



HAL
open science

An introduction to ethics of data: how philosophy shapes our decision-making process.

Adrien Tallent

► To cite this version:

Adrien Tallent. An introduction to ethics of data: how philosophy shapes our decision-making process.. Master. Paris, France. 2022. hal-04026997

HAL Id: hal-04026997

<https://hal.science/hal-04026997>

Submitted on 13 Mar 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Cours EM Lyon – Ethics of data

45 min / 15 min questions

Presentation:

First, let me introduce myself. My name is Adrien Tallent, I am a PhD student in philosophy at Sorbonne University, I am doing my PhD with the SNCF (the French railway company) which allows me to have a field of application in the corporate world. Before that, I attended a business school, Grenoble Ecole de Management.

Currently, my research is about the ethics of data and the democratic issues that arise from the massive use of personal data. I try to understand how the exploitation and the massive use of data disrupt the social contract at the foundation of all our human societies.

An introduction to ethics of data: how philosophy shapes our decision-making process.

Today, the use of data at every political and economic level changes the way companies deal with their clients and employees and States with their citizens. The data is a currency that the user, the client or the citizen provides, most often unconsciously. By this new kind of contract we delegate part of our decision-making power as well as the possibility of acting on our choices and opinions.

The aim of this conference is to underline the key philosophical views which will influence the way you, as future managers, entrepreneurs, decision-makers, will deal with data issues.

1. DEFINITION | What is data ?

"Data" comes from the Latin word for "given things". It is therefore an old word that reappears to designate the data that can circulate through a cell phone or a computer network. There have always been data captured by states or merchants. In the past, the register of orders and reservations were the grail and made it possible to understand a certain number of things.

For example, in 1911, Cartier noted that its wristwatch, purchased mainly by aviation pioneers, indicated a sportivization of society.

But since the end of the 20th century, the Internet has developed at great speed and with it the question of data has been transformed and has taken on an absolutely unprecedented scope.

Today, most of the world's largest companies are the result of this development. But with this development came a new business model: the sale and exploitation of data. Indeed, by surfing on the Internet, a user generates data about his path, his clicks, his messages, his interactions, his preferences...

And even beyond these Tech Giants, all companies have developed a website and started managing data.

As a company, it is crucial to know all you can about your clients (what do they like? How often do they purchase? What are their revenues? etc...). And data allow you to know all those things like never before.

All these "data" are then captured and are a gold mine for merchants of all kinds.

The data is the currency that the user provides, most often unconsciously via the *General Terms of Use*. These "Conditions" that we accept are thus similar to a contract that we agree to sign without even reading it. Like the social contract by which human beings transfer a part of their decision-making power to a king, a president... In order to make a society.

By this new kind of contract we delegate part of our decision power as well as the possibility to act on our choices and opinions.

If the entities using this data for governance purposes wish to appropriate it, use it and enhance it, they must understand it, their role and the impact that this data capture and management implies.

When an employee - just like a potential customer on a commercial site - performs an action, he or she produces data that will eventually be used by the company to optimize and make decisions. We leave traces every time we use our phone, go on the internet etc..

At what point should the data be used? Can we really trust data blindly? What impact does the use of data have?

Data is by its essence restrictive since not all information that potentially has an impact on the way I perform a task can be captured.

An ethics of Data is therefore also a global understanding of the issues.

2. ISSUES | Why is it important today to think about it from a philosophical point of view?

The issue surrounding data is most often approached from a purely "technical" point of view, yet it is much more than that and needs to be invested in philosophy.

Companies often tend to consider ethics from a legal point of view in order to protect themselves from risks towards their customers, employees, suppliers and partners. Thus they try to respect the different laws such as the European Union's GDPR (General Data Protection Regulation) or more recently the European Parliament's Digital Service Act.

However, ethics as such, comes first of all from philosophy. It is a discipline dealing with moral judgments at the basis of the standards of an individual and a society.

The data is a source of immense opportunities. For companies of course, but also for States and even for citizens. The latter are becoming more and more attentive to the use of their data. And as a decision-maker, you cannot do what you want with personal data.

This kind of legislation in a way confirms the fear of the citizen-employee-user who sees his data being exploited for the good of large companies - when he is a customer - or to 'track' him - when he is an employee - but not his own interest.

