

Legal and ethical issues of Data Science (technolegal@AUEB)

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1. Course Description

Data Science is growing rapidly being nowadays a key tool for an increasing number of aspects of social and economic life, influencing the ways in which we create, we produce or even the way we live.

The legal and ethical issues that data science faces have such a variety and depth that their investigation, in the framework of a course, cannot be but indicative of the emerging issues in the field. Similarly, it may only touch upon the tools, institutional, technical, economic and legal that we have at our disposal in order to address such issues. Hence, this course has as its primary objective to devise a methodology for identifying, analyzing and resolving legal and ethical issues that relate to data science, rather than providing a specific solution.

The issues addressed by these course are primarily issues of regulatory theory: What is the nature of the problem of regulating information technology and what is the methodological approach it invites? In this course, we follow a techno-regulatory approach, analysing the reasons behind an approach that accepts as the only way to regulate the extremely volatile and, hence, uncertain and complex environment that data-centric technologies produce is the use of the very same technologies and, indeed, of data science as a regulatory mechanism.

On the basis of the aforementioned methodological approach, this course comes to borrow elements from the fields of law and policies that relate to data science. Indicatively, we mention intellectual property rights, public sector information law, elements of corporate law and data protection law. These fields of law are examined in a series of vertical thematic areas, where different problems of law and data science emerge. More specifically, we examine the areas of public administration, research and education and culture and industrial production.

By adopting such an approach and until the course is concluded the student is expected to have obtained the necessary theoretical and practical knowledge, so that she is able to analyse the basic aspects of information law and to design techno-regulatory systems that make addressing data science problems easy to address.

The course content comprises of the following units:

1. Introduction to techno-regulatory approaches for the resolution of data-science application issues
2. Law and Policies for IPR in the context of data science: case studies from the areas of research and culture

3. Law and Policies for Public Sector Information I (Access to Information and Reuse of Public Sector Information): case studies from the public sector as well as data-entrepreneurs making use of such data.
4. Law and Policies for Public Sector Information II (Geodata, Meteo-data): Case studies from the public sector information and geodata entrepreneurship
5. Law and Policies for Research and Education: Case studies from the area of research and education
6. Law and policies regarding Personal data protection and bioethics issues: Case studies from Life Science (Biology, genetics, medicine)
7. Future trends in the area of technoregulation: Legal issues related to phigital items, meta-products and the Internet of Things

2. Course Objectives

The course aims at achieving the following learning objectives:

- To have the students understand the basic features of designing and operation of techno-regulatory systems and to be able to implement them in different environments and contexts
- To understand the operation of the core legal fields that regulate information, their historicity, their function and their future perspectives
- To acquire the necessary skills in order to resolve issues of regulating data-science activities in different areas of social and economic activity
- To assess advantages and disadvantages from the impact of data-science in different types of institutions and to envisage the creation of new institutions that contribute to human well-being and prosperity
- To seek innovative regulatory solutions for issues emerging from the application of data science

3. Books

For techno-regulatory issues we recommend the books by L. Lessig and Y. Benkler as well as by J. Kallinikos with regards to the key feature of technology as a regulatory element:

Lessig, Lawrence (2006) Codev2, Basic Books, New York <http://codev2.cc/download+remix/Lessig-Codev2.pdf>

Benkler Yochai (2006) The Wealth of Networks, Yale Press, Yale http://cyber.law.harvard.edu/wealth_of_networks/Main_Page

Kallinikos, Jannis (2011) [Governing through technology: information artefacts and social practice](#) Technology, work and globalization. Palgrave Macmillan , Basingstoke, UK. ISBN 9780230280885

4. Assessment Scheme

The assessment scheme will have as follows:

1. Group project (30%): Analysis and design of a techno-regulatory system or prototype for the resolution of one of the problems that have been indicated in the case studies that have been presented in the context of the course.
2. Individual Essay (40%): 3.000 words essay on one of the theoretical issues that have been presented in the context of the course
3. Mini Project (30%): Creation of a Wikipedia entry or contribution in another Wikimedia project on an area related to the themes of the course (either theoretical or related to a case study)

5. Detailed Course Programme

The curriculum of the course comprises of the following units:

