Big Data Database
Loopholes Regarding Ownership and Access to Data

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Abstract

Big Data is an interesting, developing and to some extent, vague area in respect of law. The actual value of Big Data is in its flow, not its sources. There are different options discussed which are considered as the tool to dictate ownership for Big Data, like, Copyright, Trade Secrets, Patent, Database Protection etc. However, there are also some ideas to come up with a new type of intellectual property right to deal with this. Among other available intellectual property rights, database, apparently, provides the most obvious protection for Big Data. In addition to it, laws regarding Big Data needs to be in conformity with privacy law, competition law, contract law etc.

The research primarily concerns with big data database, and to identify the impact of big data, it includes some aspects of business practice. From a broader perspective, the research analyses the scope of third parties’ rights to match with the financial aspects of big data database. This research aims to identify how to balance different interests in using big data. There is no point to deny the need to control big data and simultaneously, privacy should be respected as well. It is therefore important who can access to these data and how far their right to access can be stretched. This access right extended to third parties is valuable as it is a must to ensure free flow of data which is a prerequisite for building the new data economy. In regard to methodology, the thesis is based on analytical approach where existing sources are being explained in the context of recent scenario.
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Nusrat Jahan Shaba
**List of Abbreviations**


**TFEU**  Treaty on European Union and the Treaty on the Functioning of the European Union 2012/C 326/01

**EU**  European Union

**EC**  European Commission

**IoT**  Internet of Things

**UK**  United Kingdom

**DSM**  Digital Single Market

**DG CONNECT**  Directorate-General for Communications Networks, Content and Technology

**NoSQL**  Non-Structural Query Language

**DBMS**  Database Management Systems

**RDBMS**  Relational Database Management Systems

**OECD**  The Organisation for Economic Co-operation and Development
List of Cases

Apis-Hristovich EOOD v Lakorda AD C-545/07

Directmedia Publishing GmbH v Albert-Ludwigs-Universität Freiburg C-304/07

Fixtures Marketing Ltd v OPAP C-444/02

Fixtures Marketing Ltd v Oy Veikkaus AB C-46/02

Fixtures Marketing Ltd v Svenska Spel AB C-338/02

Football Association Premier League and Others C-403/08 and C-429/08

Football Dataco Ltd. v Yahoo! UK Ltd C-604/10

IMS Health GmbH & Co. OHG v NDC Health GmbH & Co. KG C-418/01

Innoweb BV v Wegener ICT Media BV and Wegener Mediaventions BV C-202/12

Microsoft v Commission T-201/04

RTE and ITV v Commission C-241/91 P and C-242/91 P

Ryanair v PR Aviation BV C-30/14
List of Statutes

Treaty on European Union and the Treaty on the Functioning of the European Union (TFEU) 2012/C 326/01


1.1. Background

Big data involves enormous amount of data. For recent data-driven newer forms of services and applications, this gigantic amount of data serves as the most valuable input and also, it can be used in public interest like, maintaining smart cities, resource-efficient farming etc.¹

European commission is currently approaching for the establishment of a digital single market\textsuperscript{2} and as a part of this project, launched ‘free flow of data’ initiative.\textsuperscript{3} This initiative emphasises on the mobility of data, ensuring accessibility of it. As a part of its priority project, European union is approaching for a new regulation for data economy which concerns both ownership of data and access to data whereas, the ultimate goal is to ‘build a data economy’ which will ‘maximize the growth potential of the digital economy’.\textsuperscript{4}

Intellectual property law is positioned, by nature, at the forefront of new technical and economic developments in society. Ownership and control of new commercial opportunities are being determined in the law. Presently society is trying to come to grips with the effects of an unprecedented increase in the availability and usefulness of data. This is often discussed under the heading of big data. A large portion of the data is personal but increasingly, industrial data is booming by the prevalence of connected sensors in an increasing number of products. This project aims to relate the on-going industrial and economic development to European intellectual property law. Some of the issues that will be covered in this paper are what


intellectual property right are suitable for managing Big Data Database. Whether it is possible to maintain big data under the existing law or if it requires some new rights? An equally important aspect is if data under the control of some company should be made available to other companies under some compulsory regime to ensure free flow of data. Data access rights need to have some specific set of rules and it is nowadays a compulsory option to decide as to who is entitled to claim access and to what extent the data producer’s right is extended to grant third parties to get access over data.

Data is nowadays considered as the ‘oil’ of the new economy. big data ownership is an interesting, developing and to some extent, vague area of law. However, there are a number of challenges related to ownership of big data. The actual value of data is in its flow, not its sources. As a result, the question of “ownership” of data is probably not the proper question to ask. It does not matter who “owns” the data, but who can use them, access it, and for what purposes. And, as the number of sources and the amount of data grows, it is the potential of recombining those aspects, that will lead to exponential progress in how we use and approach data.

Practically, ownership of data needs to be analysed from a different angle; involving the business aspects of data. Businesses are not only interested in acquiring ownership of data, but rather how they can control the use of such data is their biggest concern. Often, corporations seem to prefer contracts. The industry is quite unwilling to introduce a new intellectual property right for determining ownership of big data. Some of the reasons includes,

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6 Ibid.
a) The firms are not sure whether the new right will bring benefits or curtail existing rights.

b) There is no clear indication as to who will hold the ownership and such allocation of ownership is a major issue.

c) Nowadays, practicing contract law to deal with big data allows huge scope as contract law provides wider range to the corporations handling those data.

Big data ownership yet need to be settled and there are different suggestions available as to what is best suited. While coming up with a guideline to designate ownership to big data, it needs to be taken care of that free flow of data should be encouraged as it forms the core towards building a data economy.

To decide ownership of big data is not as simple as it may seem. There are certain blocks which need to be removed first. There are different options discussed which are considered as the tool to dictate ownership for big data, like, copyright, trade secrets, patent, database protection etc. However, all of them have their flaws and there are also some ideas to come up with a new type of intellectual property right to deal with this. Moreover, however the ownership is decided, it needs to be in conformity with privacy law, competition law, contract law etc.

1.2. Motivation

New big data technologies are entering the market, while use of some older technologies continues to grow. In the early days of big data analytics, organizations were looking back at their data to see what happened and then later they started using their analytics tools to investigate why those things happened. Predictive analytics goes one step further, using
the big data analysis to predict what will happen in the future. In edge computing, the big data analysis happens very close to the IoT devices and sensors instead of in a data centre or the cloud. For it workers, the increase in big data analytics will likely mean high demand and high salaries for those with big data skills. As the cost of hiring big experts rises, many organizations are likely to be looking for tools that allow regular business professionals to meet their own big data analytics needs.\(^7\)

While it’s clear that the big data market will grow, how organizations will be using their big data is a little less clear. Therefore, it is high time to figure out what the rules will be to monitor this gigantic data economy. The demand is in its pick to identify a solution to an ongoing social development. Big data, itself has great potential for the future of business. Already, we can feel how influential impact it is making in practice. There must need to be a concrete set of rules to balance different interests in using big data.