In what sense could we reflect on a broader ethic, which could take into account all the legal and philosophical aspects of the issue? Is meta-ethics possible?

Today, companies have to face a generalized mistrust: customers/users have the feeling that their personal data are, whatever happens, not used in their interest.

1. Data have value

Data (personal or not) have value. We must be aware of this as a company but also as a user.

Since the advent of the digital world and the companies that have emerged since then and that have become the largest companies in the world, a business model has particularly developed: the attention economy. It is obviously the core of service companies and especially social networks.

Basis of it: they know how to use cognitive biases and design that make us stay as long as possible on the platform, in order to expose us to targeted advertising. As a comparison: advertising represents 97% of Facebook's turnover (which recently became Meta).

Moreover, the amount of data is exploding:

2003: 500 M connected objects for 6.3B people = 0.08/person

2020: 50 M for 7.6B = 6.58/person

This data gives these companies great power to understand the world.

Exs:

- Mark Zuckerberg, the CEO of Facebook, used user data to predict which Facebook users will form relationships (O'Neill 2010)
- researchers have used Twitter data to predict box office receipts for movies (Asur and Huberman 2010)
- and Google has used search data to track flu outbreaks around the world (Ginsberg et al. 2009) well before the Covid-19 pandemic

The Data economy is becoming an increasingly large part of GDP, and the job prospects are enormous in this sector. The digitization of the world is putting digital data at the center of economic and social exchanges.

Data economy in the EU

2018 : 2,4% of EU GDP

2025 (forecast): almost 6% of EU GDP

Between 2018 and 2025, the European Commission expects the number of data professionals to double.

The existence of this master's degree at EM Lyon is proof of this.

2. But it also generates problems

Power

The power of data as a power of control (control society, influence...).

It is important to understand that having data on an individual is having power on this same individual. By providing consciously or unconsciously data to companies or a State we give them the possibility to know us precisely and thus we give them the power to influence us, to manipulate us...

The proof: today the scandals of using personal data for political purposes such as the Cambridge Analytica scandal and their role in key elections such as the election of Donald Trump or the vote on Brexit demonstrate their power.

Security

Question of data security.

All strategies aimed at amassing large volumes of data are now threatened by the risk of an information hold-up.

Ransomware, cyber attacks...

Of course, we cannot treat in the same way the behavior of private hackers, mafia or not, and that of public hackers, dependent or not on the secret services.

But the borders are sometimes tenuous... Since Snowden and the revelations on the practices generated by the Patriot Act in the United States, we have known that sensitive data on people held by companies can be misused.

There is no absolute technical answer to these risks. The best answer is for the entire company to be vigilant, starting with its manager.

But experience shows that managers prefer to dream about the happy prospects of digital technology than to face the harsh realities of cybersecurity.

Neutrality of technology

It is often said that technology is neutral. In Plato's Gorgias, Gorgias defends a purely instrumental conception of technology. E.g.: a knife is used to cook but also to kill someone. It is only a means.

But this assertion, apparently irrefutable, is in reality not so irrefutable.

There is a misunderstanding of things when we say that technology is neutral. For 3 reasons :

- We shape technology (according to our values, goals, mindsets, resources, education...), and technology shapes us. Every choice in the design, deployment, implementation or use of technology has downstream impacts on society. These choices influence mindsets, actions and behaviors. Thus "defaults" are not default, ever.
- Then, society shapes technology (financial pressures, social dynamics, geo-political pressures, cultural norms...). All the more a pb when sometimes the society does not respect our values and the techno, by learning, is copied on the society.
- Finally, humans are shaped by techno, just as the physical design of a building or the way a city is laid out influences the way people feel and interact in physical spaces.

It is wrong to think that a means is just a means. Every means implicitly serves an end, and in the case of technique, of technology: this end is the domination of nature (in the broadest sense).

Technique is a way of unveiling reality, its meaning is metaphysical. This is why Heidegger says that "the essence of technique is nothing technical".

Interpretation with data

We think that data is cold, true, omniscient but it is false, it is only an interpretation of reality from some data that we seize and that we do not seize.

Galileo said that *"nature is a book written in mathematical language"*: by objective data we could see and understand this nature. But these data are by nature imperfect. They integrate the biases of different human societies. All the more so when they concern human behavior.

