINOR OSTROM, UNDERSTANDING KNOWLEDGE AS A COMMONS: FROM THEORY TO PRACTICE, 4 (MIT Press, 2007).

deserve to earn their own and have a bad effect on the wider society because of the loss of innovation.

Any other industry has its own entry barrier so as to reward and safeguard the founder's efforts. However, the data industry's entry barrier comes too early-on to affect the whole industry. Most current intellectual protections, asserting excessive license fees or blocking patents, inhibit creative activities.[74]

Usually, new commers are welcome in the "solicitation stage" because their entrance is beneficial to growing the total value of an enterprise. Competitors try to build entry barriers afterwards when they believe the market in in between a shakeout and a mature stage, when market growth begins to slow. However, data-holders are reluctant to favor new competitors to keep their resources, even when the industry is growing fast.



[74] *See* Shapiro, *supra note* 14; *see also*, Heller *supra note* 7.

Figure 2. Usual entry barrier in industry life cycle[75]

In the view of the pioneers who have created new markets, the entry barrier might be viewed as compensation for early investment of the business that also prevents free- riders. However, the traditional entry barriers around IP, including access to databases, are not efficient in the market.

According to the Hardin's tragedy of the commons, the depletion of valuable resources occurs when the benefits of abusing the resources surplus the profit of keeping a regular rule. Compared to natural resources, knowledge is not depleted because of overuse through human actions. For instance, Beethoven's Symphony No.9 is not expandable, no matter how many people listen to it. Therefore, the tragedy of the commons would not happen in the IP industry because of overuse.[76]

Moreover, intellectual products contribute to later productive activities. Cumulative innovations that came from using the scientific methods by harnessing many previous findings for future discoveries or inventions.[77] The power of big data can create innovative synergies by utilizing data from different sources. The big data industry has utilized data not only in the original field for which it as collected but also to conceive of new possibilities in other fields.

2. Open Data as a Fundamental Right

Being able to access public knowledge guarantees fundamental rights in practical matters in our legal system. For example, approaching legal information for free should be considered as a human

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[75] *See in general, Industry life cycle, available at* https://johnsohn.dk/2019/08/02/lifecycle-industry/ (last visited Jul. 9, 2020).

[76] *See* Hardin, *supra note* 21.

[77] A famous maxim spoken by Sir Isaac Newton put it each scientist that "stands on the shoulders of giants" to reach new heights.

right and self-defense, though digitalized legal information services have failed to satisfy the needs of citizens.[78]

Scholars continuously criticize the overbroad assertion of copyright for restricting information in the public domain.[79] It is crucial for government to allow citizens to have free access to the law as a practical policy in the name of due process.[80] When considering current online legal services in the U.S., the main problem results from lack of an accessible model in public place rather than technical limitation. The government is the essential party whose role should be to guarantee public access to cases and publications..[81]

The presumption of courts around the worlds, including in the U.S., is that ignorance of the law is no excuse. Therefore, a fundamental assumption of the legal system is that that citizens have an obligation to understand and comply with the law or hire experts to do so.[82] Instead, a recent U.S. court clearly declared the no-excuse principle and in favor of free access to legal materials.[83]

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[78] Leesi Ebenezer Mitee, *The Right of Public Access to Legal Information: A Proposal for its Universal Recognition as a Human Right*, 18 GERMAN L.J. 1429, 1431 (2017).; *see also* David S. Ardia, *Privacy and Court Records: Online Access and the Loss of Practical Obscurity*, 2017 U. ILL. L. REV. 1385 (2017).

[79] *See* Paul J. Heald, *Payment Demands for Spurious Copyrights: Four Causes of Action*, 1 J. Intell. Prop. L. 259 (1994); *see also* Jason Mazzone, *Copyfraud*, 81 N.Y.U. L. Rev. 1026 (2006).

[80] Bldg. Officials & Code Adm. v. Code Tech., Inc., 628 F.2d 730,734 (1st Cir. 1980).

[81] *See* IFLA Statement on Government Provision of Public Legal Information in the Digital Age (2016), *available at* https://www.ifla.org/publications/node/11064 (recommending all governments provide access to legal information in a digital format for free to the public and that such information be authentic and preserved); *see also* Ralph Nader, *The Law Must be Free and Accessible to All. Not Secret and Profitable,* Huffington Post *available at* https://www.huffingtonpost.com/ralph-nader/the-law-must-be-free-and-accessible_b_4747745.html.

[82] *See* Ronald A. Cass, *Ignorance of the Law: A Maxim Reexamined*, 17 Wm. & Mary L. Rev. 671 (1976).

[83] Nash v. Lathrop, 6 N.E. 559, 560 (1886) (The court held that " Every citizen is presumed to know the law thus declared, and it needs no argument to show that justice requires that all should have free access to the opinions…");

Technological developments around legal materials limit the amount of print resources. This ironically might make access to resources more difficult for self-represented litigants.[84] Digitalized legal materials might be preferred to legal professionals or others who can afford to access them by paying usage costs. However, most self-represented litigants have difficulty not only hiring lawyers' help but also using digital devices to access important legal resources.[85] This is because current public libraries are not affordable to pay licensing fee to the legal publishers, so libraries have difficulty to deliver essential information like law. The "digital divide" issue becomes severe among older, less educated, and less affluent populations.[86] Considering the importance of the adversarial system in civil court, the accessibility of information is a fundamental human right, however the current digitalized system makes difficulties to making a desperate accessibility of the publics.

3. Knowledge as a Commons Movement

An attempt to compare information and common resources received attention as scholars have begun to find similar problems between natural resources and intellectual property, like free-riding

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see also Bldg. Officials v. Code Tech., *supra note* 80 (the law is generally available for the public to examine, to have constructive notice of then everyone may be considered it; any failure to gain actual notice results from simple lack of the law is limited, then the people will diligence. But if access to or may be unable to learn of its requirements and may be thereby deprived of notice to which due process entitles them.).

[84] *See* Kimberly Mattioli, *Access to Print, Access to Justice*, 110 Law Libr. J. 31, 33 (2018) (arguing self-represented litigants have less access to legal materials due to the shrinking print collection in public library.).

[85] *Id* at 48.

[86] COUNCIL OF ECONOMIC ADVISERS, MAPPING THE DIGITAL DIVIDE ISSUE BRIEF 4, (July 2015), *available at* https://obamawhitehouse.archives.gov/sites/default/files/wh-digital-divide-issuebrief.pdf.

or overuse of the internet.[87] Many social scholars have participated in research about the cyberspace and information communities as a new kind of commons.[88] The legal profession, in particular, has focused on trying to find solutions for chronic issues in the intellectual property area, especially around excessive possession, commercialization, and underuse of information.[89]

Knowledge in digital ear are ensuring much greater accessibility compare to analogue ways. In this regard, knowledge commons movement suggests shared access to physical or digital resources for build effective forms of self-organizing, non-subtractable multiple users can enjoy the same digital resources. Davenprot & Prusak note that "Knowledge is derived from information, just as information also is derived from data"[90]. They argue that data is the source of information, and information results from the manipulation of data by those with a certain background, and

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[87] CHARLOTTE HESS & ELINOR OSTROM, *Introduction: An Overview of the Knowledge Commons in* UNDERSTANDING KNOWLEDGE AS A COMMONS: FROM THEORY TO PRACTICE, 3, 5 (Charlotte Hess & Elinor Ostrom eds., 2006).

[88] *See* Charlotte Hess, *Is There Anything New Under the Sun? A Discussion and Survey of Studies on New Commons and the Internet*, (referring the Internet is a fairly common pool resource which enables rapid transfer of information and communication.) *available at* http://dlc.dlib.indiana.edu/dlc/bitstream/handle/10535/384/iascp2000.pdf?sequence=1&isAllowed=y, *see also* Joseph S. Nye, Jr., *Cyber Power*, HARV. BELFER CTR. 15 (2010), *available at* https://www.belfercenter.org/sites/default/files/files/publication/cyber-power.pdf (describing that cyberspace domain is often related to a public good or a global commons).

[89] Mark A. Lemley & Lawrence Lessig, *Open Access to Cable Modems*, 22 Whittier L. Rev. 3 (2000) (relationship to the competitive environment that the Internet has created); *see also* Kristen Eichensehr, *The Cyber-Law of Nations,* 103 Geo. L.J. 317 (2015) (applying international agreement of global commons in cyberspace.); s*ee also* SCOTT J. SHACKELFORD, MANAGING CYBER ATTACKS IN INTERNATIONAL LAW, BUSINESS, AND RELATIONS IN SEARCH OF CYBER PEACE, (Cambridge University Press ed.) (2014) (analyzing cyberspace as a pseudo common compare to traditional commons).

[90] *See in general* T.H. DAVENPORT AND L. PRUSAK, WORKING KNOWLEDGE: HOW ORGANIZATIONS MANAGE WHAT THEY KNOW, (HARVARD BUSINESS SCHOOL PRESS) (1998).

knowledge..[91]

The view of knowledge as a commons issue is represented in the view of classical economists that commons are properties which are nonexclusive.[92] In this view, knowledge comes under the category of the commons because it is differentiate contributions between oneself and others'.

Knowledge accumulates for many years without exclusion and no one can control its spread. Though patents and copyrights might be used for exclusive purposes, these methods are justifiable only when limited rights to usage contribute to the future development of new intellectual or other resources. Scholars who have researched natural resource governance focused on elements that sustain the system.[93] They point to some elements that commonly appeared in the system and helped maintain its governance. These factors suggest appropriate guidelines for how an intellectual property system can practically manage knowledge.[94]

a. Providing Information

Qualitative information management is a prerequisite for information sharing and reasonable decision-making. The process includes expeditious data-gathering and management, also those data need to keep the latest status from frequent external update. Data management usually is organized by the government because of its large quantity. The popularity of a body of knowledge in a specific area or in the public domain might be an important indicator of how the knowledge

[91] *Id* at 164.

[92] Paul A Samuelson, *The Pure Theory of Public Expenditure,* The Review of Economics and Statistics, Vol. 36, No. 4, 387, 389 (1954).

[93] Ostrom *supra note* 10 at 103–142.

[94] *Id* at 136.

affects to the society.

b. Dealing with Conflict

Conflict resolution method is an essential element in resource management. Most conflicts help us understand other views, though in extreme cases, they can collapse the system. Members can build strong relationships when they follow a designated process to solve a conflicts and dispassionately understand the other side. Motivation builds a sustainable repository of knowledge to share new knowledges as a commons source for scientific development. A reasonable level of incentives and rules is vital in maintaining the active participation of researchers and writers in this process..[95]

c. Inducing Rule Compliance

Effective governance requires rules that generally adopt reasonable standards for dealing with errors, forgetfulness, and urgent problems.[96] It is generally effective to impose modest penalty on first offenders, and gradually impose more sanctions when additional injury is committed by the same person it must keep in mind that rules exist for efficient and sustainable management rather than for their own sake..

d. Supplying Infrastructure

Infrastructure affects the sustainable use of common resources methods and rule for actual users. Sustainable infrastructure not only meets the demands of participants for providing, the adequate management and usage of resources but also preserves resources for future generations.[97] The

[95] *Id* at 131.

[96] *Id* at 133.

[97] *Id* at 129.

sustainability of knowledge resources means a system will keep offering these resources independently accessibility to the system. To attain system sustainability of the system, approaches are needed that maintain a balance between long-term goals and updates of new technology.[98] In particular, it influences directly to the data savings and applications therefore, the infrastructure must be considered include other infrastructure systems related to fields.

e. Equivalence

As with many other things, resources must be distributed equitably. Therefore, their must be based upon a reasonable calculations about contributions for governance. On the other hands, individuals would pay for resource as an alternative way to efforts. Elinor Ostrom has suggested two principles to achieve greater equity: (1) an individual's contributions must contribute to the effort for resource governance of resources, while (2) taking into account different abilities to pay for property.[99]

The redistribution of knowledge is also an important policy that is needed to overcome differences in access to information. Information-sharing is important not only because it necessarily leads to a redistribution of wealth but also because overcoming the information gap, which is central to human rights. Therefore, the redistribution of the knowledge must be considered as a basic form of equity.

[98] *Id* at 130

[99] *Id* at 134.

C. The Sharing Economy Increases Efficiency by Reducing the Amount of Idle Resources

Around late 2000s, several sharing-economy business models, such as Uber, Lyft, and Airbnb, proved successful. . These companies suggested a new sales model for reducing idle resources..[100] The new business platforms almost do not need additional investments because they can just increases the efficiency of original property.

John Zimmer, Lyft's co-founder, maintains that that the service the company provides is pleasant experience to customers and, also increases the number of available seats for private transportation.[101] According to him, the entire rate of utilization of vehicles in the U.S is only around 4%, which means that the all Americans utilize about 1% of car seats but they pay 13% of GDP of the country.[102] The virtue of these sharing services is that generate additional profits, activating idle resources to those who most need them.[103]

The sharing economy has inspired many scholars to note that it provides high-efficiency alternatives to current economic practices. Rachel Botsman and Roo Rogers write about a broad shift in consumption patterns from the twentieth to the twenty-first century.[104] They compare the "hyper consumption" for the most consumers in the twentieth century to the "collaborative

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[100] *See* ARUN SUNDARARAJAN, THE SHARING ECONOMY: THE END OF EMPLOYMENT AND THE RISE OF CROWD-BASED CAPITALISM (The MIT Press, 2017).

[101] *Id* at 10 (The CIO of Lyft mentioned that the success of the business that providing a delightful experience and having high occupancy.)

[102] *Id*.

[103] Lyft and Airbnb might a begging of the sharing economy, *see* e.g. Joe Queenan, *A Sharing Economy for Pants, Hats and More*, THE WALL STREET JOURNAL, July 13, 2017, *available at* https://www.wsj.com/articles/a-sharing-economy-for-pants-hats-and-more-1499960124 (last visited Sep. 10, 2019).

[104] *See* RACHEL BOTSMAN & ROO ROGERS, WHAT'S MINE IS YOURS: THE RISE OF COLLABORATIVE CONSUMPTION (HarperCollins Publishers, 2010).

consumption" that will become predominant in this century,[105] including people sharing their experiences via the internet..[106] Lisa Gansky, also has shown how cutting-edge information technology has increased the efficiency of resource allocation;[107] it decreases efforts to exploit natural resources for the sake of economic growth.[108] Using online tools, the sharing economy contracts with commercial parties in making accessible and employing underutilized assets to a broad community, thus leading to a reduced need for ownership of those assets.[109]

However, these and other efficiency factors are not enough to explain the rise of the sharing economy. Since Henry Ford begun to sell mass-produced cars in 1908, the use of idle resource was not a major business concern. People preferred to purchase their own vehicles rather than share them. Carpools or hitch-hiking failed to become popular practices, especially when compared to the current sharing services.

What is the reason that those using current sharing services trust that Lyft driver will offer a reliable service? Sundararajan analyzed the ties between Facebook friends in cyberspace. The current internet-based businesses were developed in part for consumers to share information about their experience as members of a community.[110] Customers can write a review about their shopping experience and doing so immediately influences the company's reputation and other customers' decisions on whether to use its services.

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[105] *Id*.

[106] *Id*.

[107] LISA GANSKY, THE MESH: WHY FUTURE OF BUSINESS IS SHARING, 11 (Penguin 2010)

[108] *Id* at 26.

[109] Sundararajan, supra note 100 at 44

[110] *Id*.

Benkler analyzed how the current sharing economy was established based on social relationships rather the allocation of capital resources.[111] The system is not based on a brand-new economic model but rather is influenced by improvements of new technologies and of traditional system that largely disappeared during the industrial revolution.[112] One should recognize that the new technologies enhanced the efficiency of the current economy, which rather than massive producing.[113] The sharing economy is a result of better exchange system that is enhanced by better technology, not the restoration of virtue in human minds. The sharing economy has a dynamic that influences our lifestyle and the direction of public policy as well.[114]

Personal motivation is an important element in the sharing economy. Compared to the motivation in a typical industry, the sharing economy encourages individuals to communicate with others. For example, thumbs up in Facebook is often an expression of approval and/or sympathy with another person. The clicking action does not necessarily produce any profit, but the process constitutes one of the most successive business models today.[115]

Thumbs-up and other icons work as a clear barometer for who seeking to understand market trends or to connect suppliers to customers. Therefore, communication that doesn't directly

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[111] Yochai Benkler, *Sharing Nicely: On Shareable Goods and the Emergence of Sharing as a Modality of Economic Production,* Yale Law Journal 114, no.2, 273, 305 (2004).

[112] *Id* at 311.

[113] *Id* at 278.

[114] *Id* at 343.

[115] Transcript of Mark Zuckerberg's Senate hearing, Transcript courtesy of Bloomberg Government, WASHINGTON POST, April 10, 2018 *available at* https://www.washingtonpost.com/news/the-switch/wp/2018/04/10/transcript-of-mark-zuckerbergs-senate-hearing/ (Zuckerberg testified Facebook makes profit through advertisement about 98 percent across Facebook and Instagram.).

lead to profits indirectly contributes to the faster transfer of capital from consumers to enterprises. It does not a signal which directing the declining of modern capitalism, besides the more creative business models continuously suggest the more commercial attempts by using sympathy.

D. Open Government Data as a Suggestion

1. Overview of OGD

Sharing valuable data movement works well not only in the private sector but also is used by governments to inform and enrich the public sectors. Every government around the world collects an enormous amount of data that covers important environmental, educational, scientific, demographic, transportation, tourism, health insurance, crime, occupational safety, product safety, and other developments .[116] In short, government is the biggest data producer in the big-data industry, Former President Barack Obama described data as a "national asset" . and the increasing value of data's in important social and economic developments reveals [117]

Because of various political reasons like industrial development and enhanced public service, OGD has becomes a widespread governmental practice in many countries. In fact, numerous countries have implemented policies to release much of their data to the public or otherwise to

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[116] Keiran Hardy & Alana Maurushat, *Opening Government Data for Big Data Analysis and Public Benefit*, 33 COMPUTER L. & SECURITY REV. 30, 31 (2017); *see also* OECD, *supra* note 40.

[117] THE WHITE HOUSE OFFICE OF THE PRESS SECRETARY, OBAMA ADMINISTRATION RELEASES HISTORIC OPEN DATA RULES TO ENHANCE GOVERNMENT EFFICIENCY AND FUEL ECONOMIC GROWTH, OBAMA WHITEHOUSE ARCHIVE (May 9, 2013), *available at* https://www.whitehouse.gov/the-press office/2013/05/09/obama-administration-releases-historic-open-data-rules-enhance-government.

encourage people to gain access to and use and reuse government data.[118]

For example, The Digital Agenda for Norway (also known as the "White Paper") stressed using digital technologies to modernize, simplify and otherwise improve public-sector data processes and external outputs.[119] To enhance citizens' lives and increase business productivity, the White Paper demanded reusable, machine-readable form of governmental data.[120] According to Sir Tim Berners-Lee, suggested a 5-star deployment scheme, machine-readable format occupied stage 2 that directly process data through a proprietary software and combine it into another structured format.[121] The Norwegian government has shown a willingness to capitalize on the availability and analysis of new digital technology like big data and to design enhanced public services and data-driven policy solutions to existing problems.[122]

★	make your stuff available on the web (whatever format)
★★	make it available as structured data (e.g., excel instead of image scan of a table)
★★★	non-proprietary format (e.g. csv instead of excel)

[118] *See* OECD *supra* note 40.

[119] OECD, DIGITAL GOVERNMENT REVIEW OF NORWAY: BOOSTING THE DIGITAL TRANSFORMATION OF THE PUBLIC SECTOR, 9, OECD DIGITAL GOVERNMENT STUDIES (2017) *available at* https://www.oecd.org/gov/digital-government/digital-government-review-norway-recommendations.pdf (last visited April 3, 2020).

[120] *Id.*

[121] Sir Tim Berners-Lee, The 5 stars of open linked data, inkdroid, (*available at* https://inkdroid.org/2010/06/04/the-5-stars-of-open-linked-data/)

[122] OECD, DIGITAL GOVERNMENT STRATEGIES FOR TRANSFORMING PUBLIC SERVICES IN THE WELFARE AREAS, 29 OECD COMPARATIVE STUDY, (2016), *available at* http://www.oecd.org/gov/digital-government/Digital-Government-Strategies-Welfare-Service.pdf

★★★★	use URLs to identify things, so that people can point at your stuff
★★★★★	link your data to other people's data to provide context

Figure 3 Five Star Scheme [123]

Governments also have begun to make accessible big data for public to promote industrial innovation. According to its "Open Data Action Plan" which was announced in 2014, the American government stated several principles about readily releasing date, and doing so in an easily machine-readable ways. It also stated that it is a priority to have open data in accordance with citizens' demands and open data accepted by feedbacks from innovative groups and to otherwise support these groups.[124]

The Japanese government established 'Active Japan' as a new Information and Communications Technologies (hereafter. "ICT") strategy.[125] In this plan, big data is categorized as something that can contribute to significant social and economy development. Active Data contains data open to the public; research and development on big data; training talented individuals in accumulation, analysis, and reuse of data experts; loosening regulations to allow for greater access to the government database; building cooperation between universities and the government and

[123] Lee *supra* note 121.

[124] *See* U.S. GOVERNMENT, U.S. OPEN DATA ACTION PLAN, *available at* https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/us_open_data_action_plan.pdf (last visited 2018. 02. 24)

[125] NATIONAL ASSEMBLY RESEARCH SERVICE, Big Data jeongchaek mit choojin hyunhwanggwa hwalyondo jegobangan [Current Status of Big Data Policy Implementation and Measures to Improve Utilization], Legislation & Policy Report 2 (May 31,2018) (S. Korea).

evaluation of the results. To fulfill these goals, the government invested significant funds in the industrial environment and to train experts in data collection and management.