As an emerging giant, big data needs to be controlled and simultaneously, privacy should be respected as well. It is therefore important who can access to these data and how far their right to access can be stretched. This access right extended to third parties is valuable as it is a must to ensure free flow of data which is a prerequisite for building the new data economy.

1.3. Literature Review

The concern with big data is global nowadays. As the topic is attracting audience very recently, there are not too many works detailing every aspect of big data, especially, the ownership concern. Europe is actually showing great concern to it as it has been seen in EU report on ‘legal study on ownership and access to data’. The project aims to work on this issue and prioritized it as important to ensure free flow of data in Europe.

Josef Drexl’s work is inspiring as it shows how privacy can be affected. There are other works presenting trade secret as the best option for managing big data. The existing literature shows how important the ownership issue is, in relation to big data, however, there is no concrete and in-depth analysis on what tends to be the possible solution for it. This project aims to identify such solution. Needs to be developed further. In relation to regulations, the very new form of data protection law, TFEU, database directive, laws on trade secrets.

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11 Treaty on European Union and the Treaty on the Functioning of the European Union 2012/C 326/01


table work of EU on preparing new rules concerning data economy etc. had been the key basis for this research.

1.4. Objectives of the Research

The research is primarily concerned with big data database, and to identify the impact of big data, it includes some aspects of business practice. From a broader perspective, the research will analyse the scope of third parties’ rights to match with the financial aspects of big data database.

This research focuses on identifying solution to an on-going social development. Big data, itself has great potential for the future of business. Already, we can feel how influential impact it is making in practice. This research aims to identify how to balance different interests in using big data.

As an emerging giant, big data needs to be controlled and simultaneously, privacy should be respected as well. It is therefore important who can access to these data and how far their right to access can be stretched. This access right extended to third parties is valuable as it is a must to ensure free flow of data which is a prerequisite for building the new data economy. This research focuses on identifying how to create this balance.

The research will broadly focus on ownership and access to industrial data and the endeavours to develop an appropriate legal framework. In what ways ownership can best ensure the smooth expansion of data economy and what will the best suitable answer that is capable to survive the functional market.
Comparing the existing intellectual property strategy and analysing them with the scenario of big data will be the primary focus of the research. As this is a growing concern all over the world, especially within European union, the research will particularly look for legislation within EU.

The project further aimed to identify if there is any demand for a new kind of intellectual property rights and what should be the nature of such new kind. The project will clarify what this new type of intellectual property right entitles, who does it confer the right to, to what extend the right entitles the right-holder and other details. Another aspect, which is equally important for this project to identify rules regarding access to data by third parties to ensure free flow of data.

1.5. Research questions

My preliminary research question is control and access to big data database?

From this, the following sub-research questions can be identified:

i. Do the existing intellectual property rights cover ownership over big data? If so, is it possible to maintain big data under existing laws on intellectual property rights or does it require some modification?

ii. Whether database rights are the most suitable option for controlling big data? What are the drawbacks of existing database laws in this regard?

iii. If big data requires any new kind of intellectual property right to continue its flow in practice? What should be the characteristics of this new kind?
iv. How does big data affect third parties’ possibilities to develop new services? If competitors willing to develop new services needs free flow of data, how should such access to data be guaranteed?

1.6. Methodology

This project will use analytical approach to identify which intellectual property rights suit big data the most. This will involve analysis of the major EU instruments relating to these areas of law and other relevant sources, such as the approach of European union.

The methodology will include relevant case-laws as there are currently some disputes going on. Furthermore, data from scholarly articles and other secondary sources would be helpful as well.

The research is entirely based on analysis on existing data, mostly secondary data sources but the core focus is based on primary data sources like legislations. However, the core of the research is European commission’s on-going developments on data economy.
Chapter II: Big Data Database

2.1. Introduction

2.2. Internet of Things (IoT)

2.3. Big Data

2.4. Main Features of Big Data

2.5. Big Data Database

2.5.1. Benefits of Big Data Database

2.5.2. NoSQL Database

2.6. Laws Relating to Database in General

2.7. Sui Generis Right

2.1. Introduction

Big Data is the current buzzword, which, as a concept is still elusive. For example, Facebook collects data of users shopping habits. This can be of interest to the giant online markets like Alibaba, Amazon, e-bay etc., on the contrary, it can of interest to the researchers who are working on shopping habits. There can be a lot of other uses of such data initially collected by Facebook which cannot even be predicted while they were being collected.

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In order to understand the real picture, we must go through the background of data first. Today, it is the most important asset of the data economy. However, initially, during web 1.0 version, internet was used as a tool for providing information and at that time, state just perceived the need of new legislation for the then revolutionary internet services.\(^5\) Then in web 2.0 version, the business expanded where search engines and social platforms were sponsored mostly by advertising.\(^6\) In course of time, there comes the era of Internet of Things.

### 2.2. Internet of Things (IoT)

IoT is the existing technology trend which is aiming for expansion to every aspects of human life. Physical objects get connected with each other and with the environment in IoT boosting the demand of data.\(^7\) In this stage, data collected by any entity for any particular reason can be of great interest for other entities for some other reason or reasons which can even be totally different than the initial collector.\(^8\) There will be innovative smart products and services which will increasingly replace existing ones and those products will collect data by sensors. These data are going to be of great use to different sectors both in private and public arena.\(^9\)


\(^6\) Ibid.

\(^7\) Ibid. p. 10.

\(^8\) Ibid.

\(^9\) Ibid. p. 11.
2.3. Big Data

Although Big Data in many ways is very contemporary, the concept can be traced back a long time.\textsuperscript{20} It is quite tough to determine the exact point or time from when big data started to pose new questions. However, it is assumed that the digital world is expanding at a rate of 1 Exabyte per day and we, the whole world, may it be directly or in an indirect way, are contributing to this expansion.\textsuperscript{21} Big Data is not an isolated phenomenon, rather an integrated part of technology which is already changing the way businesses operate.\textsuperscript{22}

Data and information are not traditional commodities, therefore, it is hard to determine the value of data.\textsuperscript{23} It is often termed as ‘non-rivalrous’ good as it can be used over and over again and use by one does not hinder others.\textsuperscript{24} The value of data is not only limited to its primary uses, rather it can stretched to all the secondary uses as well, however, some data might also lose its utility over time.\textsuperscript{25}

To simply say, Big data is the collection or database of information which is getting wider and wider every day. This ‘information’ includes any data that has been being transferred or exchanged through or uploaded online or with any electronic devices. It can either be


\textsuperscript{22} MARR, B. 2015, \textit{A Brief History Of Big Data Everyone Should Read}, accessed from \url{https://www.weforum.org/agenda/2015/02/a-brief-history-of-big-data-everyone-should-read/} on 13 February 2018.