However, statistics and algorithms are now asserting themselves as fundamental tools for knowledge, but also for decision making.

This vision of data as "the truth" is in fact the symptom of a human dream: the dream of predicting everything, of knowing everything. In a way, it is about replacing "God". Thanks to data, we could see everything, know everything, anticipate everything. But this dream is by definition a dream.

Beyond a technological and economic revolution, big data creates an epistemological revolution, a new regime of truth. Sales proposals are refined thanks to the location of customers and the early identification of their concerns. Maintenance and even Police, justice and health are becoming predictive.

The social sciences themselves delve into what is exchanged on social networks to answer questions about the links between the intimate and the collective and, in the age of globalization, to escape the national limits of large statistical surveys.

In fact, data should not be confused with information. **Sven Ove Hansson**, professor of philosophy at the Royal Institute of Technology in Stockholm, explains that: *"Data differs from information in the extent that it doesn't need a form that lends itself to assimilation. If, instead of a book [of sociology that I am reading now], I read the tens of thousands of questionnaires on which this book is based, I would be looking at data instead of information. In short, data must be processable in order to be considered as information and assimilated in order to become knowledge."*

Data are elements coming from the sensors, they are relative to the measured level of any variable. Information consists of data organized in a given structure and which, placed in a context, is endowed with meaning. Knowledge goes further: it allows us to make predictions, establish causal links or make decisions.

It would be illusory to claim the absolute objectivity of data, and to maintain that there is no intention or project in the data.

Measurement, in itself, proceeds from a discrimination between all the measurable data of a phenomenon: you choose to measure this variable rather than that one, and by this filter you thus define a reality, the one, in a way, that you need to know.

3. Also it is necessary to invest the philosophical field, to be aware of the stakes

Therefore, we understand that the data is actually restrictive. It shows you only a part of reality. A data (or a datum if you want to speak Latin) is not a fact but its interpretation, its partial measure.

Awareness is rising

Currently, there is kind of a "repentance movement" of Silicon Valley engineers who were at the origin of a whole bunch of innovations in the field. For instance, the man who invented the "like" button on Facebook confessed that it was a terrible mistake and that he was sorry. Or, Tristan Harris, Former Google engineer, who has founded the Center for Humane Technology, in order to help people understand the impact of technology.

The last one being Frances Haugen, a former employee from Facebook who leaked thousands of pages of Facebook files, about the social network algorithm : when she was autionned by the American Congress, she declared that Facebook had no control on its algorithm.

Trust

It is necessary to build a relationship of trust with customers/users as well as with its employees. Today, there is a generalized form of suspicion. We all assume that all companies exploit our data against our will and for their interests.

Ccl/transition

Opportunity

Therefore, data analysis is a source of infinite opportunities. As a company, it is normal to want to use the data we capture on our customers in order to increase their loyalty, to offer them new products or more personalized services... The use of data thus allows an improvement of the service, a better customer relationship (because it is more personal) as well as a better use of resources.

Data is also history and for a company, the danger is what is not predictable

The problems then come mainly from the lack of transparency, the lack of communication, and therefore the lack of trust.

How can you differentiate yourself in the midst of all this noise? From a financial point of view of course, but citizens are starting to pay more and more attention. And it is therefore the duty of companies (and business schools of course) to respond to this need.

Just take the example of Apple today, which has set up a system that allows us to reject the capture of our data when we go to an application on our smartphone.

But it depends on the philosophical approach you have.

3. PHILOSOPHY | Different thoughts according to philosophy and geographical consequences

What is ethics? Ethics, unlike morality, is therefore situated in the conduct of action and not in the action itself. Actions that can be judged as morally wrong can be carried out for ethical reasons.

"Morality calls me to be just, worthy, and respectful; Ethics demands that I act justly, worthily, and respectfully what I am".

Tristan Garcia - *La Vie intense*

Let's take the example of lying: if lying is wrong, I can decide to lie to someone close to me for their own good, to protect them from harm.

Ethics is a fundamental reflection on which morality will establish its standards, its limits and its duties. Its formulation is characterized by normative, prescriptive or evaluative statements - from this point of view it will be interesting to look more precisely at the Kantian imperatives.