The EU has discussed criteria for an effective data policy because it has tried to protect database before big data raised. The EU announced guidelines for database protection, which granting a copyrightability to a database not fulfilling originality so called *"Sui Generis"*. The EU Council released its first guideline in 1992, which implied that the copyright system does not cover the whole area of database protection.[126]

After several debates for database protection, the EU Council adopted a policy granting *sui generis* right to those who have invested substantial amount of effort to creating databases. By doing this database owners would prevent non-approved access, extraction, or re-utilization of the database/. Therefore, the standard of "substantiality" of the investment becomes an important legal criterion for granting *sui generis*.[127]

As described above, many countries recognized databases as an important national asset that advances their interests. Therefore, the movement will be operated with great responsibility by government as an important political work.

2. The Ambiguous Goal of OGD in Data Policy

The goal of OGD encourages social or economic participation in accessing databases, which it views as a public right.[128] OGD consists of two main elements First, government data means

[126] Amended Commission Proposal for a Council Directive in the Legal Protection of Databases, *supra* note 160.

[127] Xuqiong (Joanna) Wu, *E.C. Database Directive*, 17 Berkley Tech L.J. 571, 574 (2002).

[128] *See* OECD *supra* note 40

any data or information produced or commissioned by public bodies.[129] Second, "open data" designates any data that can be freely used, modified, or distributed by anyone without restrictions.[130]

The OGD processes aims to improve governmental transparency, citizen rights, innovation, and harmonization with new technology. The G8 Open Data Charter announced six fundamental data principles below: (1) Open by Default; Timely and Comprehensive; (2) Accessible and Useable; (3) Comparable and Interoperable; (4) Promoting Improved Governance and Citizen Engagement; and (6) Stimulating Inclusive Development and Innovation.[131]

Clearly, the future value of the volume of governmental data will be increasing big data as part of the big-data trendm and this data will be an increasingly important source for entrepreneurship and economic growth.[132] Government is the main stakeholder of OGD, not only a data publisher to the public, which because of big data can expect greater efficiency in government operation.[133] The organized datasets will allow more efficient and personalized public services based on better interaction between the governments and users.[134] If the government is able to increase in transparency between itself and citizens through this process, it will gain more solid legitimacy from the broader society.[135]

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[129] *Id* at 6.

[130] *Id*.

[131] OPEN DATA CHARTER, *available at* https://opendatacharter.net (last visited on Mar. 2, 2018).

[132] *See in general,* Michael Chui*., Generating Economic Value Through Open Data,* in BEYOND TRANSPARENCY: OPEN DATA AND THE FUTURE OF CIVIC INNOVATION 163, 163 (Brett Goldstein & Lauren Dyson eds., 2013).

[133] OECD *supra note* 40 at 6.

[134] *Id*.

[135] *Id*.

As the developer of data analysis technology, OGD is expected to promote transparency, accountability, and value creation.[136] Many OECD members reaped noteworthy results from open-data utilization engage with the development community. For example, the American government invested in public data-application project and got an approximately 4,000% return on investment in its Application for Democracy project; similarly, Norwegian initiative developed 135 apps in joint work with the government and private sectors.[137]

in 2009, the American government established Data.gov, which is owned and managed by the General Services Administration (GSA) and which has catalogued over 200,000 datasets.[138] On May 9, 2014, President Obama signed the Digital Accountability and Transparency Act (DATA Act), which stated a new commitment to expand Federal spending transparency.[139] A growing trend is that many government and private- sector entities concentrate on data management for securing better function in working places.

The GAO emphasized that open data openness an adequate data-making process would improve decision-making and oversight.[140] It also recommended clear guideline for managing publics record and implementing oversight process in agency records.[141] Ensuring these and other guidelines about datasets also encourages the private sector to engage more in innovation.[142]

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[136] *See* WHITE HOUSE *supra* note 43.

[137] OECD *supra* note 40 at 21.

[138] *Id.*

[139] *Id.*

[140] *See*, GOVERNMENT ACCOUNTABILITY OFFICE, *supra* note 47.

[141] *Id* at 27 ([T]he purpose of increasing transparency and accountability of federal expenditures requires that USASpending.gov contain complete and accurate information on applicable federal awards.).

[142] James Manyika, Michael Chui, Diana Farrell, Steve Van Kuiken, Peter Groves, and Elizabeth Almasi Doshi. *Open*

Private companies expect public services to be designed and delivered in a simple and convenient way, embedding a user-driven perspective, re-using information previously provided, and being available in multiplatform alternatives. OGD can stimulate a competitive marketplace and stimulate the creation of new services using government data.

When information is provided to the public for free or at a very low cost, developers and private enterprises are able bring new, value-added products or services to market.[143] For instance, Propeller Health, collaborated with CDC sharing asthma outbreaks data in real time and create a system that could predict exacerbations.[144] This private company monitors inhaler usage by asthmatics to identify patterns of medical device use by merging usage data with CDC information about environmental triggers of asthma.[145] Propeller Health helps to develop personalized treatment plans and to expose potential dangers to those suffering from asthma.. OGD is expected to help citizens to improve their quality-of-life. Because of the faster dissemination quantitative of

data: Unlocking innovation and performance with liquid information, McKinsey, 2013, (McKinsey predicted about three trillion dollars already giving rise to hundreds of entrepreneurial businesses and helping established companies to segment markets, define new products and services, and improve the efficiency and effectiveness of operations.) *available at* https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/open-data-unlocking-innovation-and-performance-with-liquid-information

143 *See*, EUROPEAN COMMISSION, REVIEW OF RECENT STUDIES ON PSI RE-USE AND RELATED MARKET DEVELOPMENT, (2020) *available at* https://ec.europa.eu/digital-single-market/en/news/review-recent-studies-psi-reuse-and-related-market-development.

144 Greg Licholai, *Digital Company Propeller Finds Success with Public Health,* FORBES, (Jul. 1, 2019), *available at* https://www.forbes.com/sites/greglicholai/2019/07/01/digital-medicine-company-propeller-success-public-health/#19f2f8113661.

145 *Id.*

public information, which allows people to access more information and knowledges from diverse sources, they can have more social engagement,.[146]

OGD is based upon the right to information for the public, which is viewed as a human right. From a democratic perspective, OGD is expected to help the public to better understand how well its government works, and to increase its ability to monitor its functioning. And now individuals begin to use government data as another usage, which will enhance their decision-making capability. The other usage claims of the public domain would beneficial to society by creating dynamic conditions in industry and participatory democracy.

FiscalNote is a notable example for "combining public data with AI to predict the faate of proposed legislation. This start-up company predicted the fate of a bill with 94% accuracy using a data-based approach.[147] It correctly predicted that Moon Jae-In would be elected the president of South Korea in 2017 as a result of special presidential election because of the impeachment of former President Park Geun-Hye.[148]

3. OGD as a Fundamental Right

Interestingly, the demand that the public be able to access governmental data is not new.. The term "open government" was developed in the U.S. in 1the 1950s to criticize and monitor the great

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[146] *See* e.g. "Fix My Street" in UK, "CHI311" in Chicago have meaningful achievements to interact with government and citizens using the public data.

[147] Jeff J. Roberts, *This Startup Just Got $10M to Predict Politics with Tech*, FORTUNE (2016) *available at* https://fortune.com/2016/02/02/fiscalnote-seriesc/

[148] Elaine Ramirez, *How This Entrepreneur Is Helping South Koreans Pick Their Next President*, FORBES, (2017) *available at* https://www.forbes.com/sites/elaineramirez/2017/05/07/south-koreas-techie-activists-are-helping-netizens-keep-candidates-in-check/#23ac9b35a04c자

degree of executive power after the Great Depression and World War II.[149] At that time, ,controlling information control was necessary for national security, and information technology developed dynamically with computer technology.

Wallace Parks has argued that in a democratic system, the accessibility of information held by the executive branch and administrative agencies must be secure. .[150] But he also has criticized the actions of government agencies that have collected information of individuals or private organizations that goes beyond legitimate investigative purposes..[151] Besides, the broad administrative power conflicts with the constitutional "right to know."[152]

James Madison was concerned that if the people lacked adequate information, there would be insufficient safeguards against an authoritarian government.[153] In the discussion of the constitutional amendments that became the Bill of Rights, some of the Founders stated strong reasons for access to government information in their arguments for what to be the First and Ninth Amendments, though the U.S. Supreme Court had never dealt with the definition of government data directly. However, these two amendments decree equal standing with other specified rights.[154]

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[149] Wallace Parks, *Open Government Principle: Applying the Right to Know Under the Constitution*, 26 Geo. Wash. L. Rev. 1 (1957).

[150] *Id* at 3.

[151] *Id* at 5.

[152] *See* Harold L. Cross, THE PEOPLE'S RIGHT TO KNOW: LEGAL ACCESS TO PUBLIC RECORDS AND PROCEEDINGS (Oxford U. P 1953), (The Constitution imposes government's obligation to publish information to congress (Article I, §5 & Article I, §9). It is semantically identical (or nearly so) to a public right to know it.)

[153] "A popular government without popular information or the means of acquiring it is but a prologue to a farce or tragedy, or, perhaps both." Quoted in Lassweli, National Security and InidivIdual Freedom 63 (1950).

[154] U.S. CONST. amend. IX: "The enumeration in the Constitution, of certain rights, shall not be construed to deny or disparage others retained by the people."

The new kind of rights, also might be considered as basic, although the right to access to governmental information was not written into the Constitution..

The First Amendment prevents governmental interference with the communication of facts and views about governmental affairs. The Supreme Court holds that the exercise is an aspect of the basic rights and responsibilities of citizenship in a free society.[155] Parks mentioned that the Supreme Court already has guaranteed the people's right to know as a fundamental basis upon which popular sovereignty is based.[156]

Freedom of the press includes not only the right to publish but also the right to prepare writing, which includes gathering information.[157] In *Bridges v. California,* the Supreme Court admitted a liberal interpretation for maximum freedom in explicit language in the context of a liberty society that allow.[158] Also, *Near v. Minnesota*, which is about an issue of a printing license, held that the government is allowed to restrain a free press only in exceptional circumstances, even there is a

[155] U.S. v. Cruikshank, 92 U.S. 542, 552 (1876) (the Court interpreted these rights broadly in the following language: "The right of the people peaceably to assemble for the purpose of petitioning Congress for a redress of [their] grievances, or for anything else connected with the powers or the duties of the national government, is an attribute of national citizenship and as such under the protection of and guaranteed by the United States.)

[156] Parks *supra note* 149 at 7.

[157] Grosjean v. American Press Co., 297 U.S. 233, 246 (1946) ("The predominant purpose … to preserve an untrammeled press as a vital source of public information. The newspapers, magazines and other journals of the country, it is safe to say, have shed and continue to shed, more light on the public and business affairs of the nation than any other instrumentality of publicity, and, since informed public opinion is the most potent of all restraints upon misgovernment, the suppression or abridgement of the publicity afforded by a free press cannot be regarded otherwise than with grave concern.").

[158] Bridges v. California 314 U.S. 252, 263-65 (1941) ([t]he First Amendment must be taken as a command of the ... broadest scope that explicit language, read in the context of a liberty loving society will allow.).

precedent for doing so.[159]

An upsurge in the right to know as a fundamental occurred right after World War II, when the Supreme Court reaffirmed the executive and legislative branches responsibility for open government.

> The Constitution has left the performance of many duties in our governmental scheme to depend on the fidelity of the executive and legislative action and, ultimately, on the vigilance of the people in exercising their political rights.[160]

The early Open Government movement focused on securing the right to know as a constitutional right to petition the government. Legal leaders recognized that the collection and distribution of information are the backbone of rational thought during economic crisis and war. Besides, access to government information contributes to a successful democratic system, one where the people can monitor the activities of competing political parties.

These efforts for open government finally bore fruit for the Freedom of Information Act (FOIA) of 1966.[161] The movement for transparent government continues as the main current goal of OGD.

Because of efforts to access the public information, people can request government-held information through an administrational process, arguing that it is needed for the public interest. Today, attempts at accessing government data often receives attention as trying to provide a

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[159] Near v. Minnesota 283 U.S. 697, 716 (1931).

[160] Colegrove v. Green, 328 U.S. 549, 556 (1946).

[161] *See*, The Freedom of Information Act (FOIA), 5 U.S.C. § 552 (1966).

valuable resource. Private companies keep knocking at the door to open data as a right to know government information or freedom of information to appropriate parties releasing the government data.[162] Jerome H. Reichman and Pamela Samuelson have predicted that the acquisition of scientific data will depend on the price paid and become subject to licensing.[163] A legal liability is how entrepreneurs use or reuse government data under the clear legal regulations governing it.

4. The Role of Public Sectors to Broad Access

In general, there are two major principles that are prerequisites for an open-data policy. First, government data should be openly and freely available online and accessed by a transparent and democratic procedure. Some people are in favor of more availability of government data as a default position, except for specific information related to national security or personal privacy.[164] The transparency in using government data underpins the right to know as a civil right to government. The Obama Administration stated as a goal of its open-data policy increasing transparency, and civil participation to government, which it believed would ultimately advance the quality and efficiency of governmental services.[165] Therefore, OGD has been regarded as a tool to advance public scrutiny, political participation, and the quality of government services in a new era.

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[162] *See in general,* David Robinson*., Government Data and the Invisible Hand,* 11 YALE J.L.& TECH. 160 (2009) (arguing that the private sector, commercial or nonprofit organizations, rather than the government, is better suited to deliver OGD).

[163] J.H. Reichman & Pamela Samuelson, *Intellectual Property Rights in Data?* 50 VAND. L. REV. 51, 114 (1997) (discussing the rationale for sui generis database legislation).

[164] Open Data Charter*, supra* note 131.

[165] WHITE HOUSE OFFICE OF THE PRESS SECRETARY *supra* note 117.

The other method of OGD is about disclosing data as an accessible, readable format. The data should be machine-readable, downloadable, readily useable, and distributable of the source.[166] The Obama Administration endorsed releasing government data in "computer-readable" forms.[167] Most government decision on behalf of open data were based on promoting economic development as a new industry. Therefore, easy access and format are essential for meeting this goal. Obama, in signing an executive order to promote OGD, stated:

> Open data can fuel more private sector innovation … And talented entrepreneurs are doing some amazing things with it … Starting today, we are making even more government data available online, which will help launch even more new startups. And we are making it easier for people to find the data and use it, so that entrepreneurs can build products and services we haven't even imagined yet.[168]

Most people agree that big data has enormous potential for benefits in the social, economic, and political/democratic areas. This indicates that the case when governments try to open their data as part of an that fosters innovation and economic growth.

a. Technical Efforts: Data Ecosystem

OGD is expected to reduce the information gap and increase the efficiency of the use of social resources. To achieve the goal, we must establish a data ecosystem that ensures transparency, open

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[166] TECHNOLOGY, OBAMA WHITE HOUSE ARCHIVE, *available at* obamawhitehouse.archives.gov/issues/technology (last visited Mar. 2, 2018).

[167] *Id.*

[168] WHITE HOUSE OFFICE OF THE PRESS SECRETARY *supra* note 117.

participation, and non-discriminatory participation in society. Building a healthy ecosystem is a prerequisite for access to the full range of data formats. This is essential because new combinations of data can create new knowledge and insights, which can lead to whole new fields of applications.[169]

Public data needs to be presented in a standardized, machine-readable format. For example, PDF files are not machine-readable because the format is hard to applicable on PCs making databases or spread-sheet software. Instead of the undigitized format, the OECD recommends for XML or XSLT formats, which are machine-readable. The machine-readable platforms can disseminate more data among the public because there is no need for specific software to interpret the information. Although no existing legislation grants the right to access information in open formats, most OGD initiatives are now accompanied by policy documents that stipulate that official information must be available in an open, machine-readable format.

Good links between governmental and other sophisticated users requires the creation of structured relationships between government databases, which is made possible by semantic web technologies that convert large quantities of data to linked data formats. Public data is also available through bulk downloads, which enable access to more than not just to one or two areas of government data. A pure dataset can use these to develop applications that make the most of publicly generated data.

The ecosystem must be considered in the context of data provision and use. Data industries contain many stake-holders and their view of data varies in accordance with their situation. They

[169] *See* OECD, *supra* note 40.

play role in making value out of raw data but also use the data engage based on data to enjoy the benefits. Therefore, governments need to communicate with the public to find the most effective ways of meeting both public and private goals.

Disclosure policies cannot guarantee full data transparency. For example, the protection of national secrets or private information, might result in lack of clarity over who owns governmental data.[170] Many laws presume that all public information, except for confidential one, should be accessible, on the assumption that the general public as the legitimate owner of that information. However, experts in data ownership still debate the role of copyrights or other legal protections like *sui generis*, licensing agreements, and trade secrecy. Even when intellectual property rights are not stipulated, public bodies tend to assume that these rights grant exclusive ownership to valuable information, and that is why their economic model sometimes includes selling the information for profit.[171]

b. Legal Challenges

Having a consistent legal framework in place is critical to facilitating access to government data and its re-use, and to improving the use of secure data that is shared between governmental authorities and the wider community.[172] Many legal options have been considered, including licensing, sui generis, and trade-secret regulations under OGD. Well-developed governmental guidelines help maintain informational openness in various fields.

The scope of the right to access information is crucial. But although accessing public data is a

[170] OECD, *supra note* 40 at 30,

[171] *Id* at 38.

[172] *Id* at 37.

fundamental right of citizens, many countries have not yet determined the parameters of their data openness. Yet clear parameters are an essential element of maintaining a society that uses common assets for public data. For example, the Norwegian government has expressed a desire to maintain open access to public data.[173] The parameters provide for exceptions when access to the data which would infringe on other fundamental rights. Data collection and re-use and collection might be allowed or prohibited.

Using public information falls under legal exceptions on grounds such as national security or the protection of privacy, and is therefore not released to the public interest, even when someone files a freedom of information request. There are concerns that public information could be commercialized by being sold to for-profit companies, which produce value-added-products.[174]

Legal policies also takes into account the complexities of the various national legal frameworks for copyright and related IP rights. Among legal issues that arise concerning data are when the ownership of a database is questioned. Public data possession is complicated in trying to strike a balance between promoting innovation, which guarantees developers' ownership of their intellectual properties, and protecting the public domain for sustainable development, so as to allow for further innovation without the tragedy of the anti-commons. These complicated legal issues, which have not been brought in line with the requirements of increased transparency and openness, can hinder the full-fledged development of OGD initiatives and the enforcement of supporting legislation.

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[173] OECD, DIGITAL GOVERNMENT REVIEW OF NORWAY: BOOSTING THE DIGITAL TRANSFORMATION OF THE PUBLIC SECTOR, OECD DIGITAL GOVERNMENT STUDIES (2017).

[174] OECD, *supra* note 40 at 37

D. Summary

Databases are a fundamental component of the big data industry. It is essential to secure valuable quality and quantity of data generated by big data.[175] By analyzing data, databases allow innovators to find patterns and make predictions extremely quickly and efficiently.

No one opposes protecting databases as copyrights when the database proves original by collecting or arranging information.[176] However, there is a question whether a database should be left without legal protections when it is not original. Disney World, for example, provides customers with wrist bands called "Magic Bands," which are equipped with RFID chips to track their behaviors. Visitors do every activity in the theme park with the equivalent of an identification card, including entering an attraction; buying meals; and taking photos. Disney exploits the visitors' data to figure out meaningful patterns about customers' moving or consumption in the park. While each personal datum has no strong signification, 150 million annual visitors produce strong guidelines for future investment for management.[177]Similarly, many other companies are eager to collect as much as data from their customers as possible and view it as an important asset.

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[175] Rubinfelda & Gal *supra* note 8 (explaining "four Vs" to explain feature of Big Data: Volume of data that can be collected and analyzed; Velocity sometimes referred to as the "freshness" of the data; Variety is characterized by the number of different sources from which the data are gathered; and Veracity relates to the truthfulness of the data in essence, its accuracy).

[176] *See.* Feist Publ'n, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 362 (1991) (holding an obvious arrangement ineligible for copyright protection).

[177] Bernard Marr, *Disney Uses Big Data, IoT And Machine Learning to Boost Customer Experience*, FORBES, Aug 24, 2017, *available at* https://www.forbes.com/sites/bernardmarr/2017/08/24/disney-uses-big-data-iot-and-machine-learning-to-boost-customer-experience/#64ca2e233876.

However, the valuable data kept by Disney and other corporations creates new entry barriers.[178] Google and Apple the biggest service providers, collect a great deal of data on things like location and health status via smartphone use, but don't share this data with others. As described above, opening data or algorithm would contribute to the public good. In contrast, possession of data safeguarded by privacy or trade secret protection can hinder public development. To date, the U.S. government has spent $8.7 billion dollars to set up the big data industry and the cost no doubt will steadily increase.[179]

[178] Rubinfeld & Gal,„*supra* note 8 at 351.

[179] Government Spending Will Rise for Both Big Data and Mobile Solutions, https://idc-community.com/government/smart_government/government_spending_will_rise_for_both_big_data_and_mobile_solutions (last visited Apr.2 2018).

III. Related Approaches in OGD

This chapter has explored related legal regulations concerning database and OGD. Many governments and private-sector entities want open data to enhance transparency and accountability to the rest of society. Law is one of the reference points to observe the purpose of the political sectors towards data policy. In general, IP law grants limited exclusiveness as a compensation for promoting individuals' creative activity and to advance productive economic competition.. The protected areas contain strong points and weaknesses in the handling governmental data; however, each law has a precedent from early 20th century to now. Typically, copyright law the highest priority, as it protects data sets when the database conceives creativity.[180]

[180] William M. Landes and Richard A. Posner, *An Economic Analysis of Copyright Law*, Journal of Legal Studies 18, 325, 327(1989) (Copyright protection seeks to promote the public benefit of advancing knowledge and learning by means of an incentive system. And these limits come from both the limits in the copyright clause, which sets its purposes out quite clearly, and the First Amendment; for example, Feist v. Rural *supra* note 176 at 346 (1991).).

