LAW, NORMS AND FREEDOMS IN CYBERSPACE
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TITLE 8
Through a Lawyer’s Eyes:
Data Visualization and Legal Epistemology

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« What is the use of a book – thought Alice – without pictures? »

Introduction

Can one apply one of the most quoted lines from *Alice in Wonderland* to books on the law? And, as the law is generally expressed in writing, to any legal discourse?

In this short article I would like to present some of the problems arising from two related phenomena:

a) The first is commonly known as the « Big Data Revolution », i.e. the growing production, storage, processing, use of billions of billions [« zettabytes »] of data¹.

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J’ai connu Yves au début des années 1980, à l’aube du droit de l’informatique et de la protection des données personnelles, mais Yves, pionnier en ce domaine, avait déjà beaucoup écrit sur ces sujets. Nous nous sommes rencontrés à l’occasion d’une des premières conférences internationales organisées par le CED de la Cour de Cassation italienne sur les enjeux de l’informatique juridique et du droit de l’informatique. Ettore Giannantoni (1939-2002), un autre pionnier dont je suis débiteur, comme je le suis envers Yves, nous avait présentés. En rédigeant ce bref article, je me souviens de ces beaux jours passés et de ceux qui nous ont conduits sur cette route.

¹ I have tried to present a few of the various legal issues arising from this topic in V. ZENO-ZENCOVICH, G. GIANNONI CODICIGLION, « Ten Legal Perspectives on the “Big Data Revolution” », *Concorrenza e Mercato*, Vol. 25, 2016, pp. 29-57 (and available on line at https://papers.ssrn.com/abstract=2834245, version 2017.12.27) where the most relevant readings are listed.
b) The second – one could say, inevitable, consequence of the first – is the presentation/representation of such data through some sort of image (a graphic, a chart, a drawing, etc.) *i.e.* « data visualization ».

The first phenomenon is related to what is called « datification ». The whole world – and what happens on it – and growingly also what we know of the universe – is represented through digitalized information: data, which is created by humans, animals, machines and objects. Satellites, drones, CCTVs, single devices collect images of everything, of everybody and of everyplace, creating a duplicate world. Every action, fact, event, even the most insignificant is registered by some device and becomes part of the « datasphere ».

We used to know through observation and experience. Now, increasingly, we know through data, and tools created to search them, discover what one is looking for, and organize the results (data analytics).

The process of datafication has seen a dramatic increase with the deployment of the « Internet-of-Things » (IoT) technologies which collect and transfer data concerning objects, their whereabouts, their surroundings, and their use.

The second phenomenon is related to the transformation of our contemporary societies into hedonistic societies in which images play a dominant role; pleasure passes through our eyes. Once there were films, television, outdoor posters and advertisements. Nowadays every moment is filled with images, still or in motion, which are shown on tiny or huge screens, everywhere, anywhere. One has passed from the age of imagination to that of images. One sees, learns, and believes what is represented though an image. Data visualization is part of this process.

One can assume from an acquired knowledge of neurosciences that words – whether spoken or written – penetrate the minds of human beings differently from images. Different parts of the brain are affected. Countless empirical researches have shown that the meaning of an image can often be more rapidly seized and retained than the words that express the same content. Images go beyond language and cultural barriers. Their persuasiveness appears much stronger than that of mere words. Saying that somebody has been killed is not the same as showing his or her corpse. Saying that 1% of the population holds 90% of world income is not as effective as showing a pie in which such a proportion is graphically depicted.

We shall take it, therefore, for common ground that images can – I repeat, can, but not necessarily do – convey a much more immediate and effective information than words.

Greek philosophy has abundantly debated and reasoned upon how one knows through images that are created by the mind itself, and one can find the modern expression of the principle in David Hume’s *Enquiry on Human Understanding*. Psychologists and neuro-scientists have thoroughly deepened this line of research, moving from a high philosophical ground to that of empirical and medical evidence. We know that a very large number of people ultimately take decisions on the basis of notions that they have acquired mostly through images and which super-impose themselves on the pre-existing mental pattern.

Why is this issue important for lawyers?

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5 ARISTOTELE, *Of the soul*, in parts 3, 7, 8 and 9 analyses in detail the relation between thought, understanding, knowledge, images and imagination, to the point that « the soul never thinks without an image ». And in *On Interpretation* (part 1) « just as all men have not the same writing, so all men have not the same speech sounds, but the mental experiences, which these directly symbolize, are the same for all, as also are those things of which our experiences are the images ».