\textsuperscript{24} Ibid.

\textsuperscript{25} Ibid. p. 135.
personal information or professional, statistical data or analytical, structured or unstructured. The volume, velocity, and variety of Big Data are greatly high.\textsuperscript{26}

Big Data is always connected to large volume, however, there is no specific measurement which can provide some clear indications as to what volume is considered large.\textsuperscript{27} Messiness refers errors in data, which is undesirable for traditional analysts.\textsuperscript{28} However, Big Data analysts find additional uses for data with errors, turning it into a virtue.\textsuperscript{29} For Example, Google takes the advantage of queries with errors to better its spellchecker.\textsuperscript{30}

Big Data is not a single technology or discrete idea, rather, it depends on several realms of business and technology. Big Data refer to large and complex data sets that are impractical to approach with conventional software tools.\textsuperscript{31}

Big Data seized a lot of attention from market trends, equipment-based performance, and other industry elements. One of the great potentials of Big Data is the ability to restructure data from different sources, compare and analyse them. This allows finding new correlations;

\begin{itemize}
\item \textsuperscript{26} NORWEGIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY. What is Big Data? Accessed from \url{https://www.ntnu.edu/ie/bigdata/what-is} on 10 June 2018.
\item \textsuperscript{28} Ibid.
\item \textsuperscript{29} Ibid.
\item \textsuperscript{30} Ibid.
\end{itemize}
something that will help us understand how society works, and how one phenomenon works on another.\textsuperscript{32}

In attempt to clarify Big Data, one needs to understand the value of data-driven approaches, preserving data those are not used, impact of messy data, unlimited scope for analysing data which may currently seem unimportant and dark sides of datafication.\textsuperscript{33}

Big Data, often represents real world phenomena through proxies, instead of describing the phenomena directly and these proxies are important when real world objects cannot be measured directly.\textsuperscript{34} For example, Target corporation received help through proxies to detect its customers’ pregnancies long before they start making decisions about purchasing for babies.\textsuperscript{35}

Big Data is showing us the power of data and how the world would change if we could analyse the earlier unused data.\textsuperscript{36} The evolution of Big Data is not free from black spots and there are incidents where Big Data failed to proper representation. For example, during Vietnam war, progress was measured by mortality rates which indicates a misuse and abuse of data and this failure could have been avoided by relying on multiple sources of data and human agency.\textsuperscript{37}


\textsuperscript{34} Ibid. p. 133.

\textsuperscript{35} Ibid.

\textsuperscript{36} Ibid.

\textsuperscript{37} Ibid. p. 134.
The biggest concern about Big Data is its ineffectiveness in protecting privacy. Nowadays, getting consents from the individuals before data collection is not enough as there is no boundary as to foresee the potential secondary uses.

2.4. Main Features of Big Data

The three main characteristics of big data is widely accepted, and in addition to these three main features, there are some other points too. These features are discussed briefly in the following:

- Volume: Big data is, as it is called, big in volume. It is commonly measured in petabytes, exabytes, and even zettabytes. To simply explain, regular computers are not enough to work with big data. For example, one Google search engine uses the computing power of the Apollo space mission.

- Variety: In the past, data was usually structured to fit the rigid data model of relational database management system. With the rise of big data, unstructured data, for example, including everything from social media posts, images, and video to time-series IoT data is growing far more rapidly than structured data.

- Velocity: Big data requires speed at an extra-ordinary pace. For example, Twitter Firehose works at 6,000 tweets per second. Speed is critical in the big data era. Massive

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volumes of heterogeneous data are being created in real time, and the expectation is that they can be ingested, stored, and processed in near-real time which is particularly important with information such as time-series IoT data.\textsuperscript{41}

- Veracity: Veracity points out the reliability of data. In other words, it can be described as confidence or trust in the data. Knowledge of the data’s veracity helps to understand the risks associated with the information.\textsuperscript{42}

- Variability, Validity, Vulnerability, Volatility, Visualization, Value etc. are some other features which can be attributed to big data.\textsuperscript{43}

### 2.5. Big Data Database

Data can be many things to many people. We now live in a world in which more data is being generated and captured than ever before and with the growth of the Internet of Things (IoT).\textsuperscript{44} Database is an accumulation of free information, orchestrated in a deliberate or efficient manner by which bits of information are exclusively available. The information must need to be gathered in an organized method to take into consideration recovery of particular information focuses. There has been generous interest in the getting, confirmation or introduction of the information. Big Data cannot be captured, stored, managed, and analysed

\textsuperscript{41} Ibid.


\textsuperscript{43} Ibid.

using usual data processing tools like traditional database management systems (DBMS), in particular the relational ones (RDBMS).  

Consequently, technological development has led to new database architectures and new database technologies. The traditional database system does not fit with the gigantic tasks of big data. The standard database management system that has been in use for the past 30 years, is no longer capable of handling big data requirements, resulting in emergence of newer big data databases. These databases can of various types, having difference in their operations, such as NoSQL database.

Top databases providers offer rearchitected database technologies combining row data stores with columnar in-memory compression enabling processing large data sets and analytical querying, often over massive, continuous data streams.

2.5.1. Benefits of Big Data Database

Databases eliminate the prohibitive complexity, disruption, and cost associated with scaling traditional RDBMS. Cost-efficiency and flexibility are some of the other advantages of big data database. When compute resources are added to a database, performance increases in a proportional manner so that corporations can continue to deliver a reliably fast user

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experience. High availability, reducing time, product development, understanding the market, saving costs are further benefits of big data database.