The EU adopted a new kind of data protections called "*sui generis.*" to protect databases which are not fulfill a lack of originality set of data but invested sustainable efforts.[181] Licensing laws and regulations are one of the alternative suggestion in the legal approach of the data industry.[182] Trade secrecy protects any valuable information, even non-creative data, preventing its use without permission.[183] Rather than making definite conclusions concerning databases as a subject of law, this chapter enumerates related laws affecting data and OGD to reach further implication.

A. Theoretical Analysis in OGD

1. Transparency and Accountability of OGD

It seems useful to consider issues related to the legal approaches about databases, particularly how the government wishes to operate OGD in the interest of transparency and accountability. The comparison aims to measure which legal approach is adequate in terms of how easy or hard it is for new users to make innovative uses of government data and what benefits are accrued from data disclosure. Since the legal methods applied to databases are different, data policy will depend on what kind of law applies.

The staunch supporters of OGD expect that the openness of public data would promote

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[181] Reichman & Samuelson, *supra* note 163 at 64-76; *see also* Michael Mattioli, *Data Policy in the United States* in Intellectual Property Journal (IPJ) / Zeitschrift für Geistiges Eigentum (ZGE), 299, 303 (published by Mohr Siebeck in Germany 2018) (sui generis as intellectual property protection designed to protect the economic investment).

[182] *See* Jonathan M. Barnett, *Why Is Everyone Afraid of IP Licensing?,* 30 Harvard Journal of Law & Technology, Special Symposium: Private Law and Intellectual Property 123 (2016-2017); *See also* Nicholas Taylor, *Open Source Dual Licensing as a Business Model: How a Flexible IP Strategy Helped Create the World's Most Popular Open Source Database Company*, 37 AIPLA Q. J. 321 (2009).

[183] *See* Lemley, *supra* note 62 (analyzing the two critical features trade secrets share with other IP rights-they promote inventive activity and they promote disclosure of those inventions.)

transparency and accountability of government. If OGD guarantees easier access to existing public information, it would raise public trust in the relevant government bureaus.

In the Open Government Declaration in 2011, the G8 countries announced new technologies aimed to achieve greater political accountability as one of the primary goals of data-sharing on the government side.[184] OGD has a close connection with Information and Communications Technologies (ICTs) and new data processing technologies for the sake of political accountability. For instance, providing public-sector data in a machine-readable format is the primary service delivery that ensures individuals' access rights.[185]

The legal requirements surrounding open data are not different from the gravity of transparency and accountability in other public services. The Digital Accountability and Transparency Act of 2014 ("Data Act") was enacted to further easily accessible and transparent federal information.[186] The act established common standards for all government agencies and presented information on a uniform format for website.[187] It is an extension of the FOIA bill, which proclaimed that "the people's right to know is cherished and guarded."[188]

These acts were useful in providing qualitative information for reuse in the public sector. To fulfill the demands for openness of information, the legal system will meet social accountability

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[184] See *Open Government Declaration*, OPEN GOV'T PARTNERSHIP (Sept. 2011), *available at* http://www.opengovpartnership.org/sites/www.opengovpartnership.org/files/page_files/OGP_Declaration.pdf (beginning "people all around the world are demanding more openness in government.").

[185] OECD *supra* note 40 at 13.

[186] Digital Accountability and Transparency Act of 2014 (DATA Act) Pub. L. No. 113-101 (2014).

[187] *Id*.

[188] An act to amend section 552 of title 5, Freedom of Information Act Pub. L. No. 93-502 (1974).

combines designing improvement of transparency and access to public information.

The demands for transparency and accountability do not differ from those of the legal system as a method for open-data from public sectors to activate successful OGD. Transparency is describable as openness for easy access and use of information for whom wants reliable data process.[189] Accountability means there are adequate for the data to be corrected, so that it is truthful. In other words, it can be the sources of data must respond to questions or concerns about it. When lack of accountability is coupled with the possibility of sanctions for lack of data archiving, the government data would lose credibility or responsibility at public data service.[190]

Transparency and accountability are required standards for administrative action in the private sector. This implies a high degree of openness to the data pool for newcomers, as opposed to the problem of the anti-commons. Therefore, understanding different legal protection for data will help policymakers to select appropriate legal protection for OGD.

2. Design Principles for Sustainable Community

Conceiving of data as commons has been criticized for the difficulty of maintaining cooperation to achieve collective benefits. The Prisoner's Dilemma or the tragedy of the common explains that individuals chose a self-interested option even although it often results in the worst results.[191]

Despite the toughness from selfish might ruin public interest, several precedents overcome dilemmas around the accessibility of data and develop a proper system for using common

[189] *See* OECD *supra* note 40 at13.

[190] *Id* at 14.

[191] OSTROM, *supra* note 10 at 3-5.

resources. The major parties of a successful institutional strategy collaborate with private parties and public organizations.[192] These examples imply that government is not the only solution for conflict or of valuable resources but rather is one member of the discussion.

Individuals do not choose jointly beneficial strategies when resource loses their value rapidly and little mutual trust between the members for sufficient trust.[193] As a result, the community is unable to establish binding rules and a credible surveillance framework concerning resource use voluntarily.[194] The difficulties in the intellectual property stem from abusing the law results from excessive competition or inadequate communication in the market. In the Westlaw case, digitalized legal data blocked access to the public, especially those who are vulnerable to lack of adequate access to digital technology or to not being able to subscribe to the service.

Ostrom's general conditions for managing common resources below[195]:

- define a set of appropriators who are authorized to use a resource (design principle 1),
- relate to the specific attributes of the resource and the community of appropriators using the resource (design principle 2),
- design, at least in part, by local appropriators (design principle 3),
- monitored by individuals accountable to local appropriators (design principle 4), and
- sanctioned using graduated punishments (design principle 5).

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[192] *Id* at 69 (suggesting the efficiency of self-governed rule between the direct stakeholders).

[193] *Id* at 70.

[194] *Id*.

[195] *Id* at 72

In short, the design principles try to build trust that resources will be sustainable when members follow the rule through voluntary restraint. Clear boundaries are necessary as a first step in allowing access to resources. The process protects the resources from freeriding in group or outsiders of community and so prevents the destruction of the resources by overuse. Also, communities who want to use need to understand the specification of resources.

Governments, enterprises, and citizens are the main parties of OGD; however, it is difficult hard to guarantee that they will pursue the same purposes or even similar purposes given in the characteristics of the database. Understanding the various aspects in the resources will help administrators manage the resources to meet different needs.

Users would build sustainable system by accepting some of the demands of community members. The experience of mutual agreement strengthens system durability.. The system monitor needs to be selected among the users or be accountable to them. Finally, the disciplining must be conducted under an autonomous rule rather than by an external authority. Many successful common resource communities regard punishment as a signal they must conform to governmental wishes rather reacting to the penalty itself.

These rules assume that stakeholders believe when the applying resource group is trustworthy. Therefore, they can join the pool, trusting that other members are in transparent system using the database and have the same commitment to transparency. Also, by joining a membership, one is expected to enjoy more significant profit than via existing short-term strategies. Consequently , we can assume that the successful instances to solve common resources depends on the direct participation of the issues. In sum, we can connect the design principles for manner to build a transparent and accountable community below.

	Design Principles
Transparency	Define a set of clear boundaries (D1)
	Specific attributes of the resource (D2)
Accountability	Design by directly related party (D3)
	Monitoring by accountable party (D4)
	Graduated penalties (D5)

Figure 4. Design Principles

B. Legal Approaches

1. Copyrights

The U.S. Copyright Act theoretically protects databases for the compilation of raw materials reflects the authors' selection of work. However, the 1993 Supreme Court case *Feist Publications, Inc., v. Rural Telephone Service Co* ruled against significant clarified on such production.[196] The Court first denied to reward the efforts of individuals to collect information through the so-called "sweat of the brow." Instead, the Court encouraged creative expression, which only needs to possess a "spark" or "minimal degree" of creativity to be protected by copyright.[197]

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[196] John F. Hayden, *Copyright Protection of Computer Databases After Feist*, 5 Harvard Journal of Law & Technology 215, 218(1991); Stacey H. King, *Are We Ready to Answer the Question: Baker v. Selden, The post-Feist Era, and Database Protections*, 41 IDEA 65 (2001) (arguing for originality in copyright after the *Feist* case.).

[197] *See* Feist v. Rural *supra note* 176.

The Court then ruled that a work must contain a certain degree of creativity to be protected as copyrightable rather than enumerate factual information.[198] As a result, *Feist* makes it difficult to predict whether a database is protected under the copyright law.[199] After the Court's decision, Congress attempted to protect uncopyrightable material that contained valuable factual information.[200] Even though a fact itself is uncopyrightable, some databases that are particularly original might reflect a huge investment of capital, time or effort to make a useful database from raw data. It is also necessary to protect data resources without permission or not to allow freeriding.

A typical try to protect the kind of database is so-called "*Sui generis*" in an EU directive that gives an exclusive right to whoever provided reasonable effort and capital to organize a database.[201] In the U.S., on the other hand, the law does not provide exclusive control to database owners; instead, it gives claim to damage for database infringements.[202] In this regard, American

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[198] *Id* at 346; *See also* Philip H. Miller, *Life After Feist: Facts, the First Amendment, and the Copyright Status of Automated Databases,* Fordham L. Rev. 60 (3) 507, 515 (1991).

[199] *See* Miriam Bitton, *Protection for Informational Works after Feist Publications, Inc. v. Rural Telephone Service Co.,* 21 Fordham Intellectual Property, Media and Entertainment Law Journal 611 (2011) (after Feist, some courts approach the question of original arrangement and selection of a database with caution, … copyright protection will be denied.).

[200] The Database Investment and Intellectual Property Antipiracy Act of 1996, H.R. 3531, 104th Cong. (2d Sess. 1996) (Moorhead R-Cal) (database is subject to the Act if it is the result of a qualitatively or quantitatively substantial investment of human, technical, financial or other resources in the collection, assembly, verification, organization or presentation of the database contents.).

[201] *See* Directive 96/9/EC of the European Parliament of the Council of 11 March 1996 on the Legal Protection of Databases, *supra* note 6 at Chpter3.

[202] *See* Collections of Information Antipiracy Act, H.R. 354, 106th Cong. (1999); Collections of Information Antipiracy Act, H.R. 2652, 105th Cong. (1988); Database Investment and Intellectual Property Antipiracy Act of 1996, H.R. 3531, 104th Cong. (1996).

database protection seems to close to unfair competition aspect that differs from the European exclusive IP protection.

2. Sui Generis

Beginning in 1992, EU announced guidelines for protecting cumulative materials that had not met its criteria for originality, so as to gain a copyright, via "*Sui Generis* Right" Regulations. This implied that the copyright system does not cover the whole area of database protection.[203] The Directive 96/9 EC of the European Parliament defined *sui generis* separately from the copyright protection in chapter 3 of the directive.[204]

Comparing to the typical copyright, the directive described database that have been resulted from a substantial qualitative or quantitative investment.[205] In other words, a set of databases that has been compiled with effort but is not original is protected by the *sui generis* regulations, and it provided suitable protection against unfair competition acts.[206] In summary, database holders who invested substantial amounts can protect their intellectual property rights against unpermitted extraction or re-utilization of data. In other word, *sui generis* is legally located between copyright laws and unfair competition acts that provide low-level protection of copyrights and injunctions against unfair competition.[207]

The EC Directive protects databases by using by *sui generis* regulations to keep others from

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[203] Amended Commission Proposal for a Council Directive in the Legal Protection of Databases, *supra* note 6 at 1; *see also* 17 U.S.C. § 103(a) (1994) (providing copyright protection for compilations).

[204] EC Directive *supra note* 6.

[205] *Id*.

[206] Reichman & Samuelson *supra note* 163 at 61.

[207] *Id.* at 64.

extracting or re-utilizing data. "extraction" and "re-utilization," as detailed in EC Directive in Article 7, Section 2, Clause (a) & (b).[208] On the other hand, public data lending is not contained in extraction or re-utilization. In EC Directive Article 7, Section 5 exceptionally regulate these public lending.[209] First, when it accessed repeatedly and systematically; second, when it conflicts with a normal exploration or harms or unreasonably prejudice the legitimate interest of the database maker.[210] The EC Directive demands that criteria that belong to the database be followed[211] Therefore, a secure database must be based on the systematic collection of data and arrange it in qualified ways. Additionally, the copyrightable database is protected by copyright law, and other databases can be protected by proving substantial investment in them.[212]

In the protection of *sui generis*, defining "reasonable investment" usually depends on the court's decision considering the kind of database involved and the amount of capital that has been

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[208] EC Directive *supra note* 6. (according to EC Directive, (a) 'extraction' shall mean the permanent or temporary transfer of all or a substantial part of the contents of a database to another medium by any means or in any form; (b) 're-utilization' shall mean any form of making available to the public all or a substantial part of the contents of a database by the distribution of copies, by renting, by on-line or other forms of transmission. The first sale of a copy of a database within the Community by the right holder or with his consent shall exhaust the right to control resale of that copy within the Community).

[209] *Id.* (The repeated and systematic extraction and/or re-utilization of insubstantial parts of the contents of the database implying acts which conflict with a normal exploitation of that database or which unreasonably prejudice the legitimate interests of the maker of the database shall not be permitted.).

[210] *Id.*

[211] *Id.*

[212] P. Bernt Hugenholtz*, Copyright in Europe: Twenty Years Ago, Today and What the Future Holds*, 23 Fordham Intell. Prop. Media & Ent. L.J. 503, 517 (2013) (Sui generis contributed to "the harmonization process has led to fairly uniform legal rules throughout the EU, and thereby enhanced legal certainty, transparency and the predictability of norms.").

committed to it varies for each case.[213] In the EC Directive, "substantial investigation" is not defined clearly, however it means providing material or human resources for the building of the database or other aids about renewing, verification or supplement.[214] These factors reflect how much databases effect on our society; how difficult it is to collect material for and organize the database, and what is qualitatively or quantitively the database's value.[215] The investor needs to know that these are the criteria that will be used to evaluate a database because he/she has the burden of proof about the database related to members of EU states and courts.

Since different view of database and industrial circumstance of each country, the degree of substantiality of the investment is variable. However, the courts have tried to determine the correct level of substantiality. In *Tele-Info CD* case, the German Federal Supreme Court established substantial investment of Deutsche Telekom's telephone guide published on a CD-ROM.[216] The court admitted the investment of Deutsche Telekom in *sui generis* and the court refused copyright of the list. In UK also recognized the *sui generis* right as a value asset against illegal copy.

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[213] *See* P. Bernt Hugenholtz, *The New Database Right: Early Case Law from Europe*, 7 Int'l Intell. Prop. L. & Pol'y 70-1 (2002) (The Berlin Court ruled that the conversion into digital form and the selecting, updating and verifying of the ads constituted a substantial investment under §87a (I) (1) of the German Copyright Act; Also German Supreme Court protected databases because of the substantial investment involved in their production in *Tele-Info-CD* - Tele-Info-CD, Bundesgerichtshof (Federal Supreme Court) 6 May 1999, [1999] Multimedia und Recht 470).

[214] EC directive *supra* note 6, art. 7 & 10.

[215] Pamela Samuelson, *Mapping the Digital Public Domain: Threats and Opportunities*, 66 Law & Contemp. Probs. 147,159 (2003). *see also* EC directive *supra* note 6 art. 10.

[216] EUROPEAN COMMISSION, STUDY IN SUPPORT OF THE EVALUATION OF DIRECTIVE 96/9/EC ON THE LEGAL PROTECTION OF DATABASES (Publications Office of the European Union, 2018) (in the Tele-Info-CD case BGH, I ZR 199/96 the decision of the German Federal Supreme Court (Bundesgerichtshof) applied different approaches between copyright and unfair competition) (*available at* https://op.europa.eu/en/publication-detail/-/publication/2d1f5a77-5982-11e8-ab41-01aa75ed71a1).

According to *British Horseracing Board v. William Hill*, UK court considered collection of data about horse-races as a database written by BHB resulting of £4 million cost and eighty employees per annum. The court announced that the *sui generis* right protects the database right substantial investment in qualitative terms, more than just repeat or systematic taking.[217]

Therefore, the substantiality of investment in a database is a critical legal issue in the EC Directive. While specific criteria are not fixed yet, however, the EC Directive requires qualitatively and/or quantitatively a substantial investment.[218] Among these requirements, quantitative investment as interpreted in monetary terms and contents.[219]

Quantitative evaluation seems a convenient method to measure data; however, it has a limit in its ability to represent data's core value. The value of a database will be decided as much by its quality. Under these criteria, courts will examine substantial financial value in market for database owners.. Substantiality needs to establish a stable balance between the actual amount and subjective value in the database is the ideal. Consequently, databases that lack originality will be more protected clearly under the *sui generis* regime.

3. Licensing Contract

Database manufacturer, eventually, will earn profits from providing data services rather than raw data. Consumers will look to service providers not in terms of the numbers in the database but

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[217] *Id* at 82.

[218] EC directive supra note 6 art. 10.

[219] Hugenholtz, *supra note 212* (English court found that substantial investment in the controlling and up-keeping of its database.) (Citing Horseracing Board Ltd. v. William Hill Organization Ltd., High Ct. of Justice, Ch. Div., 9 February 2001, Case No. HC 2000 1335.).

what useful services it can provide from it. It means that data service companies would not need to possess databases when companies are able to rent qualitative and quantitative data from the original database owner. Like a regular licensing contract, each party is bound by contractual provisions for accessing, copying, extracting, and other types of database use.

Some cases show that consumers might express acceptance using database by their action which includes the consent to all the seller's proposed terms. In *ProCD* v. *Zeindenberg,* the defendant uploaded the plaintiff's compiled database of phone numbers without permission.[220] According to the *Feist*, database that lacks a minimal degree of creativity is uncopyrightable, the plaintiff cannot claim copyright protection. Judge Frank Easterbrook, however, held for the plaintiff, holding that for a vendor, in accordance with UCC §2-204(1) "contract may be made in any manner sufficient to show agreement"[221] and the vendor may achieve acceptance by the consumer's conduct.[222] In this case, plaintiff proposed a contract that a buyer would accept by using the software after reading the license terms inside the box. As a result, the defendant's retention of the software constituted an acceptance in conduct, as authorized by UCC §2-204(1).[223]

Licensing contracts are convenient for making binding agreements with unspecific individuals in a short time click-wrap licensing is widely used in internet service for saving time and money

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[220] *See* ProCD, Inc. v. Zeidenberg 86 F.3d 1447

[221] *Id.*

[222] *Id* at 1454

[223] ProCD, Inc. v. Zeidenberg, 908 F. Supp. 640, 652 (1996) (This section states: "A contract for sale of goods may be made in any manner sufficient to show agreement, including conduct by both parties which recognizes the existence of such a contract." U.C.C. § 2-204(1)) (1995); *see also* Matthew Beasley, *Who Owns Your Skin: Intellectual Property Law and Norms among Tattoo Artists*, 85 S. Cal. L. Rev. 1137, 1145 (2012).

in the contract process. Customers also enjoy services from providers without the need for a personal meeting to becoming a member but still can get member benefits anytime and anywhere. By overcoming the geographical or periodical limits, many global IP enterprises have been able to offer innovative services around the world.

The offeree's acceptance for licensing contract stated in his willingness to agree is an essential issue in licensing consideration. However, it is difficult to ascertain whether the offeree fully understands the terms of the contract as a normal part of understanding of the licensing. For example, , today's internet service licensing cpntracts, service providers sometimes present unreadably long terms of the contract. Current informed consent contract between users and providers bears biased common willingness in making contract and organizing it.[224] It is time to consider many practical ways to contract between data providers and users. Stable relationships that are cemented by contracts might be the only way to further improvement relationship for both parties, while advancing the public good.

It is important to understand data reuse when the private sector accesses government data. Except for copying the initial data other private or public use of the database might be interpreted as data reuse, which is an essential part of the data industry. Thus, the degree of access to government data generally will be wide, except for national security or privacy matters. The precise access parameters must be set so as to engage from diverse industrial participants.

Licensing will result in practical content because it permits firms to customize supply chains so

[224] *See in general* Mark A. Rothstein, Abigail B. Shoben. *An Unbiased Response to the Open Peer Commentaries on "Does Consent Bias Research?"*, The American Journal of Bioethics 13:4, W1-W4. (2013).

as provide commercialization features to the efficient cost provider of each function.[225] Also it is easy to devise diversification strategies for companies that reduce cost for collecting database and new commercial ventures in the IP market.[226] The DOJ also anitipated that such arrangements would provide procompetitive benefits through harmonizing complementary technologies, reducing transaction costs, clearing blocking, and avoiding costly litigation expenses.[227]

Licensing supply-chains shows that the efficient allocation of contents for actual usage leads to efficient costs for multiple entities.[228] IP holders have used licensing transactions to distribute their rights of asset usage in accordance with temporal, geographic, and market conditions. Considering data reusing is a fundamental part of OGD, the supply chain provides for the effective distribution of public data.

The Cornell Law School operates non-proprietary legal databases without charge in the hopes of attracting customers to their sites.[229] Data users have various plan for exploiting public data in their own business, and therefore, the needs for data also vary as much as do data users. It is impossible to predict all demands of public data; however, data will be supplied by a flexible supply system that responds to actual use.[230] For example, Figure 2 shows a supply chain for how

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[225] Barnett *supra note* 182 at 124.

[226] *Id*.

[227] U.S. DEPARTMENT OF JUSTICE & FEDERAL TRADE COMMISSION, ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY, 30 (2017).