6 D. HUME, *Enquiry Concerning Human Understanding* (1748): « Perceptible objects always have a greater influence on the imagination that anything else does, and they readily convey this influence to the ideas to which they are related and which they resemble » (Section 5); and « Philosophy teaches us that images (or perceptions) are the only things that can ever be present to the mind, and that the senses serve only to bring these images before the mind and cannot put our minds into any immediate relation with external objects » (Section 12) (available at [http://www.earlymoderntexts.com/assets/pdfs/hume1748.pdf, version 2017.12.27.](http://www.earlymoderntexts.com/assets/pdfs/hume1748.pdf))

CHAPTER 1. Can the law be datified?

One can move a preliminary objection to the relevance of data visualization in the field of the law. Although it is commonly said that the law falls within the field of social sciences, the statement appears to be superficial. There is a fundamental difference between what are commonly qualified as social sciences, viz. economy and sociology, and the law. The former are of a descriptive nature, in the sense that in order to reach a result one must first study, investigate, measure social phenomena and extract from these researches a rule or a maxim which describes, as faithfully as possible, what has been observed.

The latter, instead, is essentially prescriptive, or deontic. Not how things are, but how they should be: « Thou shalt not kill » remains a valid rule whatever the murder rate in a society. Therefore, while datafication is an essential - albeit not the only - feature of social sciences, it is not required for the law, which expresses non-commensurable values (can one seriously and objectively measure the value of life, limb, and liberty?). Equally the construction of a legal system, the logic through which rules are applied and the relations which one must establish between norms cannot be datafied, in the sense that they cannot be described in numerical terms, and even if that were possible it would be scarcely significant: the majority of contracts are properly performed; a minority are not performed. But we create rules and remedies mostly for this phenomenon of a lesser size. There is therefore little sense in trying to visualize what is an intrinsically intellectual and moral operation, just as it makes little sense trying to apply « data visualization » to religious beliefs.

CHAPTER 2. Can one simplify legal notions?

There is a second objection to the applicability of data visualization to the law. Legal norms, in contemporary societies, create extremely complex relationships. They are meant to satisfy and accommodate the most diverse interests. Despite widespread—and not altogether devoid of good reason—criticism against the unnecessary complication of present-day legal systems, it makes little sense attempting to simplify through visualization processes which are intrinsically complex. To use a metaphor, a legal process cannot be represented as the figures of an assembly kit. If the aim of visualization is that of better conveying difficult notions this aim is at odds with the ontological formalism of legal norms. While social norms tend to be flexible, adaptable and variable, legal norms tend to be strictly expressed, construed and applied. There would be little sense if everybody could interpret traffic rules, tax regulations, and contractual obligations on the basis of simplified mental processes conveyed through visualization. It appears difficult to justify non-compliance because one has not read and understood the norm but simply looked at a picture depicting its content. Surely there are elementary legal commands that are expressed visually (typically, traffic signs) but this is a formalization of the norm, which must be represented in the way—and only in that way—described by the law. In general, however, there is a little room for images. The law speaks through written words to the mind of the addressee. We could assume that we are all blind, but able to understand the meaning, the import, the consequences of the norm and of compliance/disobedience to it. One can expand this objection to other, albeit scientific, fields of knowledge: quantum physics is extremely complex and often counter-intuitive. Can we teach and train students and scientists by showing them some brightly coloured infographics? Or describe the functioning of the nervous cells of the brain through well-drawn charts? One has the impression that as one is not able to understand, or to extract appropriate notions from the millions of data, one simplifies everything through a picture. Talent is surely necessary to simplify difficult notions, provided, however, that these can be understood, and not only by a handful of data high-priests.

CHAPTER 3. The law as an image

There are however other aspects that must be considered and which result in down-playing the force of the arguments that have been set out

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8 One cannot even attempt to open here the vast library devoted to the use of quantitative analysis in science and in social sciences. Suffice it to suggest as an Ariadne’s thread on the use of mathematics as the “only and correct” language to express the rules of physics and the “empirical law of epistemology” E. P. Wigner, “The Unreasonable Effectiveness of Mathematics in the Natural Sciences”, Communications on Pure and Applied Mathematics, Vol. XIII, 1960, pp. 1-14, esp. p. 10.

9 See G. Sartre et al. (eds), Approaches to Legal Ontologies. Theories, Domains, Methodologies, Hoetum, Springer, 2011 (and at p. 25 the reproduction of a 16th century diagrammatic representation of systems of legal concepts).