5.1 Introduction to techno-regulatory approaches for the resolution of data-science application issues

In this unit we explore core concepts of techno-regulatory theory as it has been described by Lessig, Benkler, Kallinikos and Black. We present regulation as the accumulation of the regulatory capacity of technology (here data and their infrastructures), laws, markets and social norms. In addition we explore the question of how we may develop truly participatory structures in relation to the production of regulatory rules when we transpose from the realm of law to the realm of technology or the market. In addition, we present the interaction between different forms of regulation and their core differences. We examine the core role of some of the technological infrastructures in the relevant regulatory ecosystems, and –in particular- the role that information and information systems play in the regulation of almost any human activity. This unit also explores the raise of the phenomenon of the informatisation of regulation, i.e. the appearance even in the case of the legal regulation of elements that we would normally find in the case of developing information systems. This is a phenomenon that is further intensified in data-centric environments and activities (e.g. use of Digital Rights Management Systems, Customer and Vendor Relationship Management Systems and Open and Privacy by Design Systems). This unit also explores optimum strategies for the design of techno-regulatory systems.

Bibliography:

Benkler, Yochai. "Coase's Penguin, or Linux and the Nature of the Firm." *Yale Law Journal* 112 (2002): 369.

Benkler, Yochai. *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. New Haven and London: Yale University Press, 2006.

Lessig, Lawrence. *Code : Version 2.0 ; Lawrence Lessig*. Vol. 2nd ed. New York: BasicBooks ; [London : Perseus Running, distributor], 2006.

Brownsword, Roger. "Code, Control, and Choice: Why East Is East and West Is West." *Legal Studies* 25 (2005): 1–21.

Brownsword, Roger. "Neither East Nor West, Is Mid-West Best?" *Script-Ed* 3, no. 1 (2006): 15–33.

Wu, Tim. "When Code Isn't Law." *Virginia Law Review* 89, no. June (2003): 679–751.

Black, Julia. "Proceduralising Regulation: Part I." *Oxford Journal of Legal Studies* 20, no. 4 (2000): 597–614.

Black, Julia. "Proceduralising Regulation: Part II." *Oxford Journal of Legal Studies* 21, no. 1 (2001): 33–58.

Kallinikos, Jannis. "Recalcitrant Technology [electronic Resource] : Cross-Contextual Systems and Content-Embedded Action," n.d. <http://is.lse.ac.uk/wp/pdf/WP103.PDF>.

Kallinikos, Jannis and Leonardi, Paul M. and Nardi, Bonnie A. (2012) [The challenge of materiality: origins, scope and prospects](#) In: Leonardi, Paul M. and Nardi, Bonnie A. and Kallinikos, Jannis, (eds.) *Materiality and Organizing: Social Interaction in a Technological World*. Oxford University Press, Oxford, UK, 3-22. ISBN 9780199664061

5.2 Law and Policies for IPR in the context of data science: case studies from the areas of research and culture

In this unit we approach Intellectual Property Rights as a core tool for the regulation of Information. Having as our starting point the historical operation of Intellectual Property as a means for the establishment of incentives in order to produce and disseminate their intellectual work, we investigate the raise of IPR in today's economy and society as a tool for the regulation of almost any digital creative activity. As such we pose the question of the limits of the role of IPR in areas as wide as the industry, research and innovation. In this process we give great emphasis in processes of semi-automated clearance of rights, machine readable policies and licences and the use of data science for managing different forms of IPR. In addition we explore the possibility of using crowd-sourcing tools, language technologies and Big Open Linked Data for the resolution of issues of mass clearance of data as well as the use of crowdfunding and micro-financing tools for the alternative funding of creative and intellectual creations and the resolving of the problem of incentives in the case of intellectual production. Finally, we explore Wikipedia as a case study for understanding the phenomenon of crowdsourcing and collective intellectual creation.

Bibliography:

Murray, Andrew. *The Regulation of Cyberspace: Control in the Online Environment*. New York, Abingdon: Routledge-Cavendish, 2007.

Tsiavos, Prodromos, and Naomi Korn. "Case Studies Mapping the Flows of Content, Value and Rights Across the UK Public Sector." London: Joint Information Systems Committee, 2009.

Aaltonen, Aleksi Ville and Kallinikos, Jannis (2012) [Coordination and learning in Wikipedia: revisiting the dynamics of exploitation and exploration](#) In: Holmqvist, Mikael and Spicer, André, (eds.) *Managing 'Human Resources' by Exploiting and Exploring People's Potentials*. Research in the sociology of organizations (vol 37). Emerald Group Publishing Limited, 161-192. ISBN 9781781905050

Καλλινίκου. *Πνευματική ιδιοκτησία & Συγγενικά Δικαιώματα*. Αθήνα, 2000.