Moreover, the notion of ethics inevitably refers to **Spinoza's Ethics**. Spinoza's aim in his work is to lead us "as if by the hand" towards beatitude, real joy, through a series of Propositions, demonstrations, axioms, definitions and scolies.

Ethics is then a way of leading one's life to know this true joy.

1. Data are changing our society and businesses

Social contract

From **John Locke's** conception of the state as a "neutral judge" to Jean-Jacques **Rousseau**, John **Rawls** and others, all social contract perspectives ultimately seek to explore why rational individuals would be willing to give up some of their freedoms in exchange for living in a political order.

- The state and the political order exist for the general interest of the people to protect life, liberty and private property.
 - The question now is how all this changes with the widespread exploitation of data.
- Big data not only generates inequalities in manipulable knowledge, it reinforces them. Beyond a certain threshold, these inequalities leave the public at the mercy of the entities that own the data and protect the owner from any form of retaliation. The possibility of voluntary social cooperation is dangerously threatened; indeed, such cooperation would no longer be rational, since the system (which is no longer equitable) has ceased to be mutually beneficial.
- Social contract theory tells us that individuals choose to give up certain rights in exchange for protection from the life of the state of nature.

Rousseau's famous phrase that man must "be forced to be free" argues precisely that freedom can only exist when the citizen renounces his selfishness and subordinates himself to the law created by the collective of citizens (of which he is a part): by obeying popular sovereignty, the individual will not fall back into the state of nature, which is implicitly a state of war.

Thus, rather than limiting individual freedom, law (and civil society) is its expression. However, some concrete steps must be taken to ensure that the current pitfalls of the system are stopped before they further weaken or damage the social contract through the inevitable erosion of civil liberties and human dignity.

- With the exploitation of data: loss of trust. Sense of abuse of personal data. Need to be able to "monitor the monitors". Need for transparency, accountability. Need for a framework for Big Data practices if we want to keep trust.

Change laws and constitutions to protect the privacy and freedoms of citizens, in order to foster a more ethical, transparent, accountable and dignified social order, and consequently, a world order.

- Security measures are important, but no amount of surveillance, no matter how sophisticated, can ultimately eradicate the sources of insecurity if individual and collective inequalities, injustices, and dignity deficits are not seriously and impartially addressed, both nationally and globally.

This is primarily due to the emotional, amoral, and selfish nature of man, which is accentuated in today's world by increased awareness, instant connectivity, empowerment through information and communication technologies, and growing transnational and transcultural interdependence.

Transparency

Veil of ignorance

A philosophical notion developed by Thomas Hobbes, John Locke and Immanuel Kant, and taken up by John **Rawls** in his book *Theory of Justice* (1971). It is a method for establishing the morality of a problem that relies on the thought experiment of putting oneself in an original position and disregarding one's tastes, attributes and position in social space.

The veil of ignorance is a way of thinking about the system separately from one's own interests. Individuals are selfish and therefore will choose what suits them.

Under the veil of ignorance, individuals choose 2 principles of justice:

- Principle of freedom and equality
- Principle of difference: inequalities are ok only if they benefit to the least advantaged persons and avoid a greater injustice

Principle of difference is based on the fact that a society should not / can not be egalitarian but should allow equal opportunities and put forward merit.

With data, everything is seen, everything is known (or at least thought as such). Nothing is left to mystery, to change.

Self-fulfilling prophecy: we think that you act and think in a certain way. Therefore, companies try to predict your behavior at all costs, in order to know before you do, what you want to buy.

So everything is adapted to that, you are only shown what they think you want to see and when faced with these choices that are not choices, you behave as they predicted and so on.

Ecological fallacy : Inferring behavior from an individual based on aggregated data.

Ex: of course he likes football, after all it is the most popular sport in the world.

This is part of the problems of the predictive logic of data that ends up creating the result that we thought we were predicting.

Today with data: everything can be known. We can know your driving behavior and provide you with an adapted insurance, and instinctively if we tell you that you are a better driver than someone else, you will refuse to pay the same rate as him because he puts himself in more danger.

Data individualize. Everything is individualized, personalized. And so the social contract is weakened. Data diminishes charity, fraternity. We tear the veil of ignorance. By the social

protection set up in the XXth century: principle of charity. Which is undermined today. When we no longer have an efficient solidarity system, we are forced to depend on charitable associations.