10 This opens all the issues related to the semantics of law; see R. Kamlon, The Law as a System of Signs, New York, Plenum Press, 1988.
In this context a graphic depiction could be felt as necessary, just as over two centuries ago official journals were created to ensure public and widespread knowledge of the law even though there was a 90% rate of illiteracy. The law-makers might be under an obligation to make the law clear and therefore to use also pictures, images, and graphics when disseminating it.

CHAPTER 4. Images as legal rhetoric

There is a further element that compels us to consider the role of data visualization in the law and in a lawyer’s activity from a different perspective.

Although the law is essentially grounded in deontic premises and in logical rules, it is – indeed it must be – persuasive. A rule which does not convince those towards whom it is addressed has very few chances of being followed and has at least very high compliance and enforcement costs.

Rhetoric is always present in legal texts, legal writings, and legal speeches. The preamble of a Constitution, the preliminary report for a new piece of legislation, the oral pleading of the parties in a trial are some of the most obvious examples, among scores, in which logical arguments are constantly commixed with rhetorical figures.

Very often they are expressed through visual means: statistics, scientific evidence, details of the crime scene, forecasts. This strategy of communication and persuasion increases when the law must interact with non-legal aspects. In these cases, it is necessary to explain to a lawyer to other lawyers, situations that require a legal decision, whether general or specific.

The law does not live in a bubble as an intellectual construct. It is necessary to govern all social aspects to be investigated and understood, through all the means that are commonly used. It makes little sense to assert some sort of purity of the law, immune to the suggestions and the
CHAPTER 5. Potentialities and pit-falls of data visualization in a legal context

If digital technologies and all their paraphernalia, including data visualization, are inescapable, the problem remains as to how they should properly be used in a legal context.

One should distinguish the different cases.

a) The first and the most obvious is the use of images in legal didactics. Students have always been exposed to charts and diagrams of systems and processes. What can data visualization teach them, more and better?

A first example could be frequencies in legal issues: how common is it that causation issues arise in tortious litigation? Ultra vires in business transactions and in company controversies? Incompetence or self-defense in crimes? Partiality in administrative proceedings? Such patterns should be able to transfer to students the notion of why some highly technical notions of the law are so important and give rise to considerable debate. As a matter of fact one might discover, through data analytics that certain aspects, to which handbooks devote considerable space, are firmly settled and fall within the physiology of legal transactions.

A second example could be that of the relationship between different areas of the law. We have all been brought up, in our university curricula, with rather clear partitions of the law, which correspond to hurdles, i.e., the exams to be taken and passed. Afterwards we learn, in real life, that things are not so neatly drawn and separated. It could be useful to show graphically, already during their fundamental courses, how taxation issues influence choices in a contract; the connections between company law and financial markets; between human rights law and financial crimes. This is not meant to substitute the fundamental logical bearings of legal education but rather to supplement it with a visual topography of the system and what could be called its demographics.

b) Normative texts could also profit from visualizations. Not only through their content and what is required from the addressees of the norms, but also in real time interaction with citizens. Especially in the fields of taxation and of social security, rules are significantly tailored to the profile of each individual. Their application depends upon one’s own continuous choices, on choices of other individuals, on normative changes.

It is possible to simulate the outcome? In some areas predictive analytics are already widely implemented. Decisions that must be taken rarely are clear-cut and present a wide range of options which data visualization could present through colour patterns. Contemporary administrative procedures require constant co-operation between public entities and addressees of the norms. An informed citizen can take a more molar decision, which is not only in his/her own interest but also fosters the public good. The same principles could easily be applied to private transactions (financial investments, consumer contracts, etc.) eventually mandated by general legal provisions.

c) The use of data visualization in court hearings and in general in litigation is the object of widespread TV and film representation. Generally, the use of images is to promote the “Truth”. Sometimes it is suggested that they mould the minds of judges and juries becoming the winning card in a case. Clearly this is a typically American frame of mind, which places the trial at the centre of the legal scene. One may doubt that in Europe the impact would be the same. However, one can reasonably expect that especially in highly emotional criminal trials, both prosecution and defence will try to win the day through inferences presented graphically, to which an aura of scientific reliability is given. On a much more common level one can imagine similar uses to profile the identity of spouse in a marital controversy or of a driver in automobile accident litigation. Once a tool is available it would appear to be bordering on professional carelessness not to take advantage of it.