2.5.2. NoSQL Database

Studying on technological details, there are many features of traditional RDBMS technology are lost in context of storage and processing Big Data with NoSQL databases. NoSQL databases use very different database technologies and have, consequently, very different uses. Concerning NoSQL databases, they provide different mechanisms to store and retrieve data, which directly affects performance in a positive way. MongoDB, OrientDB, CouchDB are some of the examples of such databases.48

A complex Big Data processing requires integrating more database technologies into more complex software stacks. These DBMSs are capable to quickly proceed large amounts of mainly structured data with minimal data modelling required and can scale-out to accommodate multiple terabytes and sometimes petabytes of data. For example, in Vertica Analytic Database14 this is supported by columnar architecture and advanced data compression capabilities.49

48 Ibid. p. 3.
49 Ibid. p. 9.
2.6. Laws Relating to Database in General

Laws relating to database is comparatively in advanced level than in other parts of the world. The existence of database rights does not hold back EU businesses from developing innovative new uses for data, however, there are some contradicting views. For example, a report in 2015 indicates the database directive as an impediment to the development of a European data-driven economy.\(^{50}\)

In 2012 the High Court ruled that the investment put in to recording a collection of "factual data" about football matches qualifies for database rights protection, although it also ruled that that protection does not apply to the recording of goal information in a database on its own.\(^{51}\)

The Database Directive was established as a way of harmonising the law protecting databases so as to encourage the development of database-dependent businesses in the digital age by creating a 'sui generis' database right that can protect certain sets of data that cannot qualify for copyright protection. Had the court ruled that database rights existed in Ryanair's data then PR Aviation\(^{52}\) would have been able to take and use the data under a permitted use exception provided by the Database Directive which Ryanair could not have excluded through

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\(^{50}\) CONNOR, I. 2016. Database Rights are no ‘Impediment’ to Europe’s Data-Driven Economy. The Register. Accessed from https://www.theregister.co.uk/2016/01/14/database_rights_are_no_impediment_to_the_growth_of_europes_datadriven_economy_expert_says/ on June 02, 2018.


\(^{52}\) C-30/14 Ryanair v PR Aviation BV as cited in Connor, I. 2016. Database Rights are no ‘Impediment’ to Europe’s Data-Driven Economy. The Register. Accessed from https://www.theregister.co.uk/2016/01/14/database_rights_are_no_impediment_to_the_growth_of_europes_datadriven_economy_expert_says/ on June 02, 2018.
its website terms and conditions. The rulings in these cases show that at a basic level database rights are not an impediment which prevents people using information because, in many cases, database rights simply will not subsist in sets of data.

EU database rights laws contain a number of exceptions which mean that, even where copyright or database rights is said to subsist in data sets, they do not serve as an unjustified barrier to the development of big data projects. Under the Database Directive where databases are protected by copyright, database owners cannot prevent a lawful user of that database from making a copy of the database where it is necessary for the lawful user to do so to access the database contents. Lawful users of the database, however, are prohibited from using publicly available databases in ways "which conflict with normal exploitation of the database or unreasonably prejudice the legitimate interests of the maker of the database" or from causing "prejudice to the holder of a copyright or related right in respect of the works or subject matter contained in the database". 53

2.7. Sui Generis Right

Even more surprisingly, the riddle of database protection seems to be even more darker for common law jurisdictions, and we refer mostly to the UK, where the protection of a database from copyright law appeared to be an acquis.

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In this context, it seriously restricted the scope of the sui generis protection in 2004 when admitting that the investments in the creation of the database's contents cannot count as investment for the obtaining of the contents for the purposes of the award of database sui generis right in a series of sport's database cases.\textsuperscript{54}

The 2009's Apis\textsuperscript{55} decision clarified the concept of a "temporary transfer" of the database's contents and redefined the concept of the "substantial part" from a quantitative point of view in a way that covers modules of databases if the modules themselves do not constitute a database, but also qualitatively by confirming that sui generis protection of a database's substantial part may cover the investment in obtaining the data even if the data come from the public domain.

After the ruling in the sport's database cases in 2004, the organizers of professional football matches in England and Scotland sought to prevent the use of their football fixture lists by companies which provide information and/or organize betting activities on the basis of copyright law, since it was far from clear that their investment in the production of the lists could be taken into account for the award of sui generis protection.\textsuperscript{56}


In other words, there is a database for the purposes of the Directive if the data which are included in the database have already been created since the objective of the Directive is to encourage the creation of systems for collecting and consulting information and not the creation of data. In fact, the axiom of the complete independence of copyright and sui generis protection is certainly valid if the basis for the award of copyright protection is the original arrangement of the database’s contents. In that case, copyright protection results to cover not only the thematic structure of the database but also the specific contents which correspond to the criteria of selection and are finally entered in the database. Therefore, database contents can be protected at the same time by the sui generis right as a whole or as a substantial part of the database and by database copyright on the basis of their original selection in the context of the database.\textsuperscript{57}

Nonetheless, original selection or arrangement of data is a key element for the award of database copyright and not for the award of copyright over the contents themselves, even if the informative value of the latter is augmented indirectly due to their inclusion to the database. For database copyright, it is irrelevant if the original selection and arrangement took place for the production of a specific content, since it is aimed to protect the selection or/and the structure of the list of contents and not the creation of contents themselves, in our case the fixation of the date of a match.\textsuperscript{58}

\textsuperscript{57} Ibid.

\textsuperscript{58} Ibid.
Chapter III: Ownership Issues

3.1. Data Ownership

Assigning ownership towards big data is critical as the definition of individual data is itself vague. Furthermore, big data indicates gigantic datasets and therefore, requires special protection as the data is being processed continuously.

There are different aspects from which data can be perceived. Protection of data can be both from syntactic level and semantic level.\(^{59}\) Syntactic level will focus on the elements that

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has been portrayed, however, semantic level regards to the meaning of such representation. For example, X sends a message to Y which is written in English. The letters used in the message are enough to understand the data from syntactic level, however, to understand the meaning of such message, one needs to perceive it from a semantic level. If Y does not know reading in English, then the message will be available to Y only in syntactic level.

Before assigning ownership to data, first, it needs to be decided what actually will be owned by such right. Whether the law should protect syntactic level or semantic level of data, depends on the circumstances which will lead to another issue as to whether it is possible to come up with such regulation that fits to the general regime on the protection of industrial data.60

Why ownership is required in respect of big data is a debatable issue. There are controversies as to how data needs to be protected and whether it will encourage free flow of data. For example, X is manufacturing a smart car which, through its sensors can identify some anomalies in the engine function. These irregularities may have been unnoticed by any natural person. These data can be stored in the digital server of X. If ownership is allocated to X for such data then X can exclude other manufacturers from getting such data. This has a great effect in relation to competition in business. Furthermore, there may be companies for engine lubricants who are very much interested in these datasets and may come up with an effective solution to the problem. Here, X can limit access to specific company which they are doing business, denying access to all others. This definitely hampers free flow of data. Again, public sectors might be in need of these data for different welfare reasons and X here, can also deny access to them as well. Here, the main question is whether allocating ownership will ensure

60 ibid. p.13.
free flow of data or it will create an embargo. On the contrary, if there is no right assigned for collecting such datasets, what will motivate the investors to make investments for such whereas, every other entity will take the benefit out of it.