Καλλινίκου, Διονυσία. *Πνευματική ιδιοκτησία & βιβλιοθήκες*. Αθήνα: Π.Ν. Σάκκουλας, 2007.

Καράκωστας, Ι., and Α. Μαρίνος. “Το Internet και οι συνέπειές του κυρίως στο χώρο του δικαίου.” *ΕΛΛΔ* 39 (1998): 2–14.

Κοινωνία των πληροφοριών και πνευματική ιδιοκτησία: η ελληνική ρύθμιση. Αθήνα: Αντ.Ν. Σάκκουλας, 2003.

Μαρίνος, Μιχαήλ-Θεόδωρος Δ. *Πνευματική ιδιοκτησία*. 2η έκδ. Αθήνα: Αντ.Ν. Σάκκουλας, 2004.

5.3 Law and Policies for Public Sector Information I (Access to Information and Reuse of Public Sector Information): case studies from the public sector as well as data-entrepreneurs making use of such data.

In this unit we explore core issues related to the transposition of the EU Directive and Policies on the re-use of Public Sector Information, the key principles of the laws for open and e-government as well as the issue that different entrepreneurs face in the context of using access to public information as the basis for their business model. We explore issue of regulatory structure, use of the relevant technologies (particularly aggregators, APIs of Open Linked Data in the regional, national and supra-national level), data structuring, licensing frameworks and policy frameworks. The case study explores some of the key public sector information systems, such as Diavgeia, ermis, ESHDYS, ΚΗΜΔΣ, opengov.gr and data.gov.gr to juxtapose them to other international systems such as the UK legislation.gov.gr. Objective of this unit is to understand the design logic, the techno-regulatory dimension and the degree to which these systems and regulatory environments are in the position to correspond to the regulatory system that created them.

Bibliography:

Σωτηρόπουλος, Β. “Περαιτέρω χρήση πληροφοριών του δημόσιου τομέα (Ερμηνεία Ν.3448/2006)”, Αθήνα 2007

Τσιαβός, Π. “Από τα ανοιχτά δεδομένα στη δημόσια πληροφορία” Αθήνα 2015

5.4 Law and Policies for Public Sector Information II (Geodata, Meteo-data): Case studies from the public sector information and geodata entrepreneurship

In this unit we explore the issue of regulating the production, sharing, management and dissemination of geodata both in the public and private sector. We explore the logic and operation of the INSPIRE Directive as well as its application by different organisations in Greece and abroad. In this unit we explore the regulatory structure and operation of different data sets, particularly those involving background layers, infrastructure registries and movement data. We explore their relationship with mega-platforms, such as those provided by Google, Facebook, AirBnB and Uber, but also multiple micro-applications that collect and share/ distribute different geo and other data related to Points of Interest. The questions posed in this unit relate to the issues identified in unit 5.6 with regards to personal data, whereas particular emphasis is given in the critical juxtaposition of technologies that increase the control of the platform on the individual (netocracies) with technologies that allow the user to be the epicentre of the decision-making process ((vendor relationship management (VRM) technologies) ή στην κοινότητα (Free/Open technologies).

Bibliography:

Konstantinos Nedas, Kalliope Pediaditi, Spiros Athanasiou, Prodroms Tsiavos, Giorgos Moutevelis. [Building the Hellenic National Geospatial Infrastructure from Scratch: Challenges, Legislation, Progress and Experiences](#). **INSPIRE Conference 2011, Edinburgh, UK, 2011**

Prodromos Tsiavos, Kaliope Pediaditi, Konstantinos Nedas, Spiros Athanasiou [Cultivating Open Data Ecologies: Lessons from the Implementation of the INSPIRE Directive](#). In **“Geographic Data and the Law: Defining New Challenges”**, Leuven University Press, 2012

Spiros Athanasiou, Kaliope Pediaditi, Konstantinos Nedas, Prodromos Tsiavos. [Gov 2.0 on a tight budget: The case of geodata.gov.gr](#). **TR20110129**, 2011

Κ. Νέδας, Κ. Πεδιαδίτη, Ε. Γρηγορίου, Π. Τσιαβός, Η δημιουργία της Ελληνικής Εθνικής Υποδομής Γεωχωρικών Πληροφοριών και η ενσωμάτωση της κοινοτικής Οδηγίας 2007/2/ΕΚ (INSPIRE) στην Ελλάδα κατά την περίοδο 2009-2013: Αναγκαιότητα, προκλήσεις και προοπτικές

5.5 Law and Policies for Research and Education: Case studies from the area of research and education

In this unit we present the basic elements of the regulatory and policy frameworks for research, education and innovation in European and national level. More specifically we explore the degree to which such policies exercise and influence upon different applications of data science. More specifically, we explore the main trends in data science in research and innovation in the context of EU, OECD, World Bank but also the Greek National Innovation Policy. We explore the concept of the triple helix and of partnerships between stakeholders of different types in the ecology of knowledge as well as the role that data science plays both as an infrastructure and as an outcome of a complex and highly volatile environment. More specifically we explore development in the areas of open science and access and the interoperability between public, commercial and research data infrastructure, the open educational resources, MOOCs, mega-research platforms as well the regulatory landscape that each of these environments creates.