Today, digital technology breaks down the borders. The feeling of belonging to the national community is weakening in favor of different local or international communities.

The society that emerged from the French and American revolutions is a world of theoretically free and equal citizens, who enter into contracts with each other in which the parties engage their individual responsibility.

It was up to each individual to protect himself against risk (old age, illness, accident) by his own foresight or by calling into question the person at fault (the worker who was the victim of an accident at work had to prove the fault of the employer).

At the end of the 19th century : laws on work accidents. Concept of collective insurance used for the first time on a national scale. By placing the accident under the register of chance and the hazards of fate, one is given the means to go beyond the notion of individual responsibility. It was on this new basis that the whole system of social protection that marked the emergence of the welfare state in the 20th century was gradually organized.

The response of the insurance system is based on the "mutualization of risks". Why do we accept the burden of this solidarity? Because we are aware that each of us is at risk, and that we do not know in advance who will be the victims of accidents or breakdowns.

It is this uncertainty about our future, this veil of ignorance, according to the effective metaphor of John Rawls, which is the basis for redistribution. And today, this veil is being torn apart.

Society is becoming more and more transparent. Will we still accept this solidarity if we know that some are at risk and others are not (data, predictive analysis...). All advertisements, companies, promise more and more "individualized" solutions because it would only be fair to pay only the right price without taking care of people more "at risk".

Data governance within companies

Companies must therefore set up data governance bodies. Who manages data? For what purpose? Who is responsible? What protection for personal information? Which data to use?

Importance of a "data culture": data governance must include everyone, not just the top managers. Make data accessible. Train employees on the issues

2. Control society (state as a company)

But above all, the massive collection and exploitation of data raises fears of the development of a "control society".

Developed by Gilles Deleuze, the expression refers to a society in which citizens would be subject to a constant control of their actions.

The Chinese example of "social credit" already shows that this possibility exists.

In democratic societies, the hypothesis of an autocratic, totalitarian government is quite unlikely. The control society as such emerges in reality from the multitude of control authorities to which we give everything - most often without realizing it: the technological companies.

The rating of services, and therefore de facto of individuals, the compilation of huge databases on our persons, algorithmic regulation according to models of unparalleled obscurity... There is no shortage of examples that make us slip into what can be called a society of control.

Many objects participate in control as such - computer, smartphone, connected bracelet, voice assistant... - Control as it is deployed in our contemporary societies does not emerge from a totalitarian government, it is not a single power but a myriad of micro-powers, which, put all together, participate in the de facto existence of control.

Companies capture our data, know our desires, our tastes, our secrets... and use this data to target us. The customer/citizen is controlled, his actions monitored and noted.

There is no central totalitarian power that controls us all and all the time but a multitude of micro-powers that end up controlling us, i.e. depriving us of our freedom and determining us. One of the characteristics of control, besides its totalizing aspect in the present, is also to have a hold on the future.

The specificity of the instruments of control is to categorize people, to put them in boxes according to various characteristics (age, sex, social background, interests, personality...).

From then on, by making us correspond to predefined stereotypes, it becomes possible to predict a hypothetical future according to the analysis of these data, of these stereotypes.

This is why we must be aware of this power, of these risks. You have to know what is behind the exploitation of the data in order to have an accurate vision of it.

3. Enthusiasm: data for good

Among the liberals who see the exploitation of data in a positive light, two positions can be distinguished:

- Today in Silicon Valley, one thought dominates: the utilitarianism of **Jeremy Bentham** [1748-1832]: the principle of maximizing the pleasures of the greatest number in relation to their pains.

Data entrepreneurs see the exploitation of data as a way to bring pleasure to their users, without moderation. This thought explains the development of social networks and models of massive exploitation of personal data.

This is the position of Mark Zuckerberg, of Elon Musk... for whom the goal of technology is to eliminate all suffering.

- But within liberal thought, **John Stuart Mill** is opposed to Jeremy Bentham. Mill, who was a disciple of Bentham, ended up challenging his way of evaluating pleasures and pains in a uniform way. In his eyes, everyone should be able to develop his own conception of value, even if it is wrong. Freedom can be erratic.

What matters is that the individual be as complete and singular as possible. I must be able to do what I want with what I possess.