Big Data ownership is an interesting, developing and to some extent, vague area of law. However, there are a number of challenges related to ownership of Big Data. The actual value of data is in its flow, not its sources. As a result, the question of “ownership” of data is probably not the proper question to ask. It does not matter who “owns” the data, but who can use them, access it, and for what purposes. And, as the number of sources and the amount of data grows, it is the potential of recombining those aspects, that will lead to exponential progress in how we use and approach data.

3.2. Ownership Crisis

Practically, ownership of data needs to be analysed from a different angle; involving the business aspects of data. Businesses are not only interested in acquiring ownership of data, but rather how they can control the use of such data is their biggest concern.\textsuperscript{61} Often, corporations seem to prefer contracts. The industry is quite unwilling to introduce a new intellectual property right for determining ownership of Big Data. Some of the reasons includes,

a) The firms are not sure whether the new right will bring benefits or curtail existing rights.

b) There is no clear indication as to who will hold the ownership and such allocation of ownership is a major issue.

c) Nowadays, practicing contract law to deal with big data allows huge scope as contract law provides wider range to the corporations handling those data.

Big Data ownership yet need to be settled and there are different suggestions available as to what is best suited. While coming up with a guideline to designate ownership to Big Data, it needs to be taken care of that free flow of data should be encouraged as it forms the core towards building a Data Economy.

To decide Ownership of big data is not as simple as it may seem. There are certain blocks which need to be removed first. There are different options discussed which are considered as the tool to dictate ownership for Big Data, like, Copyright, Trade Secrets, Patent, Database Protection etc. However, all of them have their flaws and there are also some ideas to come up with a new type of intellectual property right to deal with this. Moreover, however the ownership is decided, it needs to be in conformity with privacy law, competition law, contract law etc.
3.2.1. Big Data Protected as Database

Among other available intellectual property rights, database, apparently, provides the most obvious protection for Big Data. The Database Directive provides protection for a two-tier system; one is copyright protection for creative databases and the other is sui generis protection for substantial investment on databases. In the case of Football Dataco v Yahoo! UK, protection for creative databases is available if its author expresses his creative ability in an original manner by making free and creative choices through the selection or arrangement of the data it contains which indicates the individual data is not entitled to protection under this protection further explicitly mentioned in article 3(2) of the Database Directive.

Even if data is not protected, Database enjoys some exclusive protection like the sui generis right in European Union. However, these Database rights do not protect the actual data, they protect the way in which data are organized or represented. Although, sui generis database protection may seem the perfect fit for protecting data in the world of IoT, it certainly has its

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64 ibid. Article 3.

65 ibid. Article 7(1).


limitations in regard of subject-matter of protection and the scope of protection.\textsuperscript{68} Article 1(2) of the Database Directive\textsuperscript{69} defines database as a collection of independent works, data or other materials arranged in a systematic or methodical way and individually accessible by electronic or other means meaning collection of digital data can be considered as databases.\textsuperscript{70} In the case of British Horseracing Board,\textsuperscript{71} the CJEU interpreted the requirements for \textit{sui generis} database protection in a rigid way explaining the aim of the Directive is to create incentives for the making of database, not for the creation of the data contained in it.

In regard of extraction and reutilization, the existing laws on database protection fails to cover the reality of big data by limiting its scope of protection. The owner of the database right is granted the right to object to the extraction or reutilization of the contents of the database, both for the whole database and any substantial part of it indicating the right covers the use of the contents of the database.\textsuperscript{72} This includes taking out of a substantial part of the contents of the database and its reorganization by computer as a prima facie incident of


infringement. According to CJEU, the prohibition contained in article 7(5) of the Directive\textsuperscript{73} refers to unauthorised acts of extraction or reutilization of the whole or substantial part of the contents of the database, in the absence of any prior authorization by the maker of the database.\textsuperscript{74} In later years, CJEU followed this standpoint in \textit{Apis-Hristovich EOOD v Lakorga}\textsuperscript{75} and in \textit{Directmedia Publishing GmbH v Albert-Ludwigs-Universität Freiburg}\textsuperscript{76}. In \textit{Innoweb BV v Wegener ICT Media and another},\textsuperscript{77} it was amounted as an act of reutilization where a meta-search engine was made available to allow users to search multiple databases through a single gateway, making the entire concept of reutilization mentioned in article 7 relatively broad.\textsuperscript{78}

Big Data may seem appropriate to get protection under database rights, although there are basic loopholes in it. The existing database rights protect the database as a whole, not every single data in it.\textsuperscript{79} This protection is to give incentive to the investor who put labour, money in compiling these data. Big Data, on the other hand, requires a large amount of investment, but the uniqueness lies in its processing capacity. And, the data keeps changing depending on what

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{73} \textsc{database directive}. EU Directive No. 96/9/EC of the European Parliament and of the Council, of 11 March 1996 on the Legal Protection of Databases
\end{itemize}
\end{footnotesize}
is required, therefore, the individual data cannot get protection under the existing law on database protection. Although the existing scenario of Big Data economy is relatively closer to the database protection, however, there is no way to deny the fact that the current legal frame is not technologically appropriate for the modern data industry.

3.2.2. Big Data as Patents

Business with Big Data, according to some can be regulated under patent law, meaning Data can be registered as patents which will entitle the patentee to have exclusive right over it for a limited period.

Patent is monopolistic right provided to the right holder, granted for inventing something new, non-obvious technical invention which does have some industrial applicability. This exclusive right can be achieved when the patent office will find the product innovative and absence of some product in the prior art. This brings the most important question, how data will pass the novelty test as most of the data are freely accessible. Also, once patent is granted, the information becomes public and then everyone can get access to individual data which are not protected. This will affect both the scope of patents, the rate of success or failure of patent applications, both of which will have a significant impact on the return on investment in patent exclusive rights being sought and used by a business and its investors.

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There are cases where patent protection extends to products obtained through process and this brings a new issue as to whether data can be considered as a product that can be patented as a process patent.\(^{81}\) Process patents are much weaker than product patents as the owner of a product patent enjoys wider protection also, it is not effective to extend patent protection to information as the product of a process patent.\(^{82}\) There exists examples already where the German Court denied protection for information that is derived from a process patent as the Court finds information is directly accessible for humans without any further technical process, therefore, lacks technicality and cannot be patented.\(^{83}\)

Overall, patent law in practice will turn the entire industry evolving around Big Data into a static level\(^{84}\) which is completely the opposite to what Data actually does. Opposition regarding invalidity of patents will lead it to nowhere as the data is constantly changing and rearranging according to the demand. Therefore, following the patent system without further analysing it will be a troublesome issue in future.