Bibliography:

Gruss, Peter. “Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities.” *Conference on Open Access to Knowledge in the Sciences and Humanities*, 2003.

<http://www.zim.mpg.de/openaccess-berlin/berlindeclaration.html#top>.

Suber, Peter. “Bethesda Statement on Open Access Publishing,” 2003.

<http://www.earlham.edu/~peters/fos/bethesda.htm>.

Budapest Open Access Initiative. “Budapest Open Access Initiative,” 2002.

<http://www.soros.org/openaccess/forum.shtml>.

Suber, Peter. [“Open Access”](#) The MIT Press, 2012.

5.6 Law and policies regarding Personal data protection and bioethics issues: Case studies from Life Science (Biology, genetics, medicine)

This unit explores the multiple regulatory frameworks for protecting information that should not be disseminated beyond a certain space (digital, physical or legal). We explore different legal and broader regulatory regimes, which attempt to tackle the difficult problem of balancing between the need to share information and to comply with specific information protection regulatory regimes. In this context, we explore the basis data-protection regulation with particular emphasis on micro-regulatory environments, self-regulation, responsive regulation and smart regulation regimes. We focus on techno-legal solutions for the regulation of privacy, personal data protection, confidentiality regimes, such as privacy by design, consent management systems and mechanical

policies. We explore case studies that explore different instances of life-sciences regulation, bio-banks, hospitals, genetic material regulation, medical information and social media, medical and bio communities and communities of practice. In all such case we explore ways in which we may balance medical knowledge and experience with crowdsourcing systems, where the need for data-sharing has to be balanced with the need to protect personal and sensitive data.

Bibliography:

Μήτρου, Λ. "Προστασία των προσωπικών δεδομένων," 71–85. Εθνική Επιτροπή Τηλεπικοινωνιών και Ταχυδρομείων, 1999.

Paul Ticher Data Protection vs. Freedom of Information: Access and Personal Data, ITGP, Pinset Masons, Cambridge

Peter Carey Data Protection: A practical guide to UK and the EU Law, OUP, Oxford.

Τσιαβός, Π. "Από τα ανοιχτά δεδομένα στη δημόσια πληροφορία" Αθήνα 2015

5.7 Future trends in the area of technoregulation: Legal issues related to phigital items, meta-products and the Internet of Things

In this unit we explore main future trends in the area of data science and their implication for society and economy as whole. We explore questions related to the Internet of Things, as a source and recipient of data, issues of meta-products design and mass-micro fabrication, data flows over platforms and data streams in immersive environments. Here all relevant issues are related to the entirety of the area of law and technology we have seen in the previous units and the main objective is to provide a coherent theoretical and practical framework, both legal and ethical, for supporting knowledge development and innovation in the context of data science as an omnipresent field.

Bibliography:

Höller, Jan. *From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence*. United Kingdom: Academic Press, 2014.

Troxler, Peter (2011). "Libraries of the Peer Production Era". In van Abel, Bas; Evers, Lucas; Klaassen, Roel; Troxler, Peter. [Open Design Now. Why Design Cannot Remain Exclusive. Bis Publishers. ISBN 978-90-6369-259-9.](#)

Gershenfeld, Neil A. (2005). *Fab: the coming revolution on your desktop—from personal computers to personal fabrication*. New York: Basic Books. [ISBN 0-465-02745-8.](#)

Mikhak, Bakhtiar; "development by design" (dyd02) (2002). ["Fab Lab: an alternate model of ICT for development"](#) (PDF). Bangalore ThinkCycle. Retrieved 6 July 2013.

Julia Walter-Herrmann and Corinne Buching (Eds) *FABLAB (Cultural and Media Studies)*, Hamburg
Chris Anderson *Makers: The New Industrial Revolution*, Random House Business Books, London.

Hod Lipson *Fabricated: The New World of 3D Printing*, John Wiley and Sons, Indianapolis.