Based on this distinction, the French philosopher **Gaspard Koenig** applies Mill's thought to data: Each person must be able to choose the data he delivers to companies, that they come to ask you for your terms and conditions. Ownership, in this sense, is a way to give power back to the individual, to take him out of the market.

This mentality (in its two forms) is very prevalent in the United States for example. In *An economic theory of privacy* (1978), **Richard Posner** depicts the notion of privacy as harmful to the market in that it deprives agents of information in their decision-making.

Consequently, it would not seem justified to grant a particularly high level of protection to data, but rather to authorize its free alienability, in particular by creating a property right for the individual over his or her data.

For the common good

But whether one is libertarian or more statist: they have a shared conviction that data can be used for the common good

Public service

When used properly, data can make public services more efficient, simplify procedures, help those who do not know about the aid that the State can provide, allow administrations to share data (within certain limits, of course), and make the State more transparent.

- Emergence of the notion of "citizen public service" from the Open Data provided by the State, citizens can in turn provide a public service.

The best example was what happened during the Covid-19 pandemic when citizens, universities, and companies seized the data made available by the State to offer a follow-up of the epidemic, to help with the booking of vaccination appointments...

Research

But in the medical field, the data (if they are anonymized) can, for example, help to find new treatments thanks to artificial intelligence, to accelerate research against cancer, incurable diseases...

For example: IBM's Watson is used in medical research

4. Today, geographical differences that represent these different approaches

Today, we observe that these differences in philosophy towards data materialize in different geographical areas.

United States

In the United States, it's the wild west. They try to innovate for the sake of innovating, without worrying too much about questions (even if this is changing little by little). Innovation is only seen as a way to make money, to conquer (or create) new markets.

As we saw with Richard Posner, the United States does not look kindly on government intervention in this area. They therefore rely more on the initiatives of private companies, which then enact "rules of good conduct". This is a "laissez-faire" approach.

The United States has a much broader conception of the "freedom of expression" guaranteed by the Constitution. This position can be seen, for example, in the recent comments of Elon Musk, who wishes to show himself as a defender of total freedom of expression on Twitter, which he has just bought.

Similarly, the scandals of data siphoning for political purposes such as Cambridge Analytica have mostly affected the United States because of its weaker legislation on political advertising.

China

In China, data is seen almost solely as a means to control society. Chinese citizens are tracked, followed, the state assigns them a "social credit" rating and all their transactions go through the WeChat application. Sitting on these gigantic amounts of data, Chinese companies have perfect databases to develop more and more intrusive tools.

In general, several Asian countries are less shy about using personal data. In South Korea, for example, a democratic country, the personal data of individuals was used to track patients and their contacts during the Covid-19 pandemic.

Europe

As far as Europe is concerned, it is often said that "when the United States invents a technology, China copies it, and Europe regulates it". It is true that Europe tends to do this, but it also represents a 4th way: a more human way.

This is the idea of the GDPR adopted by the European Union in 2016 and more recently the Digital Service Act adopted just a few weeks ago

But data protection law at a European level has existed since 1995!

This path is linked to a difference in philosophy. In the United States, the approach to the data issue is more mercantile, data is a "product", a "means"... In Europe, on the contrary, decision-makers tend to associate "data" with the individual in the same way that we associate "our arm" with our body.

Idea of giving meaning to technology to accompany humans towards a better society through protection and regulation.

Respond to the need of users/consumers to control their data.

Obviously this attitude has a cost: that of preventing the development of a real European competitor to the American tech giants (who see a powerful competition emerging in China).

But will the winner of the technological challenge be the one who develops the most invasive technologies or the one who seeks to make them coincide with an enviable horizon at the risk of being less in control of these technologies?

Maybe the best example of it is that the US is step by step getting closer to the EU on data regulation.

CONCLUSION

Through my intervention : tried to show you the importance of philosophy even in a case that does not seem to call for it.

Today, Data are changing the rules of the game. The digital age changes our society and the way to do business.

As future managers, future decision-makers and entrepreneurs, you will have to ask yourself these questions about the use you will make of your customers' or employees' data within the company.

The recent developments of the Metaverse and the blockchain technology open a new era of data management and raises numerous concerns about transparency, the question of who owns the metaverse and the regulations needed...

Thank you all !