[228] Barnett, *supra* note 182, at 139.

[229] Reichman & Samuelson *supra note* 163 at 153, *see* e.g., Legal Information Institute, at http://www.law.cornell.edu

[230] *Id* at 140.

a specific IP asset in the film industry operates for each business sector.[231]

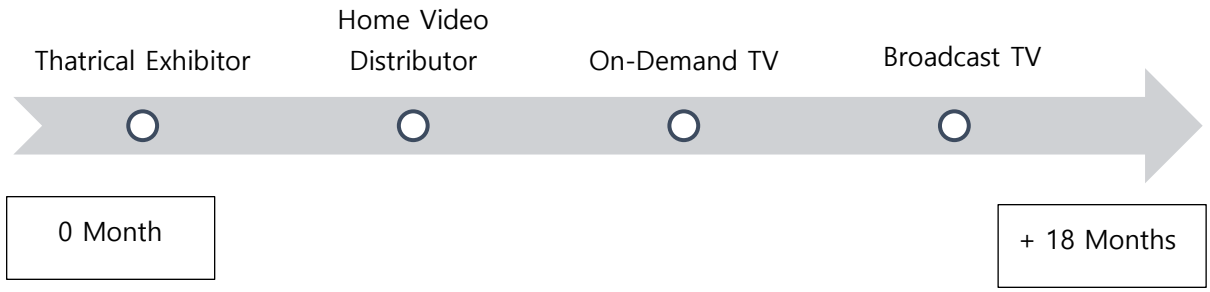

Figure 5. Licensing Supply-Chain relationship in Movie Industry

Managing the best usage of raw data, licensing agreements will be help prevent future legal conflicts for stable usage. A Creative Common License ("CCL") is an open license governance that permits free usage.[232] Compared to other license contract, the CCL regulates usage according to various countries' legal system. The development of CCLs also followed the copyright act as a remedy when user infringements occurred. They offer guideline to users for attribution building a common database, non-commercial usage, no derivative works, and data sharing.[233]

It is difficult to determine whether the database is original in terms of its content and organization of material until the data show on the digital device has been decoded. The *sui generis*

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[231] This timeline is based on Jeffrey C. Ulin, The Business of Media Distribution: Monetizing Film, TV and Video Content in An Online World 30-36 (2009) (Citing at Barnett *supra note* 182 at 140.).

[232] JAMES BOYLE, THE PUBLIC DOMAIN: ENCLOSING THE COMMONS OF THE MIND 182-83 (2008) (Copyright licenses and has been playing an important role in the global movement advocating for information sharing and reuse.); *see also* LAWRENCE LESSIG, CODE: AND OTHER LAWS OF CYBERSPACE, VERSION 2.0 (2nd ed. 2006) (e.g. CC license is an option of making creative works available for reproduction, distribution).

[233] Jyh-Ahn Lee, *Licensing Open Government Data*, 13 Hastings Bus. L.J. 207, 234 (2017).

method, which takes into account, for legal protection, cost and effort to build the database is sometimes considered controversial when considering the fundamental purpose of copyright law. This measure inevitably embraces asking more openness data; however, it cannot provide a clear solution for ambiguous legal issues. Most public databases, especially that generated by the public sector, contain raw data, about which it is difficult to prove originality. This kind of data, however, embrace the massive amount of information that can be reused it for big data.

CCL agreements suggest possibilities based on reliable public data application between data suppliers and users. Even when public data is shared for free, so that such openness is a matter of course for taxpayers, government collect taxes from enterprise income earned by business. When governments open and use public data for private interests, they enhances monetary income and information transparency

New legislative regulations are urgently needed in the dynamic data industry including reasonable economic analysis that seek for sustainable system. The vivid circulation of data must be high on the agenda of public servants, in part as a reward to citizens whose data is collected by their government. The legislature must consider political decisions that satisfactory to both sides not only for the sake of taxpayers but also for that of future IP development.

4. Trespass

Legitimate intellectual property holders can exclude others who would fail appropriate usage requirements, for typical property rights in the Fifth Amendment.[234] Trespass to chattel in torts as

[234] The range of intellectual property rights is broadened from patent to trade secret: *see* James v. Campbell, 104 U.S.

a classic exclusion of property also appliable to protect IP holders blocking unwelcome access by those who might use the database without appropriate payment, resulting in a matter of trespass. *eBay, Inc., v. Bidder's Edge, Inc.,* is a noteworthy example of a cyber-trespass case.[235] The Defendant relayed on-going sales in at various primary auction sites including plaintiff's site. To transmit this information, software "robots" or "web crawlers" were used to collect relevant information or data that scanning through the Internet.[236]

eBay is an internet-based, person-to-person trading site that has over 7 million registered users and over 400,000 new items added to the site every day.[237] Bidder's Edge ("BE") is an internet-based auction aggregation providing a search engine that lists information about a variety of online auction sites, including eBay's..[238] To provide the service, BE ran automated computer programs, the so-called "web crawlers" which continuously access the host web site.[239] BE accessed to the eBay website approximately 100,000 times per day, and it occupied up to 1.53% of the number of requests received by eBay on October and November, 1999.[240]

356,357 (1881) (admitted property rights of patent); see also Ruckelshaus v. Monsanto Co., 467 U.S. 986, 1003-04 (1984) (conferred the purpose of the Fifth Amendment to trade secret that the weakest and least property-like form of intellectual property.).

[235] *See* eBay, Inc., v. Bidder's Edge, Inc., 100 F.Supp.2d 1058 (2000); CRAIG JOYCE, MARSHALL LEAFFER, PETER JASZI, TYLER T. OCHO, & MICHAEL CARROLL, COPYRIGHT LAW 988-89 (LexisNexis, 9th ed. 2013); *see also* Zachary Gold, Mark Latonero, Robots, *Welcome: Ethical and Legal Considerations for Web Crawling and Scraping*, 13 Wash. J. L. Tech. & Arts 275, 286 (2018) (the court… prevent eBay from using a small percent of server resources for other uses).

[236] *Id* COPYRIGHT LAW at 988.

[237] eBay v. Bidder's Edge, *supra note* 235 at 1060.

[238] *Id* at 1062.

[239] *Id.*

[240] *Id* at 1063.

The court noted that the defendant's ongoing web crawling to gather the plaintiff's bidding information would result in a serious decline of processing capabilities or service interruption to the plaintiff's website.[241] In other words, the court acknowledged that defendant's systemic repetitive crawling conform to legal trespass of the plaintiff. The court found that BE, instead of BE relying on copyright to gain injunctive relief, resorted to trespass to chattel.[242] This means that although the defendant did not infringe on the plaintiff's right to possession the use of the web crawlers deprived eBay of the use of its physical assets.[243] The court declared that "the right to exclude others from using physical personal property is not equivalent to any rights protected by copyright and therefore constitutes an extra element that makes trespass qualitatively different from a copyright infringement claim."[244]Consequently, the plaintiff can claim for damage to the actions that negatively affect the quality or value of its system.

Considering the future damages occurred by BE's web-crawling device, it is difficult to decide whether BE harmed eBay's database or its facility. eBay could not prove the actual systemic damages caused by BE's automatic access.[245] Besides, via BE's website, eBay might gain consumers who are looking for the cheapest online market.[246] However, the court acknowledged damages to "at least a portion of the plaintiff's bandwidth and server capacity" and that BE's

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[241] *Id* at 1071, *see also* Register.com, Inc. v. Verio, Inc., 126 F. Supp. 2d. 238, 251 (S.D.N.Y. 2000).

[242] *Id* at 1071.

[243] CRAIG JOYCE; TYLER T OCHOA; MARSHALL A LEAFFER; AND MICHAEL CARROLL, COPYRIGHT LAW 989 (Carolina Academic Press 10th ed.) (2016).

[244] eBay v. Bidder's Edge *supra note* 235 at1072.

[245] *Id* at 1067.

[246] *Id* at 1066.

activities "diminished the quality or value of the plaintiff's computer system."[247] Database is still an undefined area in current intellectual property law and the discussion about the cyber-trespass needs more consideration to protect a new infringement to database based on new technologies.Trespass law in cyberspace protect facilities that engage in digital business, as a chattel and its value. However, the approach must be conducted in the legal context of access to intellectual rather than real property.

5. Trade Secrets

As databases are becoming a precious resources in the modern era, data should be a subject matter of t trade-secret laws and regulations.[248] Trade secret law protects valuable information or knowledge which is not be generally known as a subject matter of the law. When a database is proved a valuable and confidential asset, it should be considered a possible trade secret. There are many disagreements about the origin of trade secret regulations[249] but whatever they are, trade-secret regulations and laws are key ways of protecting information or knowledge in at least two ways.

First, the encourages inventors to develop various areas of IP areas by providing broad protection by safeguarding their right to restrict others from using it. The right to exclude guarantees financial and other rewards for the personal effort that goes into innovation. Compare to typical IP protection of patent or copyright law, trade-secret protects confidential information

[247] *Id* at 1071.

[248] Defend Trade Secrets Act, Pub. L. 114-153, 130 Stat. 376-386 (2016).

[249] Lemley, *supra* note 62 at 319-329 (analyzed source of trade secret as protecting against the theft of proprietary information encourages investment in such information and deterrence of wrongful acts.).

not open to the public. It provides a wide range of protection and less particular condition for protection in IP law.[250]

Second, a trade secret ensures the public receives the benefit of innovations to the same degree that it does from other IP laws. At first glance, trade secrets contribute to an exclusive data market by keeping valuable data as secret. Paradoxically, however, they encourage disclosing and sharing this information, thus contributing to innovation in broad sights.[251]

Most protections in trade secret laws require efforts to protect confidential data or knowledge in a reasonable degree. In other words, inventors can save their cost of overinvestment to keep their secrecy so that they can devote time and effort to their inventions[252] Furthermore, information holders, especially companies, would be encourage to disclose their valuable data for trade reasons. Companies might trade their secret data to collect various data by engaging in exchanging with other companies when the data holders believe the database is fully legally protected.[253]

For these reasons, trade secret have the potential not only to protect broad intellectual property rights but also disclose knowledge for the sake of innovation. However, trade secret seems

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[250] Katherine Linton, *The Importance of Trade Secrets: New Directions in International Trade Policy Making and Empirical Research*, Journal of International Commerce and Economics, 3 (2016).

[251] *See* Lemley, *supra note* 62.

[252] E.I. DuPont de Nemours & Co. v. Christopher, 431 F.2d 1012 (1970), (The Court stated that as long as the plaintiff (Dupont) has taken reasonable measure to keep his information secret not fell below reasonably accepted standard of commercial morality).

[253] *See generally* Arrow's paradox, Stanford Encyclopedia of Philosophy, (Kenneth Arrow's theorem says there are no such procedures whatsoever—none, anyway, that satisfy certain apparently quite reasonable assumptions concerning the autonomy of the people and the rationality of their preferences.) *available at* https://plato.stanford.edu/entries/arrows-theorem/ (last visited Apr. 3 2018).

appropriate for private business rather than for open governmental data. because they are not suitable for protecting common knowledge.[254] Trade secrecy itself conflicts with open data policy because when what has been secret becomes open to the public, it loses legal status as a secret..

6. Hot News Doctrine

As described above in the *Feist* case, data itself is difficult to protect as a human creative activity that is not necessarily subject to copyright.[255] Even OGD usually contains a large number of facts, however, the data is also enormous or too great to be periodically collected by individuals or small businesses. A doctrine of misappropriation in unfair competition law, information has been protected known as the "hot news doctrine" a state statute that protects the ownership of discrete facts for a short period after publication the enormous labor and wealth and its relief.[256] The doctrine and its unique analytical structure may give a hint to how we can rethink methods of current data usage and their protections.

Reichman and Samuelson proposed weak IP rights for data-based information on the misappropriation claim for freeriding.[257] In the view of copyright law, database holders would protect their property rights by assigning similar rights to a copyright. In antitrust law, on the other hands, database holders keep a potential data infringer from accessing their data to protect their property rights.[258]

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[254] JHY-AN LEE, NON-PROFIT ORGANIZATIONS AND THE INTELLECTUAL COMMONS 16 (Edward Elgar Pub) (2013).

[255] *Id*; *See also* The Copyright Act of 1976, 17 U.S.C. 102(b) (2016).

[256] Victoria Smith Ekstrand & Chirstopher Roush, *From Hot News to Hot Data: The Rise of Fintech, the Ownership of Big Data, and the Future of the Hot News Doctrine*, 35 Cardozo Arts & Ent. L.J. 303 (2017).

[257] Reichman & Samuelson *supra note* 163 at 140.

[258] *Id* at 95.

In the view of real property rights for news content, misappropriation is not acceptable, as the Supreme Court ruled in *INS v. AP*. The Supreme Court granted news providers limited rights to factual information as published "hot news."[259] The case reflected the rapid growing competition for news delivered by wire which was important to the development of the news industry.

INS argued that AP news was published as the facts, which were unprotected under copyright, were and so it was free to use they once they were published on the East Coast.[260] According to the defendant's argument in this case, the matter of news is not copyrightable as facts themselves and the right of property would be lost if they were.[261] Therefore, the subsequent use of the news by the public or by the defendant for any purpose whatever should be lawful.[262] Also, any particular interest in the producer of uncopyrighted news would be lost after the first publication.[263]

Unfair competition, however, in business must be determined with particular reference to the business' nature and circumstances of the business. The news must be regarded as quasi-property, considering publishers pain and expense in producing news stories rather than irrespective of the rights of either, as opposed to the public.[264] Until the news came within the general scope and subject matter of copyright law, the "hot news" doctrine has prohibited misappropriate actions.[265]

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[259] *See* International News Service v. Associated Press, *supra* note 52.

[260] *Id* at 240.

[261] *Id.*

[262] *Id* at 233.

[263] *Id* at 234.

[264] *Id* at 242.

[265] Victoria & Roush *supra note* 256 at 311.

The Court ruled that in the context of responding to the needs of both the public and news organization, a "quasi-property" right exists, or what came to be known as the doctrine of misappropriation between rival news organizations.[266] The Court ruled against INS because it had profited without consistent effort of collecting facts in Europe instead of free riding abusing characteristic of the market. Even the Court granted a limited property right in the news, the right is applicable "only to the extent necessary to prevent that competitor from reaping the fruits" of the organization's labor.[267]

The Court's ruling in *INS v. AP* is controversial, as reflected in Justice Brandeis dissent.[268] However, the Court's decision about the news issue occurred as new technology make us consider facing new approach to advanced technologies. The Court's decision based on many actual factors: where profits could be reaped; looked at who earned the profit; what is a profit in the news-gathering process the specific characterizing of news competition.[269] Even this kind of analysis might fail to suggest proactive provisions to the further competition, but the approach based on facts provides more reasonable solution to unfamiliar circumstances.

NBA v. Motorola, Inc., also argued for exclusive rights about real-time information.[270] Motorola, and the Sports Team Analysis and Tracking Systems ("STATS") appeal for a permanent injunction

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[266] International News Service v. Associated Press *supra note* 52 at 240.

[267] Victoria & Roush *supra note* 256 at 310.

[268] International News Service v. Associated Press *supra note* 52 at 262 (Justice Brandeis's dissent "The creation or recognition by courts of a new private right may work serious injury to the general public, unless the boundaries of the right are definitely established and wisely guarded.").

[269] *Id* at 240.

[270] *See* Nat'l Basketball Ass'n v. Motorola, Inc., 105 F.3d 841 (1997).

in their bid to deliver information about matches in National Basketball Association ("NBA"). The court applied a narrow "hot-news" as an exception from preemption of contents of basketball games. The court also holds that appellants' transmission of "real-time" NBA game scores and information make a list of television and radio broadcasts of games in progress did not constitute a misappropriation of "hot news" that allegedly was the property of the NBA.[271] This is because Motorola and STATS did not steal the game information broadcast from the NBA but instead gathered and displayed factual data by using their own resources. In additional, the defendants were not in a competitive relationship and did not deteriorate the inherent quality or characteristic of the original product.[272]

In *Carpenter v. the United States,* the Supreme Court also concluded that information was the employer's property when it was confidential business information.[273] In *Barclays Capital Inc. v. Theflyonthewall.com*, it also held that "hot news" misappropriation information whose generation involved substantial expense in generating research reports and time-sensitive recommendations.[274]

According to the INS case, the hot-news doctrine considered several factors, the first being whether reasonable due process was followed by the original information holder to protect the information and second, whether the parties' relationship constitutes actual competition finally,

[271] *Id* at 843.

[272] *Id* at 855.

[273] *See* Carpenter v. United States, 484 U.S. 19 (1987).

[274] Barclays Capital Inc. v. Theflyonthewall.com, Inc., 650 F.3d 876, 884 (2011) (quoting NBA, 105 F.3d at 845).

whether misappropriating actions lead to profits by free riding.[275]

Eighty years later, in *National Basketball Association v. Motorola, Inc.*, the Court reconsidered misappropriation in more detail, holding that it applies when:

> (1) a plaintiff generates or gathers information at a cost;
>
> (2) the information is time-sensitive;
>
> (3) a defendant's use of the information constitutes free-riding on the plaintiff's efforts;
>
> (4) the defendant is in direct competition with a product or service offered by the plaintiff; and
>
> (5) the ability of other parties to free-ride on the efforts of the plaintiff or others would so reduce the incentive to produce the product or service[s] that its existence or quality would be substantially threatened.[276]

The Second Circuit ruled that Motorola did not engage in misappropriate conduct based on these criteria test, however, the test suggests guideline to decide the facts finding in misappropriation claims.[277] Google and Twitter have also suggested revisions to the preemption section.[278]

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[275] International News Service v. Associated Press *supra* note 52 at 234.

[276] NBA v. Motorola *supra note* 270 at 845; *See also* Database and Collections of Information Misappropriation Act of 2003, H.R. 3261, 108th Cong. (2003) (This bill adopts a pure misappropriation approach, modeled almost literally after the Second Circuit's test).

[277] Barclays Capital Inc. v. Theflyonthewall.com, Inc., *supra* note 274 at 892 (2011).

[278] Brief for Google Inc. & Twitter Inc. as Amici Curiae Supporting Appellants, Barclays Capital Inc. v. The fly on the wall, Inc., 650 F. 3d 876 (2d Cir. 2010) (No. 10-1372); Wendy J. Gordon, *On Owning Information: Intellectual*

As a result, data protection should begin by understanding what kind of data is protectable. Because data is analyzed so many ways -- for example, whether the data is collected with minimum creativity; what is the intent of the database; who collect the data; and whether data openness is appropriate etc. Especially in real-time online, data methodology can immediately help or hurt businesses or the public.

The protection of factual information involves a choice between allowing the reuse of discrete data or facts for innovative new products, thereby reducing transaction costs for new businesses and providing the public domain, and restricting the harm caused by free-riding the use of such data.

Database creators charge that such free-riding is likely to eliminate the market for licensing and creation of using it.[279] The problem of free-riding is an inevitable problem of every part of IP and the more advanced digital technology will blur the boundary between original and copy. The misappropriation cases provide a reasonable lesson for the benefit and protection of the law for factual information. Even if the information is not the subject of copyright, it is necessary to consider for various IP and the court continuously suggested reasons of the matter. The value of

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Property and the Restitutionary Impulse, 78 VA. L. Rev. 149,221-24 (1992) (Wendy Gordon also proposed widening the misappropriation inquiry to include claims when: (1) the costs of developing an information product are high; (2) the costs of copying are low; (3) copying yields a substantially identical product; (4) which a copyist can price cheaply, not having substantial research and development costs to recoup; and (5) when consumers, believing the two products are substantially identical, decide to purchase the cheaper one, thereby inducing market failure because the first comer is unable to recoup its expenses; and when 6) such a market failure could have been averted by a period of protection that would allow the first comer to recoup its expenses and justify its investment in developing the information product).

[279] *See* BOYLE, *supra* note 232 at 217 (2008).

the database is expected to keep increasing, it is must show proactive factors as evidence of market failure, much like cases in commercial speech where such evidence required.[280]

> There are five common factors in each: (1) the nature and purpose of the data, including whether the new data project is transformative; (2) the amount of data taken, including how frequently the data are appropriated; (3) the labor and investment in the data; (4) the market effects of the data appropriation; and (5) the timeliness of the data.[281]

The law will need to time to evaluate the competing interests at stake.

7. Unfair competition in Europe

The EU also has struggled to develop an up-to-date model of database "*sui* generis" and has to decide whether it is dealing with a new development facing the Fourth industrial revolution or the monopolization of international internet service providers. Data pools may exclude other companies by building entry barriers against competitors or newcomers.[282] Exclusion is an

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[280] In commercial speech cases, defendants are required to show that state regulations on advertising meet intermediate scrutiny under the Central Hudson test. The test consists of four prongs: (1) To qualify for First Amendment protection, the commercial speech must concern lawful activity and not be misleading; (2) The government's asserted interest in restricting the speech must be substantial; (3) The restriction must directly advance the government's asserted interest; (4) The restriction must not be more extensive than necessary to serve the asserted government interest ; *see* also Cent. Hudson Gas & Elec. Co. v. Pub. Serv. Comm'n of New York 447 U.S. 557, 566 (1980).

[281] Victoria & Roush *supra note* 256 at 337 (suggesting that "No one factor is determinative. For each factor, we add questions raising the issues of the property and of the unfair competition principles that are at stake. We propose that a hot-data doctrine is part of common law, in the short term at least, while these factors of the test are worked out in the courts").

[282] *See* Rubinfeld & Gal *supra* note 8 (the crisis of entry barrier in database would discourage creative competitions

indispensable concern of pooling because controlling the access to valuable information may cause antitrust actions. A German court prohibited Facebook from abusing its market dominance based on the extent of collecting, using, and merging data from user's account.[283] A concern was that the data pool might stimulate new services and markets by start-ups.