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\(^{82}\) Ibid.


3.2.3. Big Data as Copyright Protected

Copyright is an option for Big Data as it is automatic in the sense that no registration is necessary. However, copyright is mainly concern with creative content. Software code can also be copyright protected. Data within the periphery of Big Data can hardly be considered as creative, it is the processing of such data that made them profitable for the business.

Copyright does not require any registration process and therefore, anyone can claim it.\textsuperscript{85} However, to control copyright infringement is not an easy thing to do and copyright provides such protection which is comparatively low than other Intellectual Property rights. Another delimitation with this copyright protection is Big Data requires higher level of protection whereas, copyright infringement is very hard to control. Furthermore, database is linked with copyright and therefore, the entire aspect can be covered considering protection of big data as database.

3.2.4. Big Data Protected as Trade Secret

A trade secret can be any data that is not commonly known to others, that gives the owner a competitive advantage and that is properly protected under trade secret rules. Data is often a trade secret, so is Big Data.

To protect the trade secrets in Big Data, the value of the trade secret will likely lie in the potential for re-use and the recombination of the particular data that forms the Big Data.

\textsuperscript{85} JUX LAW FIRM. 2017. Does a Copyright Have to be Registered to be Valid? Accessed from https://jux.law/does-a-copyright-have-to-be-registered-to-be-valid/ on 17 February 2018.
flow.\textsuperscript{86} Affirmative and documented processes for keeping the Big Data proactively protected from disclosure will define the trade secret status.\textsuperscript{87} In case of protecting specific information, trade secrets protection definitely sounds more appropriate than database protection, however, trade secrets protection is defined by article 2(1) of the Directive\textsuperscript{88} in such a restrictive manner which does not fully adhere to the context of data produced by sensors attached to smart products.\textsuperscript{89}

An effective trade secret program is dynamic and will impose strong confidentiality on the Big Data and the processes that allow that Big Data to effectively and regularly block access by others to it.\textsuperscript{90}

Secrecy has a major downside, in this present world, it will be very hard for the giant corporations to maintain secrecy. Also, the data itself cannot be protected as they are scattered and collected from different sources. The challenge here is that a lot of the value of Big Data depends, as we have seen repeatedly, on the ability to have access, and preferably open or free access, to as much data as possible.


\textsuperscript{87} Ibid.


The recent EU code on trade secrets protection seems technologically outdated already, in respect of modern data industry which resulted due to Commission’s lack of understanding the importance of data economy while preparing the Directive. It is not clear from the recent regulation as to what extent trade secrets protection would be effective for data produced by smart products.

Big Data brings an important change; it become much tougher to know who generates which data or what is in those data, it also becomes hazardous not to grant relatively free access to data. The value in Big Data comes from the reorganization of data from different sources or assembling data in different ways. Therefore, businesses that open up their data are more likely to regain value from those data and they get more value from the data that is most open and can be easily reached. This is likely to change the existing business trends as it demands more openness towards data sources. As a consequence, it will contradict with the secrecy aspect.

In comparison with others, Big Data matches the most with trade secret, however, further investigation is required to analyse them in detail and how the existing laws on trade secret are capable to handle Big Data. To sum up with, trade secrets protection is much narrower in scope than an exclusive data use right indicating such exclusive protection would contradict with the fundamental right of freedom of information.


93 Ibid.

94 Ibid.
3.2.5. Protected under Contract Law

At present, big data is being predominantly managed under the provisions of contract law. As a matter of fact, considering the vague status of data economy, contract suits the most. However, for long run, it has to fail as contract law would establish a monopolistic trend where the giant corporations will be able to manipulate the situation, blocking emergence of new competitors. Although, contract law provides wider scope for parties where they can have different arrangements and flexibility to adapt to different situations in different sectors of data industry, this can also be the source of unfair competition as there is no guideline for protection of information. Overall, big data can be regulated under contract law, but for a temporary basis only, there should be some principles established for regulating the industry of big data.

3.3. A New Form of Intellectual Property?

The widespread excitement that big data has inspired should be tempered by the fact that secrecy, rather than disclosure, is the most powerful legal tool to protect many investments in this new arena. Data cannot be reused effectively on a large scale, if there is insufficient information describing its provenance and pedigree.95

Some might conclude that, unless our intellectual property system is somehow modified, the grand vision of big data will never be realized. Big Data itself is a new form and to deal with this, we might need a new Intellectual Property right as well.

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3.4. Complexities with Data Ownership

Data ownership is itself controversial in nature as some argues data is not something to be owned rather regulation is needed as how to monitor access to data. It is challenging to come up with any concrete set of rules to dictate ownership. This is because the very issue of data ownership is surrounded with multi-dimensional problems, such as,

Data economy is a very diverse concept an includes numerous circumstances within it. The big data industry is contemporary topic and it keeps changing every day expanding its scope rapidly. It is therefore, very difficult to come up with uniform rules that fits all the circumstances. For example, data processing in healthcare sector is way different data collection in respect of operating smart cars.96 As the data economy and the use of smart products are presumed to be in all different fields of modern life, the legislation on data ownership needs to be adequate enough to fit them all.97

One of the basic criteria of big data is velocity implying the continuous change. The existing intellectual property system is widely focused on protecting intangible assets which does not fit with the highly dynamic data where the asset is real-time and accurate information.98

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97 Ibid.

98 Ibid. p.41.
Chapter IV: Access to Data

4.1. Need for Regulation

With the announcement of ‘Free Flow of Data’ initiative in 2016, the European Commission would particularly work on removing the restrictions on the free movement of data aiming for the enhancement of cross-border use of data.\(^99\) The protection of personal data is not within this scope and lies outside the domain of ‘Free Flow of Data’ as this initiative focuses on commercialization of data.\(^100\) EU’s notion on this has also been supported by other


forum like OECD as a study in 2015 showed that promoting access to big data is needed to generate maximize benefits for society.\footnote{OECD. 2018. Data-Driven Innovation: Big Data for Growth and Well-being. Accessed from \url{http://www.oecd.org/sti/ieconomy/data-driven-innovation.htm} on 03 May 2018.}

Over the past few years the application of internet has made this big data accessible to anyone-especially the use of social network sites like Facebook, Twitter, Instagram, Myspace and many more. People randomly uploading their videos, images personal contact number on such sites without getting even know that they have just shared their valuable information-open to all. Although some sights say they provide privacy, but in actual sense-do they? As we are living in an age where it’s a prime need to know or exchange information in a moment from anywhere, but does it imply that we can just share information like this? If so who takes the responsibilities of our data that we are uploading freely? Does it remain our data?