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16 For an interesting project, full of open suggestions, see M. Hagan, Law by Design (open access at http://www.lawbydesign.co/en/home/, version 2018.1.31); and even more the website by the same A.

http://www.openlawlab.com/project-topics/Illustrated-law-visualizations/ version 2018.1.31

19 E.g. « Bull », the CBS legal drama, is based on the use of neuro-sciences in trial management by a rather unscrupulous law firm.
d) Although the opportunities and the seductions offered by data visualization are manifold, one should not overlook the equally relevant objections that have been set out in the first two sections (viz. Can the law be datafied? and Can one simplify legal notions?). The first caution that one must consider is that data are not neutral. They depend on who, how, when, where they are collected. The typical blunder is to use data collected on-line ignoring the sociology of those from whom those data are generated and imagine that the result is a reliable representation of the whole population. Furthermore, data are generally collected for certain purposes, ignoring data that is irrelevant for that purpose. If one then uses that data for different purposes, it is not unlikely that errors may occur. Above everything hover human fallacies: have the devices been correctly installed? Is the data accurately collected and processed? Is the data analyst up to his or her task? One cannot therefore take data for some kind of unshakeable scientific truth. It is necessary to investigate, verify, clarify, distinguish and eventually impugn the reliability of the data used. But this is not something that can be done by lawyers, who must rely on specialists from other fields. This brings us to a further warning. Until the mid-20th century, policy decisions were mostly taken by individuals who had a legal education and knew how to do things with rules. Then economists entered the scene, profoundly influencing the turn of great or small policies. Nowadays, this role is increasingly taken by computer scientists whose professional status is unclear, whose role is rarely transparent, and whose activity does not appear to be subject to professional and deontological standards. In other terms, a norm is known by the public and anybody can challenge it on the basis of other norms. However, this is rarely the case if behind the norm there are data and algorithms. Data accountability becomes therefore a central issue in any modern democracy: but this accountability is not only of a technical nature but also, and primarily, of a deontic nature. What are the biases that govern the inferences in data analytics: age, sex, race, location? What are the assumptions upon which predictive analytics are grounded? What, if any, are the goals pursued: Efficiency? Fairness? Equality? Social justice?

Once the data is transformed into a visual representation, these problems are even more significant, because the data is further removed from its original source and presented by another specialist with seductive colours and shapes. The choice of images is also highly subjective and left to the whim and ability of the visualization expert. One could easily adapt to visual analytics the age-old quote attributed to Lord Darmesteter: « There are three kinds of falsehoods: lies, damned lies and visual statistics ». One is therefore forced to immediately question the reliability and veracity of legal arguments based on visual representations.

Finally, one must stress the point we have departed from: the use of images in the law poses highly complex epistemological issues, modifying the century-old intellectual bearings of lawyers. This is not to say that these should be un-modifiable, but suggests that changes must be supervised by full awareness. The caution is that images cannot substitute for purely intellectual knowledge, but can usefully supplement standardized forms of understanding, provoking deeper and new insights.

Conclusion

On a less problematic tone, one can revert to the initial quote from "Alice in Wonderland" which has been, on purpose, abridged.

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21 This danger was clear in ancient times. Pseudo-Euclides, in his Naturalis Historia (Book 25, IV, V) points out how some Greek botanist were using drawings to represent plants. However, « verum et pictura fallax est coloribus tum numerosis, praesertim in amuleationem naturae, multumque degenerat transcriptionibis sordidam praeteram eum est singularis earum aetas pingi, cum quadri pertis varietatis minus faciem mutaret ». Therefore, according to Pliny, subsequent naturalists returned to describing plants only through words.


The full citation is: "Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, "and what is the use of a book," thought Alice "without pictures or conversations". Lewis Carroll is therefore suggesting that there are equally entertaining and mind provoking ways of arguing and convincing. And "conversations" brings us straight to Socrates' dialogues, which still are one of the standing blocks of Western civilization and of its legal thought."  

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24 And in conversations, obviously. Socrates uses images: "A statue that is tied down, though, is very valuable, because the man's works are very beautiful. What am I driving at here? True opinions. True opinions, for as long as they remain, are fine things and do nothing but good. But they don't hang around for long; they escape from a man's mind, so that they are not worth much until one tethers them with chains of causal reasons. And these, Meno my friend, are threads of memory, as previously agreed. After opinions are tied down, in the first place they become knowledge; secondly, they remain in place. That is why knowledge is prized more highly than correct opinion; knowledge differs from correct opinion in being tied down." (Plato, Meno).