The EC Directive applied *sui generis* protection to a data pool, a combination of databases transferred by the founding parties.[284] However, the large amount of information involved in pooling is difficult to define under the EU competition law. Pools are set up by complex contracts that indicate a clear agreement on the definition of terms and conditions of exchange.[285]

Given the varied information contained in data pools, the parties share relevant strategic and competitive information, which considered at risk of being anticompetitive.[286] If a few companies establish a pool to exclude other from competitors or if they control the market price, the members would be subject to Article 101 of the Treaty on the Functioning of the European Union ("TFEU"). Also, the parties would be suspect to sanctions under Article 102 of TFEU, for abusing the market power when they enjoy the information advantage

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in data industry.)

[283] *See* Bundeskartellamt (the German Competition Authority) prohibits Facebook from combining user data from different sources, (Jul. 02. 2019) *available at* https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2019/07_02_2019_Facebook.html last visited May. 05. 2020).

[284] EC Directive *supra* note 6.

[285] *See e.g.* BJÖRN LUNDQVIST, STANDARDIZATION UNDER EU COMPETITION RULES & US ANTITRUST LAWS: THE RISE AND LIMITS OF SELF-REGULATION (Edward Elgar 2014).

[286] Björn Lundqvist, *Data collaboration Pooling and Hoarding under Competition Law*, Stockholm Faculty of Law Research Paper Series no 61, 11 (2018).

Huawei v. ZTE shows the view of recent European aspects of the abuse of market control exploiting intellectual property rights.[287] The Court of Justice of the European Union ("CJEU") considered that the exercising of a right as a holder is neutral unless the action corresponds to exceptional circumstances for abuse of market dominance under Article 102 of the TFEU.[288] Since Huawei possessed the standard patent announced as a FRAND, ZTE believed it had a legitimate expectation of a licensing contract. Nevertheless, Huawei's demand that ZTE refrain from infringing potential licenses, withdrawing products, or refusing license agreements under FRAND terms, strengthens its market dominance by limiting competition in the market.[289] Therefore, it was considered to constitute the abuse of a market-dominant position under TFEU Article 102.[290]

The Huawei case addressed a liability of sharing an IPR between two parties, The *Asnef-Equifax* case presents an example of how to share beneficial information to potential lenders. Spanish banks and financial associations organized a pool, managed by *Asnef-Equifax,* to exchange credit and lending information about their customers. The pool is able to know how many customers will repay loans but it might be regarded as a cartel discouraging competition between the members.

The CJEU considered whether the pool infringed Article 101(1) of the TFEU by restricting competition in the financial services sector and whether it affected the national competition environment under Article 101(3) TFEU.[291] The court decided the issue on a case-by-case analysis.

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[287] Case C-170/13: Request for a preliminary ruling from the Landgericht Düsseldorf (Germany) lodged on 5 April 2013 — Huawei Technologies Co. Ltd v ZTE Corp., ZTE Deutschland GmbH para.23.

[288] *Id* at para 53.

[289] *Id* at para. 61-62.

[290] *Id*.

[291] Lundqvist, *supra note* 286 at 13.

The court prohibited the data process not to be identified, also financial institutions in the pool should not discriminate either legally or in fact.[292]

In sum, the EU competition law about the data pool would be treated under Articles 101 and 102 of the TFEU. The members of a pool in certain industries or markets would provide open access in order to evade the regulations. Article 101(3) TFEU will be applicable if the data pool rejected the new users to or it had a kind of actual market dominant.[293]

The German Federal Cartel Office (*Bundeskartellamt*) accepts that cooperation between companies in the collection and pooling of data can generate efficiencies and procompetitive effects to connect industries with Internet of Things ("IoT").[294] However, the agreements are offered when they equitably promote technical or economic progress. According to the German court, exchanging information could raise problems in terms of limiting competition side, for instance, collusion, and the raising of entry barriers for third parties.[295] Facilitating collusion or pricing abuses functions as a way to determine the anti-competitive pool, but also the courts need to consider operating on different market levels.

8. The Rule of Reason

The Rule of Reason has suggested an economic analysis of decision-making not only

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[292] *See* Case C-238/05, Asnef-Equifax, Servicios de Información sobre Solvencia y Crédito, SL and Administración del Estado v. Asociación de Usuarios de Servicios Bancarios (Ausbanc) (2006).

[293] Lundqvist, *supra note* 186 at 18.

[294] *See* Bundeskartellamt, Innovations - challenges for competition law practice Series of papers on "Competition and Consumer Protection in the Digital Economy, (2017), *available at* https://www.bundeskartellamt.de/SharedDocs/Publikation/EN/Schriftenreihe_Digitales_II.pdf?__blob=publicationFile&v=3.

[295] *Id*.

determining a rule but also giving reasons for it based on facts. Antitrust law, traditionally had a strict application of *per se* illegal concerning price restriction or non-price restriction.[296] Of course, price is one of the most prominent elements of decision-making in the market, however, it is not the only factor behind decisions to purchase goods or services[297] When customers decide to purchase luxury handbags, for if their consumer choices were based on the price only, famous brands like Gucci and Hermes, would have disappeared a long time ago. Consumers are eager to purchase these handbags at exorbitant prices because of many non-price factors, like reputation, design, fashion, etc. In other words, the traditional per se illegal rule might miss some factors based on the specific reasons deciding price that disturbing the market orders.

The *Sylvania* case shows the influence of economic factors and court's decision in antitrust cases.[298] According to the per se illegal aspect, price restriction by headquarter intervening branch's decision is presumed to occur less competition and decrease of practical choice of consumers.[299] However, in this case, restrictions imposed on dealers by manufacturers promoted inter-brand competition and were therefore not per se illegal.[300] Posner held that adopting the per

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[296] Richard A. Posner, *The Rule of Reason, and the Economic Approach: Reflections on the Sylvania Decision,* 45 University of Chicago Law Review 1, 8 (1977).

[297] *See in general* The Theory of the Leisure Class: An Economic Study of Institutions by Thorstein Veblen, Macmillan, 1899 (It is the most famous explanation why people do unreasonable action deviating the law of demand: Increasing price can, by itself, increase demand and decreasing price can, by itself, decrease demand.); *see also* Harvey Leibenstein, *Bandwagon, Snob, and Veblen Effects in the Theory of Consumers' Demand* Quarterly Journal of Economics, vol. 64, p. 183–207 (1950), *see also* Lester G. Telser, *Why Should Manufacturers Want Fair Trade?* 3 J. Law & Econ. 86 (1960).

[298] Posner *supra note* 296 at 8.

[299] *Id* at 9.

[300] Continental Television v. GTE Sylvania, 433 U.S. 36, 42 (1977).

se rule to in the case was inappropriate since the price restriction contributed to maintaining product quality of and facilitated services between branches.[301] Because of the unpredictable market variables, the court also considered reasonable causes that affect the market.[302]

The MPEG-2 patent pool is recognized as a successful example of technology-sharing in industry. MPEG-2 technology is a technological standard of video transaction format in optical and communication devices like television. The format is used to translate video or audio data to digital devices that users enjoy digital contents. The patent pool was comprised of nine companies that shared twenty-seven patents under a licensing contract.[303] The companies established a separate corporate entity called "MPEG LA" working for licensing allocation and distributing the usage fee as the licensing contract.

After *BMI v. CBS*, the Supreme court considered the purpose of a patent pool and a possible pricing arrangement than the use of price regulation itself.[304] In the case, CBS opted out of the licensing contract without actual count of playing of the BMI's music list conform to the *per se* unlawful under the antitrust laws.[305] CBS argued that the price-fixing stipulated by the contract correspond to unlawful tying, copyright misuse, a concerted refusal to deal, and monopolization.[306]

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[301] Posner *supra note* 296 at 12 (Franchise tie-ins are methods not of discriminating or otherwise exploiting or extending monopoly power but of promoting inter brand competition by assuring quality control and product and service uniformity.).

[302] *See* United States v. Columbia Steel Co., 334 U.S. 495, 527-28 (1948).

[303] DOJ, MPEG LA BUSINESS REVIEW LETTER (1997) (last visited Apr. 16th 2020) *available at* https://www.justice.gov/atr/response-trustees-columbia-university-fujitsu-limited-general-instrument-corp-lucent.

[304] Broadcast Music, Inc. v. Columbia Broadcasting System, 441 U.S. 1 (1979).

[305] *Id* at 4.

[306] CBS v. ASCAP, 562 F.2d 130, 136 (2d Cir. 1977).

Unlike the Second Circuit court, the Supreme Court held that the illegality of the tying arrangement should be considered under the rule of reason rather than the per se rule.[307] In considering market conditions, the blanket licensing provision is a necessary consequence of a substantial lowering of costs, which is of course potentially benefits both sellers and buyers.[308] Therefore, the licensing practice is not restraint of trade whose purpose is the stifling of competition which is illegal under the Sherman Antitrust Act.[309]

The U.S. Depart of Justice analyzed the MPEG-2 licensing contract and decided that the patent pool contains benefits in terms of promoting competition and reducing transaction costs.[310] The review acknowledged the portfolio's limits to technically essential part, not competitive with each other nor foreclosing the potential parties.[311]

Neutral parties also participate in licensing to enhance transparency and objectiveness. The licensing of MPEG-2 is likely to provide stable patent and savings cost to licensor and licensee. As a result of the review, the DOJ did not charge the pool with antitrust violations..[312] The MPEG-2 licensing shows that the main issue facing licensing or patent pools occurs as a consequence of the extent to which their governance stimulates procompetitive effects to the market.[313]

The goal of the antitrust actions that support an efficient economic system needs to be annalistic

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[307] Reichman & Samuelson, *supra note* 163 at 24 (the Court dissented automatic declaration of illegal in all of its many manifestations, instead of more discriminating examination under the rule of reason).

[308] *Id* at 21.

[309] *Id* at 9.

[310] DOJ *supra note* 303 at 15.

[311] *Id* at 10.

[312] *Id* at 16.

[313] *See* DEPARTMENT OF JUSTICE & FEDERAL TRADE COMMISSION, *supra* note *227* § 5.5.

methods,[314] Specifically, whether: 1) competition decreased in the market or consumers' actual business choices of related information were limited by market controller's restriction. In other words, the court needs to consider factual evidence of social damages caused by the company's market control. 2) a company intended to control prices or engage in monopolization. If a considerable company with a considerable market share attempts to price control, it might acknowledge its efforts to form a cartel or monopolize the market. On the other hands, if a small company control the price of its branch of the business, it is difficult to understand this as trying to make.

The public interests is also one of the essential factors in the rule of reason. In *INS v. AP*,[315] for example, given that the Supreme Court applied the per se rule that news is a public domain, can we think that of its judgment as right? The court faced a new problem caused by new technologies and business model so, they needed to decide lean on equity. The court, therefore, decided quasi-property for a short time based on misappropriation to prevent free riding. The Court's decision sends a message about the evolving new technology in big data.

C. Summary

A database is subject to various law in accordance with whether its contents are original in terms of data and their organization. Subject to of copyright law material resulting from creative action,

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[314] Posner, *supra note* 296 at 16-17, *See also* Justice Brandeis's opinion in Chicago Bd. of Trade v. United States, 246 U.S. 231, 238 (1918) (To determine that question the court must ordinarily consider the facts peculiar to the business to which the restraint is applied; its condition before and after the restraint was imposed; the nature of the restraint and its effect, actual or probable. This is not because a good intention will save an otherwise objectionable regulation or the reverse; but because knowledge of intent may help the court to interpret facts and to predict consequences.).

[315] INS v. AP *supra note* 52 at 215.

databases appear on digital devices before users decode them. On the other hand, the *sui generis* method to protect the effort and cost invested to construct a database might prove controversial when considering the fundamental purpose of copyright law. This measure inevitably embraces industry demands but cannot provide clear solutions for various current issues at once. Most of the OGD, which is mainly generated by the public sector, contains raw data collected from citizens, about which it is difficult to prove a creative nature. These massive amounts of data can be reused as part of the big-data industry.

Licensing will be beneficial to prevent future legal conflicts and to ensure stable usage building, making for sustainable, easy access to and usage of raw data, CCL in particular suggest possibilities based on liable public data approaches to idustrial demands. When public data is shared with people for free, this openness becomes a matter of course for taxpayers; still, government gain taxes from the profits earned by businesses. When government opens and allows reuse public data for private interest, it enhancess financial transparency.

Other legal systems also show the pros and cons of such relationships are the OGD application. Trade-secret regulations are a suitable way to protect databases or share data among different groups. However, doing so might make the group exclusive in its knowledge of this data , or create access barriers to possible new users. The “hot news” doctrine inspires for data owners who want to protect valuable collective data. It might applicable area in database right, but misappropriation is also vague in data area either.

Considering the overall nature of IP law and Ostrom’s design principles in standard resource

management, each IP statute has its strengths and weaknesses when applied to common sources.[316] As I noted into the previous chapter Ostrom suggested clear reasons for managing common resources. These principles can guide the our legal system in formulating OGD and other statutes and regulations

[316] Elinor Ostrom, *Design principles in long-enduring irrigation institutions, Water Resources Research*, Volume 29, Issue 7, pp. 1907-1912 (1993); *See also* Michael Cox, Gwen Arnold, and Sergio Villamayor Tomás, *A Review of Design Principles for Community-based Natural Resource Management Ecology and Society* 15(4): 38 (2010).

IV. Types of Public Domain Usages

A. Introduction

The challenges of distributing public resources revolve mainly around actions among users. Researchers and political leaders considered the sustainable usage of limited resources in common pools. The preferred best practice seems to be governmental regulation of private ownership so as to prevent market failure in IP industries.[317] Governing the commons extended to related private parties; this suggests the advantages of open communities that are able to engage in sustainable development through self-governance.[318]

This chapter analyzes several types of reusing information in the public domain. Because of their complex industrial background, the main actors in this domain are governments, enterprises, and civil organizations. The private sector is an important party to OGD policy as a major user of databases and a stimulator of diversity. They could deprive the public of access to databases when they are focused on profit or the competition. On the other hand, public sectors act also find it difficult to respond to market change via inefficient bureaucratic processes.

The OGD's success is related to its ability induce the private sector to follow the public sector's norms of increased transparency and accountability. There are various examples of the market and regulatory approaches in the utilization of public information.

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[317] Hardin *supra* note 21 at 1244-46.

[318] OSTROM, *supra* note 10 at 18-21 (insighting potent of governance as the third party of ownership).

1. Characteristics of the Private Sector's Information Usage: Legal Case Report as a Public Domain in the U.S.

The U.S. encouraged private sectors entities to reuse public data in their businesses even before the advent of big data. The legal data service firm is a private business that reuses public data, like case reports, which it supplies to law firms or law schools nation-wide. The case reporting service is an essential area in the case law system where each precedent potentially has binding power as law. Therefore, finding authoritative precedents related to a pending case is essential but it can be difficult to find the most suitable case among the a hundred years or more of records.

Fortunately, advanced digital technology reformed the case research environment after the 1970s.[319] Now, lawyers and legal professions can find legal materials easily on their monitors. All legal precedents promulgated as judicial rulings are in the public domain.[320] However, collecting and rearranging a database is copyrightable when the database it is original or creative methodologies have been used to organize it.[321] Individual cases and their precedents are free for use in the public domain, but when it compiles by others' efforts as a work of compilation, they are not.

A creatively compiled database of case reports aids effective legal services for the public good rather than leaving records of precedents to "gather dust" while being difficult to locate..

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[319] LexisNexis the launched first electronic legal data service in 1970s *See* Wikipedia, *available at* https://en.wikipedia.org/wiki/LexisNexis#Acquisitions (last visited Feb. 16 2020).

[320] *See e.g.* Wheaton v. Peters, 33 U.S. 591 (1834).

[321] *See e.g.* Feist. v. Rural *supra* note 176.

Sometimes, publishers of case reports argue that they should have broad copyright rights as a reward for their efforts in creating a database. This conflicts with the idea that it is in the public interest to have legal rulings in the open public domain.

In *Matthew Bender & Company, Inc. v. West Publishing Company*, a Second Circuit court held that the plaintiffs, as producers of CD-ROMs containing Supreme Court and Federal court of appeals decisions, were free to copy such decisions from materials published by the defendant, West Publishing Company ("West").[322]

Since *Wheaton v. Peters* in 1834, the Supreme Court has held that the published opinions of federal courts are not copyrightable.[323] Justice Mclean concluded:: "It may be proper to remark that the court is unanimous of opinion, that no reporter has or can have any copyright in the written opinions delivered by this court; and that the judges thereof cannot confer on any reporter any such right."[324] State courts generally also agreed with Supreme Court decisions that the publication of case reports must primarily consider easy access by citizens rather than the interests of the printing and publishing businesses.[325]

In *Code Revision Commission v. Public Resource.Org, Inc.*, a circuit court also held that the ownership of the law belongs to the people.[326] In American legal history, who can legally publish

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[322] Matthew Bender v. West Publishing Company, 158 F.3d 674 (2d Cir. 1998).

[323] Wheaton v. Peters, 33 U.S. 591 (1834).

[324] *Id* at 668.

[325] *See* Nebraska v. State Journal Co., 110 N.W. 763, 764 (Neb.1906) (The Supreme Court of Nebraska held that "The literary matter involved in these reports became the property of the public before the manuscripts, or any other property of the state, were placed in the hands of the defendant to enable it to carry out the terms of its contract with the state.")

[326] Code Revision Commission v. Public Resource.Org, Inc., 906 F.3d 1229, 1239 (11th Cir. 2018). The "Under democratic rule, the People are sovereign, they govern themselves through their legislative and judicial representatives,

legal decisions has long been an area of dispute.[327] But knowing the law and supporting access to it, on the other hand, must be secured as a fundamental human right of residents of a modern constitutional state.[328] The courts have already proclaimed he right to access to the law as a right of citizenship:

> Every citizen is presumed to know the law thus declared, and it needs no argument to show that justice requires that all should have free access to the opinions and that it is against sound public policy to prevent this, or to suppress and keep from the earliest knowledge of the public the statutes or the decisions and opinions of the justices.[329]

The government publishes and distributes Supreme Court rulings in the U.S. Reports, however lower-level federal court opinions are not required to publish their opinions. Besides, the public legal service does not contain unpublished opinions which are designated as non-precedential compared to private case reports. These unpublished opinions do not necessarily affect decisions based on precedents; however, some are increasingly cited in official contexts.[330]

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and they are ultimately the source of our law. Under this arrangement, lawmakers and judges are draftsmen of the law, exercising delegated authority, and acting as servants of the People, and whatever they produce the People are the true authors."

[327] Wheaton v. Peters, *supra note* 323 at 593 (copyright dispute regarding private publication of U.S. Supreme Court opinions); Banks v. Manchester, 128 U.S. 244, 253 (1888).

[328] *See* Mitee *supra* note 78.

[329] Nash v. Lathrop *supra* note 83.

[330] *See* Erica S. Weisgerber, *Unpublished Opinions: A Convenient Means to an Unconstitutional End*, 97 Geo. L. Rev. 621 (2009) (arguing that "full citation and publication of appellate opinions is necessary to allow the democracy to supervise application of the laws it maintains, correct error, assure equal and uniform application, reconcile inconsistencies, and continually improve the logic, purpose, consistency and justness of our laws, procedures and

LexisNexis and Westlaw provide analyzed opinions only to paid-up subscribers. Lexis, Westlaw, and Bloomberg independently upload unpublished opinions on their websites, which may, or may not be, available through court websites or other free internet sources.

As is generally also assumed by courts around the world, the U.S. legal system holds that ignorance of the law is no excuse for violating it; this is fundamental across the American legal system.[331]. American U.S. courts clearly have declared the no-excuse principle and, to back it, ruled in favor of free access to legal materials.[332] However, the digitalized system might cut off the vulnerable group who are not familiar with and/or able to access digital materials.

For instance, the shrinking supply of legal print collections negatively affects self-represented litigants.[333] Digitalized legal records often are preferred by legal professionals and others who can afford access them by paying the usage cost. However, most self-represented litigants have difficulty not only hiring lawyers' help but also using digital devices to access such materials .[334] The "digital divide" is severe among older, less educated, and less affluent populations.[335] As mentioned the accessibility of legal information is a fundamental human rights, the current digitalized law publication might force desperate availability to someone.

Scholars often criticize the overbroad assertion of copyright in the public domain.[336] It is crucial

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jurists).

[331] *See* Cass *supra* note 82

[332] Nash v. Lathrop *supra* note 83; *see also* Bldg. Officials & Code Adm. v. Code Tech., Inc. *supra note* 80.

[333] *See* K. Mattioli *supra* note 84.

[334] *Id* at 48.

[335] *See* COUNCIL OF ECONOMIC ADVISERS *supra* note 84.

[336] *See* Heald *supra* note 79; *see also* Jason Mazzone, *Copyfraud*, 81 N.Y.U. L. Rev. 1026 (2006), *see also* Mitee, *supra note* 78 at 1468 *see also* Ardia *supra* note 78.

for citizens to have free, open access to the in the interest of due process.[337] When considering the current state of online legal services, the main challenge for American legal institutions will be to build an open model rather than one characterized by technical limitation that limit access. Government is essential in guaranteeing public access to legal records and publications, however, it is difficult for it to provide the public services.[338]

2. Right of Publishers in Case Pagination

a. West Publishing Co. v. Mead Data Central

As explained above, legal records belong in the public domain. Westlaw is well- known as a primary case report publisher; earns billions of dollars in a year for access to its legal database system.[339]

West Publishing Co. v. Mead Data Central Inc. explains how copyright protection applies to the legal research industry.[340] In the case, Westlaw brought a copyright infringement suit based on

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[337] *See* Bldg. Officials & Code Adm. v. Code Tech., Inc., *supra* note 80

[338] *See* IFLA Statement on Government Provision of Public Legal Information in the Digital Age (2016), https://www.ifla.org/publications/node/11064 (recommending all governments provide access to legal information in a digital format for free to the public and that such information be authentic and preserved); *see* Ralph Nader, *The Law Must be Free and Accessible to All. Not Secret and Profitable*, HUFFINGTON POST *available at* https://www.huffingtonpost.com/ralph-nader/the-law-must-be-free-and-accessible_b_4747745.html.