To start from the core, Big Data is our data, individual’s data. From us, corporations get these data and then they process them according to the demand. From the very basic, these data belong to us. But, then it was not valuable. It can be compared with oil. Oil is very valuable, but not the crude oil, it needs refinement. Big Data has the same analogy, like oil, data turns into valuable only after being processed, before that, the scattered and individual data does not have any value market.\footnote{ECONOMIST. 2017. The World’s Most Valuable Resource is No Longer Oil, but Data. Accessed from \url{https://www.economist.com/news/leaders/21721656-data-economy-demands-new-approach-antitrust-rules-worl}ds-most-valuable-resource on 17 February 2018.}
Here comes the role of the corporations. If we analyse it with database protection, it can be said that their effort cannot be denied. Corporations invest a lot by various means to get these data processed. They deserve a large piece of the cake, for sure.

The important question lies here, who is capable of using these data and re-use them accordingly? This is most important part as it involves the economic gain. The answer is not as simple as the question as there are different stakeholders involved and as the most vibrant mode of business, the economic aspect also need to be taken care of.

The question of personal data is not the matter of issue for this research, rather this project aims to identify how non-personal data is being handled by the companies. The corporations are mainly following contracts to deal with big data, however, it requires it to be accessed by third parties to run the desired functions smoothly. European Commission’s policy on ‘Building a European Data Economy’\textsuperscript{103} acknowledges the need of data producer’s right, however, in most of the cases, the \textit{de facto} holder may be unwilling to give access to data to third parties which they are otherwise entitled to or such access is beneficial to ensure free flow of data.\textsuperscript{104} Free flow of Data is another European policy which EU follow in order to build the European Data Economy.\textsuperscript{105} There is no concrete policy as to determine how access of data need to be controlled and with focusing on the data producer’s right only, we will overlook the free flow of data. In reality, companies follow contract law to give access to the contracting


firms, however, in most cases, they deny third party access, which hinders the flow of data. Also, ignoring data producer’s right will lead us to a dispute headed for competition law. Therefore, there need to be a balance and a specific set of rules to ensure free flow of data complying with other aspects of law and accelerate the smooth running of the new era of Internet of Things (IoT).

4.2. Conflicts with Competition Law

The debate and literature on how and whether competition policy should react to the advent of big data has exploded within a remarkably short period of time. The discussion is mostly driven by the enormous success and expansion of firms in the digital economy such as Google or Facebook whose business models are largely built on the control of user data.

There is in fact growing awareness that control over big data should play a more prominent role in assessing market power and dominance, not least in the framework of mergers. The EU merger cases of Google/DoubleClick\footnote{Commission Decision of 11 March 2008, Case No. COMP/M.4731-Google/DoubleClick, \url{http://ec.europa.eu/competition/mergers/cases/decisions/m4731_20080311_20682_e_n.pdf} accessed on 10 May 2018 as cited in DREXL, J. 2016. Designing Competitive Markets for Industrial Data – Between Propertisation and Access. \textit{Max Planck Institute for Innovation and Competition Research Paper No. 16-13}, p. 42. Accessed from \url{https://ssrn.com/abstract=2862975} on 03 May 2018.} and Facebook/WhatsApp\footnote{Commission Decision of 3 October 2014, Case No. COMP/M. 7217-Facebook/WhatsApp accessed on \url{http://ec.europa.eu/competition/mergers/cases/decisions/m7217_20141003_20310_3_962132_EN.pdf} accessed on 10 May 2018 as cited in DREXL, J. 2016. Designing Competitive Markets for Industrial Data – Between Propertisation and Access. \textit{Max Planck Institute for Innovation and Competition Research Paper No. 16-13}, p. 42. Accessed from \url{https://ssrn.com/abstract=2862975} on 03 May 2018.} are among the first cases where control over user data in terms of 'data concentration' was taken into account for assessing the effects of mergers on the online advertising market. Yet in both
cases the Commission held that the emerging data concentration was not sufficient to significantly impede competition in this market. The growing role of data in the digital economy has also convinced competition law enforcers to further develop their policies as regards the impact of control over data on competition. Yet this discussion on how competition law should react to the challenges of the data economy and big data is based on a particular perspective.108

For instance, in a world of big data analytics involving techniques of data mining by searching datasets for correlations, negotiations about access to data may simply fail because of information asymmetries regarding the value of the data. From an institutional perspective, competition law enforcers are able to ban identifiable anti-competitive conduct, but they are not well equipped for regulating markets ex ante by imposing positive rules of conduct in form of behavioural remedies that require on-going monitoring.109

At the outset, it is to be noted that it is not important whether data to which access is requested is protected by intellectual property (IP) rights or not. Even in cases in which neither IP protection nor trade secrets protection is available, but the holder of data can rely on factual exclusivity provided in particular by technological protection measures, a refusal to grant access can be captured as a refusal to deal under competition law.110

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110 Ibid. p. 45.
4.3. Recent Disputes

Microsoft\(^{111}\) is a unique precedent for refusals to grant access to data because, in this case, the interoperability information for the Windows operating system as such was not freely available to the competitors in the market for work group server operating systems. Yet Magill\(^{112}\) laid the foundations for dealing with the issue of information-based dominance. In the light of its utility, namely, to rely on statistical correlations among semantic information contained in larger sets of aggregated data for generating new knowledge, such datasets have to be considered a kind of resource which is distinct from concrete semantic information such as in the case of Magill. Yet assessing dominance in a world of big datasets by using the concept of substitutability remains a most difficult task, since even the petitioner for access, such as a big data analyst, will often only have a vague understanding about the kind of data contained in the dataset and about which data will produce the most valuable new information based on observable correlations.\(^{113}\)

However, larger collections of data will generally guarantee a higher level of accuracy of the new information, since such information derived from correlations of data within such datasets is based on statistical likelihood. Hence, just as in the case of multisided platform markets, the collection of datasets for the purpose of enabling big data analysis may exercise


particular network effects and enhance market power of the firm that controls access to the larger dataset. The same may occur in the case of data-sharing platforms.

Since registration and digitization makes the information retrievable and treatable, including for purposes of big data analysis, the digital data should be considered a product with added value that differs from the original, publicly accessible information. As regards cases\(^\text{114}\) on refusal to grant access to data, this may well mean that indispensability cannot be argued where the information as such is freely accessible and it is only a matter of registering the data in a digital form.\(^\text{115}\)

The judgment in Magill, where access to the relevant information was controlled by a copyright, can only be explained by the very low standards of copyrightability under the British and Irish copyright case-law of that time, which most likely can no longer be maintained against the backdrop of more recent copyright decisions of the CJEU.\(^\text{116}\) To the extent that there is trade secrets protection, the question is still left unanswered by the European Courts whether the test on refusals to license an IP right would also apply. Yet if the European legislature decided to create a new intellectual property right in data, this may well make it more difficult to control access to data based on European competition law since, then, there


\(^{115}\) Ibid.

should be less doubt as to whether the additional requirement of the prevention of a new product applies.¹¹⁷

In cases on access to data, the product offered by the entity that seeks access to data can be enormously diverse. If it is about use of the data by big data analysts, the new product will consist in new knowledge or information which may then be offered in a secondary information market.