[339] Thomson Reuters, a mother company of West announced its revenue for $2,373 million dollars in legal profession service in 2018 *available at* https://www.thomsonreuters.com/en/press-releases/2019/february/thomson-reuters-reports-fourth-quarter-and-full-year-2018-results.html; *see also* Raju Narisetti and Solange De Santis, *Thomson to Buy West Publishing for $3.43 Billion,* WALL ST. J., February 26, 1996, at A3.

[340] West Publishing Co. v. Mead Data Central Inc.799 F.2d 1219 (8th Cir. 1986).

Mead's use of the star pagination system used in Westlaw's database system.[341]

The Eighth Circuit court held that star pagination and other organization of Westlaw could be protected by compilate copyright, like Shakespeare's sonnets.[342] The court noted an authorship of original work reflecting the arrangement of a copyrightable compilation work.[343] Moreover the effort to organize and arrange published requires labor and individual judgment as criteria to decide copyrightability.[344] As a result, the court concluded that Mead committed a copyright infringement to West's pagination system.

Section 103(a) of the Copyright Act provides that compilations and derivative works are copyrightable.[345] With legal materials in the public domain, an author can assemble preexisting materials into what constitutes an original work that is copyrightable.[346]

According to the U.S. Supreme Court, there are three elements that contribute to compilation copyright: (1) the collection and assembly of preexisting material; (2) the selection, coordination or arrangement of that material; and (3) the creation of an original work by virtue of that selection, coordination or arrangement.[347] Therefore, a publisher can argue that its work should be copyrighted, even when materials used in the compilation are non-copyrightable.

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[341] *Id* at 1221.

[342] *Id* at 1224.

[343] *Id*.

[344] *Id* at 1226.

[345] *See* 17 U.S.C. § 103(a)

[346] *See* 17 U.S.C. § 101

[347] Feist v. Rural, *supra note* 176 at 357.

b. Mathewbanders

The 1976 Copyright Act is a statute that explicitly requires originality as a condition of copyright.[348] The judges in *Feist* concurred that the element of copyright is originality rather than an effort to collect data or materials.[349] The requirement of originality involves only "some minimal level of creativity.[350] While this criterion of originality might not be entirely clear, the Supreme Court's decision threatened West's strong protection of its intellectual property.

As a dominant case report publisher, Westlaw provides a compilation of court decisions with its numbering and headnote system. The system provided by the publisher is efficient for finding similar topics by matching their key numbering indexes.

Mathew Bender ("Bender") is a legal publisher that provides CD-ROM products using the West star-pagination reporter system. HarperLaw, another legal publisher, also collected a significant number of case reports from West by June 1996.[351]

The district court accepted Bender and HarperLaw's argument that the star pagination only conveys a fact appearing on the paper.[352] Therefore, the facts themselves cannot be protected by copyright.[353] Despite West's insistence on distinguishing between preexisting facts and compilations resulting from creative efforts, the court stated that page numbers of court's

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[348] 17 U.S.C. § 102(a)

[349] Feist v. Rural, *supra note* 176 at 358

[350] *Id*.

[351] Matthew Bender v. West *supra note* 322 at 678

[352] Matthew Bender & Co. West Publishing Co., 41 U.S.P.Q.2d 1930, 1931 (S.D.N.Y. 1997).

[353] *Id* at 1932.

decision are also factual information.[354] In this regards, the court ruled that West's considerable efforts to organize cases were not evidence of originality that would be subject to copyright.[355]

The Second Circuit court also didn't accept West's argues in the appeal that West annotated court decision, for example, adding parallel citations to court decisions cited about the opinion, abbreviating of the case, and checking citations for accuracy.[356] The court concluded that the additional action by West didn't fulfill the requirement of substantial expenditures of time and effort to produce original works under Section 102(a) of Copyright Act.

The court cited the interpretation of this in *Feist* case that minor changes of caption, and the identification of judges are insufficient to qualify as "original works of authorship."[357] The judges considered West's elements as trivial and minor changes as contributing to a derivative work that is not copyrightable. Affording these decisions copyright protection could give defendant an effective monopoly over the commercial publication of case reports.[358]

Since the *Wheaton* case, the Court declared that legal decisions cannot be a subject matter of copyright statutes.[359] While there have been many attempts to profit from case reporting, *Feist* limited the protection afforded compilations without originality by denying the value of "sweat

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354 *Id.*

355 *Id* at 1934

356 *Id.*

357 Id at 1932.

358 *Id*.

359 Wheaton v. Peters, *supra note 323* at 668 (It may be proper to remark that the court are unanimously of opinion, that no reporter has or can have any copyright in the written opinions delivered by this court; and that the judges thereof cannot confer on any reporter any such right.).

of the brow" labor alone[360] In this regard, *Bender* serves as a reminder that the law should be in the public domain and that people should enjoy more access to case publications.

News services also experienced disputes about the presentation of factual information.[361] Even as American law eliminated the protection of non-creative compilations in copyright law, the EU established new methods to protect reasonable efforts to build a database.[362] The efforts of governments, however, might not be sufficient to safeguard the actual use of public data.

An IEFA statement in 2016, strongly recommended the complete, free accessibility of legal information to the public in a digital format.[363] The statement also emphasized responsibility for securing for practical qualitative effort of the contents and accessibility of the legal information.[364] The statement again raised the question of what is the proper balance between public interest and private initiative.

B. Open Data Utilization by Government – Clearance but Inefficiency

Governments around the world create and collect enormous amount of data that deal with important environmental, educational, geographical, scientific, demographic, transportation,

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[360] *See* Feist v. Rural *supra* note 176.

[361] *See* International News Service v. Associated Press, *supra* note 52; *see also* NBA v. Motorola *supra note* 270.

[362] Sui generis admits the factual information collection as a neighboring copyright in Europe and S. Korea

[363] *See* IFLA Statement on Government Provision of Public Legal Information in the Digital Age (2016) (*available at* https://www.ifla.org/files/assets/clm/statements/ifla_statement_on_public_legal_information.pdf).

[364] *Id* ("Government providers also need to take responsibility for ensuring that the content they post is available to all, at no fee, that the content is authentic and trustworthy, and that it is preserved for public use over time in cooperation with memory institutions.").

tourism, health insurance, crime, occupational safety, product safety, and many other types of information.[365] Making and managing a database is very expensive work to collect and manage individual raw information as an single organized work. For example, in the 11th century, when Great Britain took a census called "The Domesday Book" so as to provide individuals definitive proof of land ownership and obligations to tax and military service.,[366] it required two years to research and tabulate 268,984 individuals and their properties.[367] Today, such a tabulation would be considerably less costly and time-consuming.[368] In today's digital era, databases contains economic value that needs legal protection.

South Korea ("Korea") built high-speed internet fiber network that covered 80% of the entire country.[369] Based on the quality of this infrastructure, the Korean government launched public data service in 2013. Although the project begun later than other developed countries, the quantity of open data has grown faster because the policy is driven strongly by the central government to enhance the industrial ecosystem and is part of what is seen as a public service. The Korean government seems to believe that data can contribute to national competitiveness, and otherwise is an indispensable resource that will create quality jobs in emerging industries. Consequently,

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365 Hardy & Maurushat *supra* note 116; *see also* OECD, OPEN GOVERNMENT DATA: TOWARDS EMPIRICAL ANALYSIS OF OPEN GOVERNMENT DATA INITIATIVES 4 (Organization for Economic Cooperation and Development, Working Papers on Public Governance No. 22, 2013), *available at* http://www.oecd-ilibrary.org/governance/open-government-data_5k46bj4fO3s7-en.

366 BBC History in depth *available at* http://www.bbc.co.uk/history/british/normans/doomsday_01.shtml (last visited 2018.02.26)

367 *Id.*

368 In France do sample survey every year, U.S., and South Korea do census every five years to count population, http://theme.archives.go.kr/next/populationPolicy/viewPolicy.do (last visited 2018.02.27).

369 OECD, OECD BROADBAND STATISTICS, (2020) *available at* https://www.oecd.org/sti/broadband/broadband-statistics-update.htm (last visited May 19. 2020).

public datasets published have increased 4.6 times, and the number of individuals with access to the Open Data via the web portal (data.go.kr) has increased 440 times in 5 years.[370]

According to the 2013 "Act on the Promotion, Provision and Use of Public Data", the Korean government has defined public data as that created and retained by the national government, municipal organizations, and civic organizations that are available to the people.[371] Also, the law promotes access, re-use and redistribution of the public data by anyone in order to create new value.[372]

As a follow-up to this act, the government established the Open Data Strategy Council and Open Data Mediation Committee in December. 2013, created an Open Data master plan for 2014-2016, which released national data in 11 main key areas. As a result of these efforts, the Korean government ranked number one in the OECD OUR Data Index in 2015.[373] The "e-Government Development Index" released by UN in 2018 also ranked the Korean government as number three in the world regarding its ability and willingness of ICT.[374]

After the first release of public data, the government progressively opened access to valuable

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[370] NATIONAL INFORMATION SOCIETY AGENCY OF SOUTH KOREA (NIA), NATIONAL INFORMATION WHITE PAPER 3 (English translated) (2018) *available at* https://www.nia.or.kr/site/nia_kor/ex/bbs/List.do?cbIdx=44086

[371] Gonggong data jegong mit yiyong hwalsunghwae gwanhan bubryul [Act on Promotion of the Provision and Use of Public Data], Act No.14839, Jul. 26. 2017, art. 2 (S. Kor), translated in Korea Legislation Research Inst., *available at* http://elaw.klri.re.kr/kor_service/lawView.do?hseq=47133&lang=ENG.

[372] *Id* at art. 1.

[373] Rivera Perez, Emilsson & Ubaldi, *OECD OUR data Index - Open, Useful, Re-Usable Government Data 2019, see also* OECD, OECD POLICY PAPERS ON PUBLIC GOVERNANCE NO. 1, (2020), *available at* http://www.oecd.org/governance/digital-government/ourdata-index-policy-paper-2020.pdf.

[374] UN, UNITED NATIONS E-GOVERNMENT SURVEY 2018: E-Government in Support of Sustainable Development (2018), https://www.unescap.org/sites/default/files/E-Government%20Survey%202018_FINAL.pdf.

public data in 22 areas in 2016 and 15 in 2017. Before 2017, the Korean government already had released 48 districts, 387 datasets, and 30 billion Public Sector Information ("PSI") data via the open data process. Also, the Ministry of the Interior and Safety ("MIS"), which is the main repository of open government data, established a data utilization support, center called "Open Square-D," to support new industry and to further data utilization. Finally, the government announced 8,655 new job making; 2.9 trillion KRW for sales increase; 11.2 billion KRW cost savings and 32.7% improved work efficiency thanks to central governmental support.

The public data plan is focused on certain industrial categories. The MIS is facilitating the development of data infrastructure policies, and the government also has enacted the Act on the Promotion of Data-Driven Public Administration to stimulate the sharing and interfacing of data among public organization. MIS expects more interaction with the private sectors in institutional development and scientific administrative system. It plans to open a "Big Data Center on the Public Sector" to encourage big- data centers across the public and private sectors to share data and to build cooperative framework with stakeholders. MIS will continue its comprehensive support for innovative entrepreneurship initiatives.[375] It manages an Open Square-D plan to support start-ups and has promised small companies financial assistance to develop their businesses overseas.

The Korean government considers openness as essential to further the transparency of government and to improve significantly public access to data.[376] It prefers negative listing methods in data access in mid/long term disclosure. The government anticipates playing an essential role in creating greater societal value, fostering new industries, stimulating job

[375] *Id* at 13.

[376] *Id*. 12

opportunities via sharing national core data, and increasing disclosure of such information.[377]

The legal developments, which contribute to more open government in Korea, are focused on building new industry-related IT or otherwise contributing to the fourth industrial revolution.[378] The government also is making an effort to change the country's industrial structure by addressing chronic social problems and otherwise enhancing people's quality of life while strengthening national competitiveness.

As described above Korean government has been active in OGD by developing a government-centered plan; however, some reports say that the government's data policy works need additional measures. According to a report by the Korean National Information Agency ("NIA") in 2018, small and medium-sized companies adopt big data analysis at a 26.8% lesser rate fewer than do big companies.[379] Worse, the gap is increasing because of the speed of IT usage in large corporations has increased in the area of intra-functional and inter-functional, business-to-business usage areas compared to SMEs.[380] They have difficulties in Big Data usage because of the (1) lack of applicable data available to them; (2) absence of a specialized workforce, and (3) shortage of capital to deal with Big Data.[381]

Many SMEs eventually have recognized that data analyses are needed for their afterward, but often they cannot obtain useful data without accepting new technology. The survey also shows a

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[377] *Id*.

[378] *Id* at 42

[379] *Id* at 40 (The survey distinguished SMEs based on annual sales figure under 100million dollars)

[380] *Id*.

[381] *Id* at 11.

rapid change in the view of big data. Compare to same study conducted in 2017, only 31.8% of the companies that responded had plans to utilize big data in their decision-making process, however, in 2019, the figure was 76.8%.[382] The survey shows that not only rapid changes in industry, but also the gap of information between large and small sized companies had increased. Also, most SMEs cannot enjoy the benefits of OGD, in facts.

The report suggested two measures the government should take to invigorate the industry. First, government need to share data processing methodologies of public data rather than just open the results of the dataset. The data modeling or processing algorithm are inaccessible areas rather than OGD. For companies to know data-processing methods might provide fundamental solutions rather than providing results. Second, government supports more public works related to the Big Data industry. This is based on the premise that this industry still needs more quantitative growth and that public assistance might help it. Including Korean government, the OGD must consider the demands of the market and private sectors to achieve significant, sustainable development.

C. IPR Promotes the Traditional Industry of SMEs

1. Analyzing Norway's Intellectual Property Rights

A close look at the private and public sectors show that one-sided data usage is inefficient. In the private, sectors there could be limited or lack data access for some parties who cannot afford to pay the service fee. On the other hand, governments have trouble fulfilling the actual demands of the market.

This section explores how Intellectual Property Rights (IPR) works in a traditional Norwegian

[382] *Id* at 12.

industry. The Norwegian government reports significant success in reaping the benefits of IPR, which is essentially in older industries than, for example, ones like like autonomous vehicles or artificial intelligence.

Fishing, a typical old-fashioned industrial sector, is one example of the use of the latest technology. The Norwegian government has constructed a developed system of IPR,[383] and the country also follows most European IP protection systems, including the General Data Protection Regulation (GDPR) adopted by the European Economic Area (EEA) treaty (even though Norway is not a member of the EU). The Norwegian government tries to maintain its leading position of the industry by applying new technologies and by furthering cooperation between the private and education sectors, which reflects the broad potential utility of IP.

2. SMEs in Norway

97% of all firms in Norway are SMEs.[384] which have less than 100 employees..[385] Norway's economy has traditionally been characterized by a small domestic market that is often commodity-based, including fish, timber, and, more recently oil.[386] Fundamental engineering also is an essential part of Norwegian industry, but the knowledge-based industry is still not the primary one of the country. Norway is also famous for a multinational energy company, Equinor, which is the country's biggest company. Fishing is also a leading industry, one exemplified by,

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[383] OECD, GOVERNMENT AT A GLANCE 2017, OECD Publishing, (2017) http://dx.doi.org/10.1787/gov_glance-2017-en.

[384] OECD, FINANCING SMES AND ENTREPRENEURS 2018 164, OECD Publishing (2018).

[385] ERIC IVERSEN, NORWEGIAN SMALL AND MEDIUM-SIZED ENTERPRISES AND THE INTELLECTUAL PROPERTY RIGHTS SYSTEM: EXPLORATION AND ANALYSIS 14, World Intellectual Property Organization (WIPO), 14 (2003).

[386] *Id* at 8.

salmon aquaculture, which is operated mainly by SMEs .

As in many countries, SMEs in Norway sometimes have problems accessing relevant databases and new IPR. According to the report of WIPO, large firms which employ over 300 employees apply for patent protection twenty times more often than eight times more than SMEs.[387] The gap infers that large firms exploit their rights easily compared to SMEs. It is nonetheless to say that protecting the right ownership of IPR is primary conduct promoting the newest technology and industry. The government should focus on modernizing traditional industry by providing established workers in the field education about IPR .

OECD also has repeatedly recommended to the Norwegian government more R&D investment in current and future industries.[388] In 2017, Norway's R&D spending as a percentage of its GDP is below the OECD average at 2.27%,[389] and the lowest among Scandinavian countries.[390]

To enhance innovation performance, the Norwegian government began to allocate more funds for R&D spending for business, especially for SMEs, in the form of ,loans, grants, and tax credits..[391] In 2015, the government introduced a new action plan for entrepreneurship, that

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[387] *Id* at 10.

[388] OECD, REVIEW OF INNOVATION POLICY: 2017 NORWAY 160, (2017) *available at* https://www.oecd.org/norway/oecd-reviews-of-innovation-policy-norway-2017-9789264277960-en.htm; s*ee also* Jan Fagerberg, David C. Mowery and Bart Verspagen, *Innovation-systems, path-dependency and policy: The co-evolution of science, technology and innovation policy and industrial structure in a small,* Centre for Technology, Innovation and Culture, University of Oslo, 2008.

[389] *Id* at142.

[390] Id.

[391] *See* OECD, FINANCING SMES AND ENTREPRENEURS: AN OECD SCOREBOARD 165, OECD Publication (2018), *available at* https://www.oecd-ilibrary.org/industry-and-services/financing-smes-and-entrepreneurs-2018_fin_sme_ent-2018-en.

contained enhanced capital support for SMEs by new seed capital funds.[392] Consequently, in 2017, Norwegian spending on R&D peaked at 2.11%, which almost reached an OECD average of 2.37%.[393] The investment of the government is an ongoing process is essential for improving the dynamism of Norwegian SMEs.

3. IPR in Norway

The Global Innovation Index issued by WIPO in 2018, shows the strengths and weaknesses of using IPR in Norway. According to the report, Norway ranked the 19th most innovative country in the world,[394] which reflects the positive direction of the domestic industry, thanks in part to governmental assistance. The WIPO report also reveals the diagnosed, however, the government has some issues about demerits compared to its excellent domestic infrastructure. In other words, Norway has a strong basis for further development, but field of technology or creative outputs were lower compared to neighboring countries. The paper indicated that Norway's digital input was 13th in the world, but that in the production of creative activities, it ranked 24th.[395] Norway showed a weakness for creative goods and services.,[396] although this implies that the country still much potential to develop based on their natural resources and domestic industry.

Another characteristic of the Norway IPR industry is that it is highly concentrated in several

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[392] *Id*.

[393] OECD, GROSS DOMESTIC SPENDING ON R&D, *available at* https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm (last visited Jun. 22, 2019).

[394] Cornell University, INSEAD, WIPO, Global Innovation Index 2018: Energizing the World with Innovation, (2018) (*available at* https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2018).

[395] *Id* at 346.

[396] *Id*.

specific areas. IPR-intensive industries in Norway are responsible for 25.9% of the country's entire employment, which is a slightly lower figure than the average of EU, 27.8%.[397] The statistics also point out that the profit that the IPR garnered for specific industries that generated more than 51% of total economic activity of GDP in Norway, due to the natural resources industry.[398] Because of the massive contribution of the oil and gas industries in the North Sea, the IPR of the country is biased to the mining industry.[399]

Finally, the Norwegian government offered the public one of the best open governmental system. In the WJP Open Government Index, Norway ranked third among 102 countries for publicizing its laws and making available government data, as well as for the right to information, civic participation, and mechanisms for registering complaints.[400] These results indicate that governmental transparency is a significant factor in an effective system of data sharing and security. Norway's transparent system, then, is in excellent shape for public sector data to be applied to the private sectors.

4. The effort of SME aid in Norway by OGD

a. The OGD process in Norway

Norway built a high-functioning open government system based on a robust digital infrastructure, one that effectively support SMEs. The effort also would transform the dynamic process of public administrations across all policy areas and all levels of collaboration between the

[397] NIPO, INTELLECTUAL PROPERTY RIGHTS-INTENSIVE INDUSTRIES AND ECONOMIC PERFORMANCE IN NORWAY, 4, (2018).

[398] *Id.*

[399] OECD *supra* note 388 at 6.

[400] *See* WJP, Open Government Index 2015, (2015) *available at* http://data.worldjusticeproject.org/opengov/.

public and private sectors, for citizens and businesses alike. Norway's open government can be expected to the linchpin for a virtuous circle that will see the public sector provide useful data service to SMEs in need, which will in turn produce good and service that enhance the public interest..

The Digital Agenda for Norway (also known as the "White Paper;"2016) emphasized transforming modernized public data to a digital format for enhanced public service. The White Paper suggested several ground rules by the Ministry of Local Government and Modernization might facilitate easy access for citizens to government data (KMD): (1) A user-centric focus, (2) ICT as a significant input for innovation and productivity, (3) Strengthening digital competence and inclusion, (4) Effective digitization of the public sector, and (5) Sound data protection and information security.[401]

The KMD and the Norwegian Agency for Public Management and eGovernment (Difi) are the central public bodies that are boosting OGD improvement in Norway. Difi, mainly performs a pivotal role in setting priorities, for the implementation of the digital agenda, and developing cross-cutting guidelines and standard components in "Project Wizard."[402] Difi launched a new ICT business model combining platforms among each public sector to set a default data platform that reduces the cost for further data usage.[403]

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[401] OECD, DIGITAL GOVERNMENT REVIEW OF NORWAY: BOOSTING THE DIGITAL TRANSFORMATION OF THE PUBLIC SECTOR, OECD DIGITAL GOVERNMENT STUDIES, OECD PUBLISHING, 8, (2017).