4.4. Data Access inside and outside of Contractual Regime

Big Data is currently being managed widely under the regime of contract law as the corporations are most comfortable with this. However, things changed as there is new law on data protection.¹¹⁸ The rule on data portability in Article 20 of the General Data Protection Regulation can be considered more one of consumer protection than of data protection.¹¹⁹ While the relevant data covered by Article 20 is personal data as protected by the Regulation in general, the purpose of the data portability provision is not to protect the individual's moral interests.¹²⁰

¹¹⁹ Ibid. Article 20.
¹²⁰ Ibid.
Rather, the rule is designed as an access rule that will enable the individual to switch to other suppliers where access to the data is crucial for competition to work. Since this rule on data portability constitutes a most suitable form of pro-competitive regulation, there is no reason why the right to data portability should be limited to personal data. The lock-in effect is not necessarily restricted to such data. Beyond consumer contracts, a lock-in problem can also arise with regard to industrial data where suppliers want to take data with them concerning the quality and longevity of their parts after the termination of the supply contract with the manufacturer of the final product.\textsuperscript{121}

Regimes for access to data outside of existing contractual regime are more difficult to monitor. Data is not an unprecedented exercise for legislatures and existing models can be considered for cautious generalizations and potential transfer to other cases. In any event, access regimes outside of existing contractual relations depends on using certain criteria to balance the interests involved between exclusivity and access and this can be mentioned as the kind of information contained in data, the identity of the data holder and the business model through which it generates data and, finally, the person or entity seeking access and the kind of use this petitioner is intending.\textsuperscript{122}

\textbf{4.5. On-going Development}

EU is currently working on ensuring free flow of data as it is one of the priority projects of European Commission. Commission recommends considering more targeted data access


\textsuperscript{122} Ibid. p. 59.
rights that would introduction of a general data access right or a generally applicable ownership, data producer's right, access to data, data portability.

According to scholars\textsuperscript{123}, access to data will be key personality rights, including in particular the right to data and potential legislation on a data producer's right as a right of the owner and thereby help the data producer to use the data and to where the user has a clear interest in access to the data. In this regard, the potential right of data access could even be vested with the right of data access not only in its own interest data portability rule of Article 20 General Data Protection\textsuperscript{124} personal data and on the free movement of such data and repealing Directive data access right for the beneficiary of the use of sensor-equipped where the user of a device is in need of access to the data.\textsuperscript{125}


\textsuperscript{124} GENERAL DATA PROTECTION REGULATION (GDPR). Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of natural persons with regard to the processing of personal data and on the free movement of such Data, and Repealing Directive 95/46/EC.


Nusrat Jahan Shaba
Chapter V: Conclusion

To progress further with new regulations or may be newer forms of Intellectual Property Rights is not going to be easy as the existing stakeholders may likely oppose this as they do not know who the new right holders are going to be.

Germany, with its gigantic technological advancement, started to work on management of big data a long ago than EU. In 2011, Germany launched ‘Industri 4.0’ initiative to optimise the manufacturing process and the logistics sector aiming to promote ‘Internet of Things’.126

Since then, there has been seen a resistance from the industry owners for introducing a new right for data ownership as they felt it may lead to scarcity of data and distort innovation.127 In Luxembourg hearing, 2016, industry participants preferred data-sharing relying on contract law, along with this, the concept of ownership deemed as a non-fit for data economy and introducing a new right was perceived as government intervention.128

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Obviously, there are grounds for such resistance. Among others, one ground can be the uncertainty as to whether the new rights will bring more benefits or hazards for the existing investors, whereas, another concern may be regarding the ownership status as some may fear losing their control over data then.\textsuperscript{129}

Company X manufactures car and they are automatically getting the updates of the performance of the car. These updates can also be required for insurance. Free Flow of Data aims at ensuring access of these updates to both, however, Company X will always try to prevent others from getting access to it as it will harm their competition in business.

There are different stakeholders regarding big data and their interests are different which makes the ownership concept a bit more complicated here. The driving details of a person are important to different people, like, for the manufacturer to analyse how to improve the existing model, for the insurance company to know about the driving pattern, for the municipality to know about the traffic of certain area. It is difficult to come up with a new right that will cover all of these.

If the ownership is conferred to every single entity to whom specific data can be allocated, then it may result in multiple ownership which in consequence can have negative impacts on access to data, leading to the situation of a ‘tragedy of the anti-commons.’\textsuperscript{130}


BIG DATA DATABASE: Loopholes Regarding Ownership and Access

One thing that needs to be taken care of very seriously before coming up with any solution regarding ownership and access to data, is to understand the actual scenario of the market in this regard. We must think of a collective solution which serves all aspects not only for today, but also for tomorrow.\textsuperscript{131} If we do not remain careful in doing so, it may end up hindering data economy rather than fostering it, for example, introducing \textit{sui generis} database right in EU as the Commission had to admit that there were no evidence showing this new right had expected economic effects.\textsuperscript{132}

Big Data is an interesting, developing and to some extent, vague area in respect of law. The actual value of Big Data is in its flow, not its sources. Practically, ownership of data needs to be analysed from a different angle and it is yet need to be settled and there are different suggestions available as to what is best suited to determine ownership of Big Data. There are different options discussed which are considered as the tool to dictate ownership for Big Data, like, Copyright, Trade Secrets, Patent, Database Protection etc. However, there are also some ideas to come up with a new type of intellectual property right to deal with this. In addition to it, laws regarding Big Data needs to be in conformity with privacy law, competition law, contract law etc.

In reality, companies follow contract law to give access to the contracting firms, however, in most cases, they deny third party access, which hinders the flow of data. Also,


ignoring data producer’s right will lead us to a dispute headed for competition law. Therefore, there need to be a balance and a specific set of rules to ensure free flow of data complying with other aspects of law and accelerate the smooth running of the new era of IoT. There is no concrete policy as to determine how access of data need to be controlled and with focusing on the data producer’s right only, we will overlook the free flow of data.

Although, there is no specific answer to the existing issues regarding Big Data, there should be development to deal with it. The future of big data and its impacts can never be denied, therefore, rather than being inactive, progresses should be made to cope up with technology in future.
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