[402] *Id*. at 10.

[403] *Id*. at 21

b. Efficient achievement of Norway

As described above, the country's R&D to GDP ratio appears lower than the OECD average, but it does not mean that Norway gets left behind when it comes to innovation compared to other countries. By the beginning of the 21st century, besides, Norway was one of the richest countries in the world.[404] In the ICT area, Norwegians' access to the internet also places it among the highest group of OECD countries in that category.[405] Therefore, the Norwegian government maintains an efficient innovation strategy. Fagerberg pointed out that the key to efficiency resulted from improved labor productivity, which has grown-up more than 2.5% every 30 year.[406] The country's skilled labor force has constantly developed leading technologies in the fishing and shipping areas, which traditionally play a leading role in the Norwegian economy.

A, cost-effective, national information managing process is still needed to achieve a balanced decision-making toward SMEs on intellectual property issues. The Norwegian government finances the majority share of R&D with local universities and institutes within the public sector.[407] This "small-scale decentralized" development method, which is characterized to fit for local approach. It succeeded to provide recent information to SMEs without huge R&D cost. While significant government investment focuses on large firms, the segmented aid results in et Norwegian industry having a much more heterogeneous structure, with a small number of global firms and a large group of family-owned ones.

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[404] Norwegian GDP/ capita is $63,760 4th richest (https://data.oecd.org/gdp/gross-domestic-product-gdp.htm) (last visited June. 22. 2019).

[405] Rate of Internet Access, (*available at* https://data.oecd.org/ict/internet-access.htm) (last visited Jun 2019).

[406] Fagerberg, Mowery, & Verspage, *supra* note 388 at 6.

[407] *Id*. at 4

c. Example: Salmon Aquaculture

A representative case of Norwegian government investment is in aquaculture, especially , salmon fishing, investment in which reflects the government's effort to keep a balance between large firms and SMEs. The government has succeeded in building the most productive fishery industry of the world, which earned 61.5b NOK ($6.5 billion) in 2016, and the third highest export revenue of Norway. Salmon sent abroad also constituted 50% of all salmon exported in the world. Moreover, the industry keeps growing by 10% annually, and the growth will probably continue given the growth of the urban population and the growing number of health-conscious consumers.[408]

Since the fishing industry has drawn a higher degree of technological support from the 1980s, the Norwegian government has supported aquaculture to help achieve not only scientific but also educational support to fishermen. The government invested in this entire industry and made it a far more science-driven business via biotechnology, production, distribution, and processing from experimental farming.[409] As a typical approach of the government, each research subject participated in the R&D. For instance, 29% of 2003 R&D expenditure was contributed by industry 53%, by research institutes, and, and 18% by university and other higher educational bodies.[410] There is also specialized education at the university level about large-scale fishing, which is up-to date research conducted with institutes and governmental services.[411]

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[408] *See* EY, THE NORWEGIAN AQUACULTURE ANALYSIS 2017, EYGM, 9, (2017).

[409] *Id*. at 37.

[410] Heidi Wiig Aslesen, *The Innovation System of Norwegian Aquaculture Salmonids, Centre for Technology*, Innovation and Culture, University of Oslo, 13 (2007).

[411] *Id*. at 10

More than 7,000 people worked in the fish farming industry in 2016,[412] which grew 14% compared to 2015. Among industry companies, 94% are SMEs.[413] These firms do not have sufficient R&D capability themselves but survive by benefitting from a "science-based process," research they receive from skillful research sectors like universities.

Moreover, the requirement of fishing licenses also helps to prevent Norway from overusing its natural resources. The fishery license is issued by local governmental bodies, which have a better knowledge for domestic business and the environment than does the central government in Oslo. The diverse industrial structures make Norwegian SMEs survive against too large companies. The coexistence of SMEs and large companies has not only helped Norway develop a heterogeneous business structure but also has made for a robust fishing industry.

d. Summary

The application of IPR in Norway has been widespread in industry. The Norwegian government has changed the fishing industry from an experimental to a knowledge-based one. To achieve this change, people from government, business, and the universities were involved. The Norwegian salmon industry developed in a way that involved a balance between globalized aquaculture companies small, family-sized farms. Although its R&D expenditures are lower than other countries, Norwegian efficiency proves that systematic cooperation among the government, business, and research sectors play a key role in developing this industry.

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[412] EY, *supra* note 408 at 6; *see also*, Canadian Trade Commissioner Service, *Aquaculture Sector Profile – Norway,* (the report also counted 5,500 served with aquaculture in 2012.) (2012).

[413] EY *supra* note 408 at 21.

D. Summary

The challenges of common pool resources concern mainly action problems among resource users. Many researchers and politicians are concerned about the maintenance of limited resources in a common pool. As responses to this challenge, governmental compulsory regulation, or private ownership to forcefully benefits are usually acceptable.[414]

The private sector alone or government alone has failed to sustain the usage of resources. We can divide the utility of resources into two factors: that efficiency and distribution. As court records in the U.S. show, private sectors entities achieved huge benefits using their creativity. Digitalization from old platform successes not only decreased the long-term cost of publication but also improved the research environment to lawyers. However, technological reforms isolated some people who are restricted to the service for cost or lack of knowledge to accessing legal materials in public libraries.

Governments also expose weakness in effective achievement in open-data service. Public institutes have continuously distributed large public data sets, but many of the databases do not correspond to the demands of the real market environment. Many professionals at Korean SMEs criticized datasets published by government for being out of date or irrelevant to their needs. The limitations of government data set might decrease the reliability of government institutes and contribute to low usage of database to SMEs.

The advantage of the polycentric model is that encourages experimentation by multiple

[414] *See* Hardin *supra* note 21.

parties.[415] Communities are alternative action group of the resources helping sustainable development in self-governance.[416] As shown below, this model also presented better results in transparency and accountability both below:

	Design Principles	Analysis of Models
Transparency	D1	Korea, Norway
	D2	Korea, Norway
Accountability	D3	US, Norway
	D4	US, Norway
	D5	none

Figure 6. Applying the Design Principles to the Countries' Model

The multi-stakeholder governance, which includes both public and private-sector involvement, proved its efficiency and fairness in the market in the Norwegian salmon industry. Effective polycentric governance also has difficulties in gathering and maintaining actual vital tasks. However, there are many successful cases for sustainable developing models, and it possible to apply these to the OGD.

[415] *See* Elinor Ostrom, *A Polycentric Approach for Coping with Climate Change* 6, World Bank Policy Research Working Paper No. 5095 (2009).

[416] OSTROM *supra* note 10 at 18-21 (1990) (potent of governance as the third party of ownership).

V. Implication: Further Works and Suggestions

A. The ambiguity of current OGD

1. Purpose of OGD: Open Government or Open Data?

After a few decades of the open-government movement, computer and communication technological developments, again raise some serious issues. Computers, the internet, and big data have combined the effects of open government with technology.[417] The new technology has changed the view of citizens from the beneficiaries of government data to participants in data policy. As presented above in previous Chapters, citizen groups and governments now carry out new public services based on public data. On the other hand, there are critics who contend that the collaboration between technology and institution blurs the meaning of open government as a fundamental right in the new technologies.[418]

OGD, as an essential political issue came to the fore in the Obama Administration.[419] President Obama's Open Government Directive stressed the principles of transparency, participation, and collaboration.[420] To meet these goals, the administration suggested an open format, consisting of data that is independent, machine-readable, and made available to the public without restrictions

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[417] Technology has affected to the law many times. *See e.g.* Katz v. United States, 389 U.S. 347 (1967) (expanded the Fourth Amendment's protections from the right of search and seizures of an individuals and also, the Computer Fraud and Abuse Act (CFAA) enlarges its protection to civil cases.)

[418] *See* LESSIG *supra* note 232.

[419] WHITE HOUSE, MEMORANDUM ON TRANSPARENCY AND OPEN GOVERNMENT, January 21, 2009 *available at* https://obamawhitehouse.archives.gov/the-press-office/transparency-and-open-government.

[420] *Id*.

that would impede its reuse.[421] About the same time as this approach was implemented, many developed countries announced their OGD plans for future data policy.[422] Of course, OGD's goals differ from country to country.

The tension of OGD might be stated as one between the openness to public access to data and enhancing industrial development. Yu and Robinson insisted that the current OGD has difficulty in harmonizing the concepts of "open government" and "open data."[423]

Compared to the early stage of open government, the Obama Administration recognized the concept's importance for a growing economy, job creation, and solving many social problems.[424] Social movements aided by new technology, showed new approaches to information. For instance, Creative Commons (CC) provides a platform share scholars article based on voluntary participation and contract.[425] Administrations also believed that the leverage technology provided would contribute to lessening major social problems.[426] However, the gap between the private and public sectors in technology and different perspectives undercut the positive impact of OGD.[427] In the first year of Data.gov, for example, there was a huge decline in the use of public datasets by

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[421] *Id*.

[422] *See* OECD &UK CABINET OFFICE, OPEN DATA WHITE PAPER, (2012).

[423] Yu & Robinson *supra* note 37 at 180.

[424] *See* WHITE HOUSE, OPEN GOVERNMENT: A PROGRESS REPORT TO THE AMERICAN PEOPLE (2009) *available at* https://obamawhitehouse.archives.gov/sites/default/files/microsites/ogi-progress-report-american-people.pdf

[425] For instance, Creative Commons (CC) is a non-profit organization that roles to share intellectual property with a several steps of agreements: *see* https://creativecommons.org/

[426] *See* OECD &UK CABINET OFFICE *supra note* 422 at 20.

[427] Yu & Robinson *supra note* 37 at196.

public agencies.[428]

With a failure of understanding, each government interprets OGD following its inclinations and ideology, particularly in how it approaches two issues. The first is how to set the gateway of public access when a new data user tries to make innovative use of the data.[429] The second is whether the primary purpose of government data is greater efficiency and public accountability.[430]

In chapter IV, we looked at how each country's OGD policy is consonant with its industrial or political circumstances Also, some local administrations operate their public data services to provide transparency for their communities and provide information to solve social problems.[431] For instance, the City of Chicago has provided open-data service since 2011, while the State of Illinois has its own open data portal.[432]

The "open-government movement" has evolved with the development of technology. The term no longer refers only to government accountability; now, citizens also participate in data development by reusing it with enhanced technological approaches and contribute to social development in the process. Also, governments anticipate that citizen engagement in data usage will help find solutions to problems they have not been able to solve. This engagement reflects the nature and functioning of a democracy, in which increasing participation in a civic issue reflects

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[428] Alon Peled, *When Transparency and Collaboration Collide: The USA Open Data Program*, JASIST. 62. 2085, 2088 (2011).

[429] Yu & Robinson *supra note* 37 at 182.

[430] *Id*.

[431] *See in general* OECD *supra* note 40; UK White Paper *supra* note 422; Norway *supra* note 401; South Korea Data *supra* note 370.

[432] *See* State of Illinois Data Portal *available at* https://data.illinois.gov/dataset (last visited Mar. 2020); *see also* Chicago Data Portal *available at* https://data.cityofchicago.org/ (last visited Mar. 2020).

the accurate will of people.

However, one long-term issue is whether open government data increases government transparency or accountability. Currently, the main focus of OGD is on economic values rather than social reforms, an issue with which approaching governmental information. It is nonetheless to say the less accountability might affect transparency of government and economic benefit of OGD.[433]

Accepting and adapting new technology is always an important process. The development of information technology involving the reuse of public data offers new possibilities for democracy and economic development. Despite rapid change, however, transparency of government as the standard of policy and constitutional values must be maintained. If government undermines the priority of open government data, economic innovation might be unsustainable. Unfortunately, some factors indicate that governments are losing the balance between transparency and economic development. In 2011, the Obama administration launched another official data portal, "Good Government," to ensure both transparency and accountability.[434]

2. A balance between privacy and open public data

Another OGD issue is privacy risk; users' PII must be secured under legal process depends on types of information. For instance, HIPAA Privacy Rule defined the protected personal information

[433] *See* Jennifer Shkabatur, *Transparency With(out) Accountability: Open Government in the United States*, 31 YALE L. & POL'Y REV. (2013).

[434] *See* WHITE HOUSE, 21ST CENTURY GOVERNMENT, *available at* http://www.whitehouse.gov/21stcenturygov (last visited March 8, 2020).

and its protection under the law.[435] As data science technologies develop, public data could be exploited to reveal private information. Ohm raised the concerns that the amount of reusable public information through the Internet raises the possibility of de-anonymization.[436] Since Samuel D. Warren and Louis D. Brandeis recognized that privacy rights should not interfere with information flow when that information us socially valuable,[437] data policy has considered the privacy risk of open public data.

The primary goal of public-access statutes, including the FOIA, is to take advantage based on a better background of the decision. It does not mean that the individual rights allow for some agencies to use privacy as a 'shield' to prevent appropriate disclosure.[438] Rather than involving only a bureaucracy process, privacy rights strengthen individuals' control over important confidential facts about their lives.[439]

A judicious policy on access to public data depends on the will of practical decision-makers. Duncan argued that "data, just like any other valuable resource, can and often does fall into the control of people or organizations politically."[440] For example, UCLA denied a public records

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[435] *See e.g.*, the HIPAA Standards for Privacy of Individually Identifiable Health Information (the "HIPAA Privacy Rule") define individually identifiable information as Information that "identifies the individual" or information "'[w]ith respect to which there is a reasonable basis to believe the information can be used to identify the individual." 45 C.F.R. 160.103 (2010).

[436] *See* Ohm, *supra* note 2.

[437] Samuel D. Warren & Louis D. Brandeis, *The Right to Privacy*, 4 HARV. L. REV. 193, 196 (1890).

[438] Douglas J. Sylvester & Sharon Lohr, *The Security of Our Secrets: A History of Privacy and Confidentiality in Law and Statistical Practice,* 83 DENV. U. L. REV. 147, 190 (2005).

[439] FTC, PRIVACY ONLINE: FAIR INFORMATION PRACTICES IN THE ELECTRONIC MARKETPLACE-A REPORT TO CONGRESS (2000).

[440] George T. Duncan, *Exploring the Tension Between Privacy and the Social Benefits of Governmental Databases*,

request by faculty members on an undergraduate admission committee on ratio changes of African-American first-year students. The university announced the reason was that the request involved "serious privacy concerns."[441]

Because of technology, protecting private information sometimes seems difficult. According to an experiment conducted by Latanya Sweeney, making a de-identification attack using algorithms is easy based on current open datasets.[442] The algorithms can extract private information by finding common elements among several datasets and filling out the masked parts.

She demonstrated that 87 percent of people who lived in the U.S. are identifiable with simple information like zip code and date of birth.[443] Many commercial parties already use the data analyzing process for their businesses to predict customers' demands. For example, Netflix can predict personal preferences for movies on the basis of very little viewer information, such as individuals' ratings of two movies.[444]

A view of the property to the data also makes it worse to approach data policy difficult. Many people believe their private information is a property right, but the property model is not enough to provide sufficient data protection.[445] That is because individuals cannot completely control all

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in A LITTLE KNOWLEDGE: PRIVACY, SECURITY AND PUBLIC INFORMATION AFTER SEPTEMBER 11 71, 82 (Peter M. Shane, John Podesta, and Richard C. Leone, ed., 2004).

[441] Seema Mehta, *UCLA accused of illegal admitting practices*, LA TIMES, Aug. 30, 2008.

[442] *See* Latanya. Sweeney, Simple Demographics Often Identify People Uniquely. Carnegie Mellon University, Data Privacy Working Paper 3. Pittsburgh 2000.

[443] *Id.*

[444] Ohm *supra note* 2 at 1720 (Netflix de-anonymization makes the risk of re-identification to the utility of the dataset).

[445] Jane Yakowitz, *Tragedy of the Data Commons,* Harvard Journal of Law & Technology Volume 25 (2011) (a simple

their private information in cyberspace. Lessig pointed out vague boundaries on what kind of data is private or not.[446] Worse, the boundaries are not determined by the data owners but by governments. Our individual internet searching is a private action but it is also a record data to internet service providers. Individuals don't completely own private data because they don't have actual possession of it. Therefore, market forces play an important role in safeguarding, or not, privacy. and political approaches to privacy is a more practical way to protect the right.[447]

B. The necessity of pooling

1. The Misuse of IP Rights

In patent law, the courts prohibit exclusive rights to intellectual property when those rights limit innovation of "useful arts," including those registered in patents. In *Motion Pictures v. Universal Film*, the Supreme Court decided that a monopoly might arise from the misuse of patent rights rather than the existence of restraint on competition or market dominance.[448] It was considering the unenforceability of patent rights given the reward of creative works and total public interest.[449]

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property model for information privacy by noting that consumers will foreseeably sell their alienable information for too little compensation. She also embraces many of the aspects of a property model, but also proposes that government regulation should provide a right of exit (or claw-back) and a realm of inalienability.).

[446] Lessig *supra note* 232 at 220.

[447] *Id* at 228.

[448] *See* Motion Pictures Patents Co. v. Universal Film Mfg. co, 243 U.S. 502 (1917).

[449] HERBERT HOVENKAMP, MARK D. JANIS, MARK A. LEMLEY, CHRISTOPHER R. LESLIE, IP AND ANTITRUST, Vol.1. 3-6; '9 (Wolters Kluwer 2016).

The court's ruling on patent misuse called to mind legislation like "The Patent Misuse Reform Act" and underscored the limits of the patent system.[450] However, the misuse of IP still functions to protect the public interest in the market based on the unfair competition law and patent law. Posner explained the patent misuse doctrine, noting that the principle only arises as an equitable defense to a charge of patent infringement, to which is not applicable.[451] Likewise, in copyright rulings, the fourth, fifth, and ninth circuit courts have accepted the misuse doctrine based on the public interest, and the other circuit courts have acknowledged the misuse of copyright and antitrust law.[452]

2. Historic Lesson from Traditional IP Pool

Since database pooling was instituted only relatively recently, it is helpful to look closely at its history to understand the pooling's advantages and disadvantages data pooling is a new development of the digital economy. As a surprising development of information technology, the development of many new business models requires large quantities of data. Many retail services, such as Target and YouTube, recommend suitable list reflecting spending patterns from consumers in similar businesses.

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[450] The Patent Misuse Reform Act of 1988, Pub. L. No. 100-73, 102 Stat. 4674 (§ 274 "(4) refused to license or use any rights to the patent; or (5) conditioned the license of any rights to the patent or the sale of the patented product on the acquisition of a license to rights in another patent or purchase of a separate product, unless, in view of the circumstances, the patent owner has market power in the relevant market for the patent or patented product on which the license or sale is conditioned").

[451] *See* USM Corp. v. SPS Technologies Inc., 694 F.2d 505(1982).

[452] Stephen Zinda, *Preserving the Copyright Balance: Why copyright misuse should invalidate software licenses designed to prohibit resale and oust service market competition*, 48 Houston Law Review, 1248-1254 (2012).

According to a McKinsey research, the data pool for autonomous vehicle industry has the potential to create value of approximately $450-750 billion by 2030.[453] Understanding the history of patent pooling helps us understand relationship between the efficiency usage and monopolization exploiting the exclusiveness.

a. Early patent pools

The first trial of patent pooling emerged in the U.S. for sewing machine manufacturers to share parents occurred in 1856.[454] The early stage of the patent pool movement tried to protect a monopolistic position and avoid competition in the business area by establishing a patent-based trust.

Patent owners and enterprises thought that pooling is a legitimate action under the doctrine of freedom of contract. In *E. Bement & Sons v. National Harrow Company*, for instance, the Supreme Court rejected applying the Sherman Antitrust Act of 1890 to invalidate the narrow pool that was established by 22 companies that occupied 90% of the market.[455] The Court held that setting prices is one of the purposes of patent law, noting that "the general rule is absolute freedom in the use or sales of patent rights under the patent law of the United States. The very object of these laws is

[453] MICHELE BERTONCELLO ET AL, MONETIZING CAR DATA – NEW SERVICE BUSINESS OPPORTUNITIES TO CREATE NEW CUSTOMER BENEFITS, MCKINSEY REPORT, (2016), *available at* https://www.mckinsey.com/~/media/McKinsey/Industries/Automotive%20and%20Assembly/Our%20Insights Monetizing%20car%20data/Monetizing-car-data.ashx.

[454] Adam Mossoff, *The Rise and Fall of the First American Patent Thicket: The Sewing Machine War of the 1850s*, Arizona Law Review, Vol. 53, 165, 194 (2011) (listing a timeline of the patent pooling purposing monopoly in the market).

[455] *See* E. Bement & Sons v. National Harrow Company, 186 U.S. 70 (1902).

monopoly….”[456] During this period, the exclusive right was recognized as one of the fundamental elements of the patent system, which is independent from antitrust law.

Not long after the case, the view that patent rights are absolute began to change. In its *Standard Sanitary* decision the Supreme Court ordered the break-up of the bathtub enameling patent pool in 1912.[457] The Court held that the use of a patent and the resulting monopoly is conferred by law and that the control of price and the quality of goods is illegal under the Sherman Antitrust Act.[458] Therefore, the patent right cannot overwhelm the economic order whatever for its good intention of those in the pool.

In contrast to attempts at monopolization some pooling worked to end patent gridlock by sharing technologies to help develop a particular industry. The U.S. government participated in making a pooling against the gridlock in the American avionics industry, which impeding innovation.[459] Until the beginning of World War I in 1914, , the primary patent holders, Orville Wright and Glenn Curtiss, had continued to engage for several years of litigation in flight market. Despite the high demand for airplanes, other companies were reluctant to produce aviation products because they were threatened with lawsuits from two major manufacturers.[460]

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[456] *Id* at 91.

[457] *See* Standard Sanitary Mfg. Co. v. United States, 226 U.S. 20 (1912).

[458] *Id* at 21 (Bement v. National Harrow Co., 186 U. S. 70, and Henry v. A. B. Dick Co., 224 U. S. 1, distinguished).

[459] George Bittlingmayer, *Property Rights, Progress, and the Aircraft Patent Agreement*, The Journal of Law and Economics 31, no. 1 227, 231-232 (1988) (After the Wrights invented first flying system in 1903, Glenn Curtiss registered patent in 1908 for a method of wing flap system supported from Bell center. The Wrights sued Curtiss for patent infringement in 1909, claiming that
their method applied to wing flaps as well as wing twisting.)

[460] *Id*. (The Wrights-Martin Company sued some cases for infringement of patent arguing damage for $1,000 per

As the U.S. prepared to enter the war., the National Advisory Committee for Aeronautics sought to restore harmony to both companies by suggesting a cross-licensing agreement.[461] As a result, most patent holders, including the two companies signed in patent cross-licensing agreement and formed the Manufacturers Aircraft Association (MAA), three months before the U.S. declared war on Germany in 1917.[462] Each member of the MAA, granted cross-licensing in the pool on a royalty-free basis, agreed to distribute funds by the board of arbitration.[463]

There were also similar issues for establishing the MAA, which seemed to go against the antitrust law. However, the Attorney General announced that the MAA did not contravene American law, including antitrust law.[464] Eventually, Wright and Curtis earned $2 million by 1937, each receiving he maximum royalty in the agreement until 1937, and MAA also fully contributed to the war.[465]

Similarly, the U.S. navy also contributed a radio communication patent pool independent of the British domination of international radio communication in 1919.[466] The Radio Corporation of America (RCA) joined with major radio companies, including GE and AT&T, to consolidate a uniform standard in telecommunication.[467]

In the early stages of the patent pool movement, some predicted that it would decrease

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airplane).

[461] *Id* at 232; Manufacturers Aircraft Ass'n, Inc. v. The United States, 77 C. Cls., 481, 484 (1933).

[462] *Id*.

[463] Michael J. Madison*, Information abundance and Knowledge commons*, *in* USER GENERATED LAW, RE-CONSTRUCTING INTELLECTUAL PROPERTY LAW IN A KNOWLEDGE SOCIETY, 37 (Edward Elgar Pub, 2016).

[464] Mattioli *supra* note 52 *at* 132.

[465] Bittlingmayer, *supra note* 459 at 234.

[466] *See in general*, GLEASON L. ARCHER, HISTORY OF RADIO TO 1926, 122-176 (NEW YORK TIMES 1971).

[467] *Id*.

competition. The enterprises established the pool to avoid recently enacted antitrust regulations, thus protecting their enterprises behind the exclusive rights of a patent. However, it is ironical the government established market dominant corporation in active market remembering the main reason for patent law in the Constitution was to "promote the progress of science and useful arts."[468]

After *Standard Sanitary Mfg. Co. v. United States* the court changed he relationship between the exclusive rights of those the patent pool as a subject matter of monopolization suits, as provided in antitrust law. The decision helped policymakers to build government-facilitated pools like the MAA, which resolved protracted conflicts between the two major airplane manufacturers so helped stimulate the growth of the entire industry, while contributing to winning World War I.[469]

b. The Rule of Reason

The Rule of Reason has undergirded economic analysis leading to policy-making that prescribes rules and fact-based rationales. . In *U.S.* v. *Addyston Pipe & Steel Co.,* the Sixth Circuit court explained reasonable restraints were permissible only if their primary purpose when they attempted to restrain trade, then the agreement was invalid.[470] The court held that the reasonable restriction of avoiding ruinous competition, noting that the public benefitted from competition.[471]

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[468] U.S. CONST art. I § 8, cl. 8. (Patent and Copyright clause of the Constitution: [The Congress shall have power] "To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.").

[469] Bittlingmayer, *supra note* 459 at 234 ("Largely because of these functioning commons if patented inventions, airplanes were the built, and the war was won.").

[470] U.S. v. Addyston Pipe Steel Co., 85 F. 271, 279 (6th Cir. 1898).

[471] *Id.*

The rule of reason applied to IP pooling cases. *Standard Oil Company v. the United States* held that one should examine patent exchange agreements to consider whether the companies involved control the national market or restrict competition.[472] It limits correct analysis, which undertakes an elaborate economic inquiry whether it effects to suppress or unduly to restrict competition.[473]

The government viewed the agreement, its exchange of patent rights and division of royalties, as a violation of the Sherman Antitrust Act, which prohibits the restraint of interstate commerce.[474] Justice Brandeis narrowed the reason for patent pool prohibition to the monopoly or restriction of competition, with the need for the plaintiff to prove the factual showing of illegality rather than the existence of the pool and its price control ipso facto doing so.[475] Compared to both cases, the rule of reason permits the allocation of benefits in the pool unless it blocks innovation of public interests. Such interexchange through licensing may promote a more competitive environment rather than discouraged competition.[476]

In 1970, the DOJ enumerated several antitrust considerations for patents and licensing pools regarding *per se* violations of IP laws, including the "Nine No-Nos".[477] However, the *per se* rule

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[472] Standard Oil Company v. United States, 283 U.S. 163, 168 (1931).

[473] Id.

[474] *Id* at 172 (Before joining the patent pool, the four companies were in litigation for "cracking" processes by which the yield of gasoline from crude petroleum.)

[475] *Id* at 179

[476] *Id* at 181.

[477] *See* Pollock, Earl E., Donald W. Banner, Tom Arnold, George E. Frost, Sigmund Timberg, Jerrold G. Van Cise, and Bruce B. Wilson, Panel, *Discussion: Licensing, Patents, Trademarks and Kmow-how*, Antitrust Law Journal 42, no. 3 681-98 (1973), *available at* www.jstor.org/stable/40842009 last vistied April 16, 2020 (The nine per-se rules below: (1) Tying the purchase of unpatented materials as a condition of a patent license, (2) Requiring the licensee to assign back subsequent patents, (3) Restricting the right of the purchaser of the patented product in the resale of the

has been criticized by the argument that unconstrained licensing increases the value of patents and discourages innovation. The DOJ's Antitrust Division promulgated "Antitrust Enforcement Guidelines " in the 1990s, allowing licensure for pro-competitive effects in related markets.[478] Also, the DOJ and the Federal Trade Commission (FTC) released new "Antitrust Guidelines for the Licensing of Intellectual Property" (IP Guidelines). This new guidance excluded the presumption of licensing in Nine Nos of IP pools rather than evaluated under the rule of reason based on anticompetitive effects to a related market.[479] The rule of reason suggests a broader scope to decide why or how a specific circumstance may appear for unpredictable market changes.

c. Rule of Reason Example: MPEG LA

Among the many IP pools, an MPEG Licensing Administration (MPEG LA) patent pool shows how a successful pool can avoid litigation risk and high transaction costs for using related patents. In its early stage, this pool managed to license for core digital video compression standards for the MPEG-2 platform. However, the pool currently coordinates hundreds of patent holders, including companies and institutions in nearly 100 countries with over 6,000 licensees for various fields in the electric communication device industry.[480]

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product, (4) Restricting the licensee's ability to deal in products outside the scope of the patent, (5) A licensor's agreement not to grant further licenses, (7)Mandatory package licenses, (6) Royalty provisions not reasonably related to the licensee's sales (8) Restrictions on a licensee's use of a product made by a patented process, (9) Minimum resale price provisions for the licensed products).

[478] Richard Gilbert, & Carl Shapiro, *Antitrust Issues in the Licensing of Intellectual Property: The Nine No-No's Meet the Nineties*. Brookings Papers on Economic Activity. 28. 283, 286 (1997).

[479] *Id* at 287; *see also* U.S. DEPARTMENT OF JUSTICE AND THE FEDERAL TRADE COMMISSION, *supra* note 227.

[480] *See* Tom O'Reilly, *MPEG LA Introduces One-Stop License for Qi Wireless Power*, MPEG LA LLC, (Jan. 14, 2020) *available at* https://www.mpegla.com/media/ last visited May. 2. 2020.

According to a review letter written by the DOJ in 1997, the joint package licensing "may be reducing transactional costs, cleating blocking positions, and avoiding costly infringement litigation."[481] The DOJ considered several pro-competitive elements brought about by approval of the establishing pool. The licensing agreement among the patent holders is likely to reduce time and expense compared to how companies would function under the respective joint contract.[482] Besides, the agreement has features designed to enhance a pro-competitive environment by adopting independent experts.[483] Moreover, it clearly specified freedom of licensing contract and used alternative technology, which is not obligatory to keep the pool.[484] In this regard, the DOJ decided the pool would provoke a pro-competitive effect and improve current technology rather than resulting in price control.

One of remarkable point of the MPEG case was the participation of one of non-profit parties on the neutral side. Columbia University was one of the founding members of MPEG-LA and the only a non-profit organization among the trustees.[485]

The university participated in the pool as the holder of an algorithm for image processing. Because of the competitive business relationships among the other members of MPEG-LA, the university was chosen to draw up a neutral standing rule of MPEG-LA in objective view point.

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[481] U.S. DEPARTMENT OF JUSTICE, MPEG LA Business Review Letter, (1997) (last visited Apr. 16th 2020) *available at* https://www.justice.gov/atr/response-trustees-columbia-university-fujitsu-limited-general-instrument-corp-lucent.

[482] *Id*.

[483] *Id*.

[484] *Id.*

[485] Bob Nelson, *Justice Department Approves Digital TV Patent Pool; Columbia, Only University In Group, To Receive Fees,* COLUMBIA UNIVERSITY NEWS, July 1, 1997.

Because of the neutrality of the non-profit organization, the other entrepreneurs were able to keep participating in the pool.

MPEG LA achieved a stable earnings model, meaning that the pool rated all essential patents equally to attract more participants. This measure helped to build a sustainable. non-exclusive business community more than twenty years after the pool was established. At last, the pool requested a DOJ inspection to clarify its antitrust position so as to reassure future participants. Considering the efforts, there is no doubt that MPEG LA is a model IP pool.

d. The implication of patent pool against the Anti-commons

As discussed, the effects of pooling are mixed in terms of gathering valuable resources. Establishing a pool for sharing useful information at a reasonable price can cause a monopoly in terms of controlling costs in a specific market. However, the establishment of a data pool, can reduces the transaction costs between parties. The data industry in particular needs more exchanges of up-to-date information during the process of cumulative innovation. Operating high-quality data analysis demands a large dataset, and it is not predictable by a person. Therefore, considerate communities help solve the anti-commons problem in the data industry.

Some organized communities have succeeded in sharing valuable resources.[486] They have managed limited resources without abusing under the practical rule for maximizing everyone's interests. They have succeeded in controlling interests for the present then while also believing in the importance of preserving future interests. In this regard, adopting pooling helps IP owners to decrease transaction costs and elfish behaviors in related fields of business. They can save costs

[486] *See* Ostrom *supra* note 10.

and time in the bundle of datasets, as compared to individual contracts.

The pool is a central organization that is formed by a number of consenting parties organized around assets in which the parties have an interest. Its members can use the IP under its rule, and the pool has to manage the assets for ready- to-use status.

A MPEG patent pool is an example of how to resolve equitably the problem of intellectual property underuse. MPEG LA treats members equally in terms of licensing fees or other IP transactions. Not all patents have the same value in the market. But it is an essential rule in the pool to tie members in the pool and hold it. This prevents a struggle for leadership and allows the pool to attract new members more easily.

Some members would give up the value of their IP, but the pool will benefit its members more by decreasing transaction costs and increasing participants. The pool is powerful when it operates under reasonable rules, and when it adopts long-term purposes that serve many members' interests compare to IP trade, but also it makes faster cumulative innovations.

C. Useful principles

1. Transparency and Accountability

Various legal cases have been made and examples offered for sharing intellectual property. If data-holders make reasonable choices, how will the pool attract them? Stakeholders usually select predictable strategies whose expected benefits will exceed expected costs.[487] Since all decision-

[487] *Id* at 83.

makers cannot calculate all the related variables, the decision might prove irrational. However, a piece of more important related information helps to decide a better selection.

In helping to develop a new industry, lawmakers should foster better transparency and accountability of information between data holders and users. The existence of shared norms will decrease the costs for surveillance to IP management to maintain the communities and industry. Monitoring costs for courts, the police, and unfair competitive agencies consume financial resources that might be utilized productively for other purposes. If the legal system fails to contribute to a healthy community, then resources might be confined to a few people who distort the market; ultimately, the broader society will pay for this imbalance.

It is hard to determine the best model of a data pool because the data industry is changing so quickly. However, the best patent pools to date offer some guidelines about how pools might be changed. Monitoring and balance among various parties are essential to building a sustainable pool itself, and Ostrom's research suggests basic principles for doing so. In a robustly competitive market, the parties in a pool strive for short-term profit maximization; this might lead to the break-of the pool community and the inefficient use of resources.

As Hardin pointed out, individuals weigh potential losses more heavily than anticipated profits.[488] As a result, a pool is hard to maintain because it focuses on sustainable organization against threats of uncertain risks. In this regard, the pool and its institution need to provide accurate estimates to recent developments rather than those of the more distant past.[489] Therefore, the

[488] *See* Hardin *supra* note 21.

[489] OSTROM *supra note* 10 at 111.

legal and political approaches for the pool would approach the practical community facing specific problems.

2. Legal Implications

Whether a pool, silo, or archive relaying relevant information to a third party is an efficient way to save and utilize data as common resources is an open question. Many scholars argue that having a limited pool to access is favorable to maintaining the rights of IP holders.[490]

The goal of saving the collected information in the pool attracts users as customers, so that the pool can benefit from the economy of scale.[491] In their mixed-status as data publishers and data keepers, subjects encounters an ambiguous position for both roles. On the other hand, the number of datasets is an essential factor in the success of the data pool.. As a result, the pool will have low transaction costs in licensing, but also preserve valuable information as a kind of commons.

The legal effort is essential to preventing the adverse effects of torts and other liability suits .[492] Intellectual property law exists to protect intangible assets, and a licensing contract is also a necessary legal action for being able to share this information in a pool.[493]

The *Sui generis* protection in Europe and South Korea having designated databases as a subject of copyrights law reflects the development of database management. Copyrights law plays a primary role in data protection and sharing. Lessig argued for the distinctive non-profit uses of

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[490] *See* Sadie L. Honey, *Preservation of Electronic Scholarly Publishing: An Analysis of Three Approaches* portal: Libraries and the Academy 5, no. 1 59-75 (2005).

[491] DONALD J. WATERS, *Preserving the Knowledge Commons, in* UNDERSTANDING KNOWLEDGE AS A COMMONS: FROM THEORY TO PRACTICE, 145, 157 (Charlotte Hess & Elinor Ostrom eds., 2006).

[492] *Id* at 160.

[493] *See in general*, Barnett, *supra* note 182.

intellectual property as a significant issue for further discussion.[494] Of course, a pool plays s a role in furthering the Constitution's view of intellectual property as promoting "the Progress of Science and useful Arts."

[494] LAWRENCE LESSIG, THE FUTURE OF IDEAS: THE FATE OF THE COMMONS IN A CONNECTED WORLD 249 (Knopf Doubleday Publishing Group, 2002).

VI. Conclusion

This dissertation has examined the issue of intellectual property in data development and management and has argued for the pooling movements, in which participating individuals, governments, and enterprises work to reduce the underuse of valuable future resources.

The governance of IP, including databases, remains fragmented. The possession of a database as a sort of IP makes it difficult to a build a procompetitive atmosphere considering the new wave of innovation, such as big data. Although the difficulties of fragmentation in the database industry remains, alternative paths are being considered by standing on the giant's shoulder.

The potential for a digital divide in terms of accessibility of information is not only an economic issue but also one of fundamental rights. The anti-commons problem in intellectual property has been raised broadly. Economically, the inefficient usage of data prevents cumulative innovation, a fundamental development model by which advanced research contributes to new knowledge. Legally, when it is difficult access to public information, this undermines fundamental legal rights and individuals' ability to participate in public policy debates. Besides, the aspects of database protection in law varies depending on the purpose of the governmental policy.

This dissertation also discussed several rules and actual examples of using public data in legal affairs. Public data can be used more widely, particularly considering its considerable growth in various fields.

However, new attempts to utilize public data are still ambiguous for its characters in terms of legal fields that are suggesting an ideal model to improve accountancy and transparency. Nevertheless, despite these limitations, some constructive suggestions will be made.

First, a small-sized and direct participative data pool is beneficial in terms of helping to build a larger data pool. Ostrom found in her research that many sustainable common resource organizations are small and serve local communities.[495] These communities were a direct party to limited resources and so participated actively to overcome the challenge of understanding and conceding each viewpoint. They could understand different viewpoints based on similar cultural backgrounds and discuss the worst-case scenarios when they failed to settle. For example, a foremost critic from a national data publication noted that a certain dataset was not useful because it was too general and broad to satisfy the demands of users.[496] On the other hand, the MPEG platform could harmonize different viewpoints since the pool pursuits only to share a standard patent of video with reasonable transaction costs. In this regard, we can infer that the small-sized pool participating direct parties seem beneficial to maintaining a sustainable model.

Also, neutral institutions perform an essential role in maintaining a pool. The early stage of patent pools show that the pool users might abuse their authority by controlling market price rather than fostering a pro-competitive market with social benefits. In other words, such individuals used the pool system to build a cartel or trust with those who are in related fields of business. Consequently, it is difficult to innovate a given technology behind IP protection.

According to the MPEG case, Columbia University participated in the patent pool as a founding member, and it mediated each party's demands in an objective way.[497] The participation of a non-profit research organization helped persuade DOJ that the purpose of the pool was to exchange

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[495] *See* OSTROM *supra* note 10.

[496] Supra Ch.4

[497] *Id*.

valuable patents with lower costs for each party rather than abusing market control.[498] The neutral party enhanced the pool's transparency to prevent collusion, which can be a chronic problem in the system.

Third, the advantages of sharing public data are making various synergy impacts. The collaboration between a racing company and hospital for predicting pediatric heart attacks is not a unique case of an institution from one field adapting the data process of another to improve forecasting.[499]

The potential usage of data is unpredictable when the information is available for various non-profit and corporate areas. However, most useful data is possessed by a few giant IT companies as a kind of private assets. In this regard, OGD increases the economic and/or social value of data as people creatively interpret and apply it.. Given bureaucratic inefficiency, some public- and private sector cooperation around data usage ,might help ,meet important social needs. Governments would take the role of a significant data provider and monitor the party to develop a transparent data industry.

The reason why sharing economy receives attention is that it seems efficient and economical. Also, the current sharing economy model proposes a solution for the adverse effect of overconsumption and the deterioration of natural resources. For example, Americans own more than two vehicles per household on average, also more than 35% of households have three or more

[498] DOJ *supra* note 303.

[499] Supra Ch. 2

cars.[500] Unfortunately, these cars are parked 95% of the time in the garage.[501] In other words, people in the U.S. are spending a colossal amount of money for only 5% of the utility of the product. The sharing economy like Uber and Airbnb has mitigated the inefficiency of the current problem and is related to conserving natural resources in the long-term by reducing overproduction.

The concept of the sharing economy can also be applied to knowledge or intellectual property. Since Heller pointed to the problem of the anti-commons in the pharmaceutical industry, many scholars have worried about the abuse of IP possession.[502] They have expressed concern that current IP protection might reduce competition in the market and slow down the speed of innovation because of the high transaction cost of technology and the threats of lawsuits. A few giant IT companies reserved enough database for running their own service. Therefore, voluntary open data pools are essential to stimulate innovation and to sustain a pro-competitive market.

Finally, an effort for a unified definition of legal concepts of the data industry is essential. WIPO and state leaders need to discuss this subject more seriously. They might reconsider the nature of the database, which failed in 1996.[503] The differences in database protection between the U.S. and EU also generates enormous costs.

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[500] Moina Noor, *Many Families Limiting Themselves to a Single Car,* NEW YORK TIMES July 27, 2008 *available at* https://www.nytimes.com/2008/07/27/nyregion/nyregionspecial2/27Ronecar.html)

[501] David Z. Morris, *Today's Cars Are Parked 95% of the Time*, FORTUNE, March 13, 2016 https://fortune.com/2016/03/13/cars-parked-95-percent-of-time/.

[502] Heller *supra* note 7; Shapiro *supra* note 27.

[503] *See in general* Samuel E. Trosow, *Sui Generis Database Legislation: A Critical Analysis*, 7 Yale J.L. & Tech. 534 (2015) (After fail to consent database right in WIPO, the U.S. legislator tried to adopt sui generis protection, however, it is still difficult).

The development of information technology and IP law has made many types of resources easier to access. Many attempts have been undertaken to digitalize, archive, and present information in ways that facilitate access to these resources. Such ways face faces trouble in terms of sustainability problems, especially this dissertation approached anti-commons issue. OGD is anticipated movement to create and maintain a data pool for reusing public data to the private sectors without additional cost and to reduce the total transaction cost in the data industry. Fortunately, pooling seems an increasingly common strategy in economics and the patent system, and these efforts would reduce initial errors.

As discussed in previous chapters, the sustainability of database pools is an essential requirement for the full utilization of data collected by the public sector. As suggested by several attempts in OGD and other legal approaches, independent or biased subjects failed to gather participants from other parties, and it decreased markedly efficiency in long-term sustainability of the knowledge commons. Working with other parties on the central issues of long-term sustainability is necessary to enhance big data innovation and overcome the crisis of the anti-commons. The giant's shoulders must be open to everyone to stand on.

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