

# **THE CHALLENGE OF INNOVATION IN LAW**

**The Impact of Technology and Science  
on Legal Studies and Practice**

**AMEDEO SANTOSUOSSO, OLIVER R. GOODENOUGH  
and MARTA TOMASI (Eds)**

  
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# Innovating about Innovation: An Explanation and an Introduction

Amedeo Santosuosso, Oliver R. Goodenough, Marta Tomasi

## 1. Law is changing

Law is not static. Although both specialists and society as a whole often act as if it is an un-changing monolith, any rational commentator must note that law has evolved over time. Changes do occur, in doctrine, in procedure, in jurisprudential understanding, and in legal education. The factors which drive innovation in law include social transformation, cultural change, and, importantly, the technological possibilities of the times for creating, storing and applying legal information. New technologies can also require new doctrinal developments. As this volume will illustrate, for instance, the advances of robotics are forcing us to enumerate a new doctrine of robo-law.

Such changes often do not come easily for the legal system. The myth of stability is maintained in part because the acceptance by the public rests on this assumption. It remains a myth, nonetheless. The noted American judge and legal scholar Jerome Frank wrote, in his book *Law and the Modern Mind*:

Even in a relatively static society, men have never been able to construct a comprehensive, eternized set of rules anticipating all possible legal disputes and settling them in advance. [...] How much less is such a frozen legal system possible in modern times. New instruments of production, new modes of travel and of dwelling, new credit and ownership devices, new concentrations of capital, new social customs, habits, aims and ideals – all of these factors of innovation make vain the hope that definitive legal rules can be drafted that will forever after solve all legal problems. (Frank at page 6)

This self-proclaimed “modern” understanding was published in 1930. The sources of change which Frank enumerates have only proliferated and accelerated as we move into a world of synthetic biology, neuro-imaging, robotics, and digital computers. Notwithstanding its inherent dynamic of conservatism, and the personal commitment to traditional modes of thought by lawyers, judges and legal academics, law is changing.

The response to change can be reactive, trying to keep up after the fact with bursts of unreflective improvisation, or it can be proactive, with an eye toward intelligent analysis, planning and invention. This later strategy is a true process of innovation, where human intelligence helps to shape the new world ahead of us, with the potential to create better juridical tools and better social outcomes as the process of change rolls forward. This book is about legal innovation; our hope is that it can both spark a purposeful conversation about change in legal practice and legal education and also provide some suggestions on the way that those changes might be more successfully envisioned and implemented.

## 2. The case for Darwinian adaptation: how this book came to be written

This book, together with the course established at the University of Pavia on *Innovating Legal Studies and Practice*,<sup>1</sup> is one of the principle outcomes of a two-year project funded by *Cariplo Foundation* (Milan).<sup>2</sup> The project, as conceived, was very ambitious from both the theoretical and educational point of view – a number of young scholars were to have been recruited in order to work on the specific issues.

The theoretical aim was to verify how and if science and technology may offer tools in order to improve the law making process; the exact title was *Applying Research from Science and Technology to Improve the Law Making Process*.

The basic assumption was that contemporary regulatory systems are increasingly inefficient and unable to respond adequately to the challenges of our times and that these challenges are all, directly or indirectly, referable to the current incremental scientific and technological progress. In the field of law, the crisis of outdated theoretical models, based on the foundation of national states, is evident. The traditional system of normative sources allowed the legal system organized within a national state to establish an order of stable rules to govern the case to be decided. Today, however, this order is extremely various, changeable, controversial and, sometimes, unclear even within the same geographical area, international organization (e.g. the European Union) or national state.

Although the problem is common to all fields of law, the law of emerging technologies (such as biotechnologies, neurosciences, nanotechnologies and

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<sup>1</sup> A report on the course is offered in the Chapter by Maria Laura Fiorina and Giulia Spinoglio.

<sup>2</sup> More information at URL: <<http://www.fondazione cariplo.it/en/index.html>> [last accessed: 09/05/2015].

computing and other informational technologies), and law and economics are particularly troubled fields. These areas of activity have an underlying structure of universality inherent in both their technologies and the economics of their production and use. They also frequently encompass transnational players and events.

The project stresses that the legal regulations of conflicts arising from these areas very often have both a local/national and a transnational dimension. Conflicts arising in the field of cloud computing, for instance, implicate a number of different jurisdictions and rule sets. Finding and applying rules with application across these varying dimensions involves an intense exchange between national systems and supranational levels and entails the coexistence of different languages, with serious problems of legal communication (legal multilingualism).

Our idea was that science and technology are both a cause of the problem (given the speed and transnational nature of scientific progress) and the source of a remedy for understanding and managing the present situation. There is a need to reconcile the expression of legal institutions that have developed in different languages, cultures and cognitive traditions. There is also the opportunity of bringing new modes of conceptualization drawn from science and technology to this task. Identifying the barriers to this reconciliation and providing both modes of an analysis and technological tools that will help to remove those barriers was the work of the proposed project.

We were aware that bringing scientific approaches to law is not simply a matter of imitation. Law should discover that it is less different from science than traditional legal scholarship has taught us and that it has several basic theoretical questions in common with science. At the theoretical level, the project aimed at drawing on developments in the understanding of institutional and mechanism design to help model both the dilemmas of productive sociality and the solutions that are available for instantiation in institutions like the law.

As for the need to overcome the challenges of multilingualism for the transnational exchange of legal institutions, the project proposed the use of an innovative experimental tool, a database collecting caselaw and legislation in the field of science and law: the Multilingual Archive on Law, Science and New Technologies (ALST), an ICT Platform, partially already existing. Meeting the linguistic challenges of transnational law-making through a technologically based experimental methodology has been one of the principal goals and innovations of the whole project.

Thus the two main innovative aspects of the project were: a) the integration of legal concepts and models with those of science and technology to

produce a new methodology that can inform a better approach to law making; and b) testing theoretical hypotheses about legal institutions on a multilingual database of cases and materials, that works both as a legal laboratory bench for empirical tests and as a multilingual tool that will be offered to legal community and society as a whole.

As originally conceived, the educational plan was that two researchers (to be recruited with a research contract) were to be added to the existing PhD students already having a scholarship. The project was based at the interdepartmental research center, *The European Centre for Law, Science and New Technologies* (ECLT), and coordinated by Professor Oliver R. Goodenough and Professor Amedeo Santosuosso.

As with many human endeavors, our actual possibilities have been constrained by our resources. For many reasons (totally not depending on the *Cariplo Foundation* nor on the ECLT at UNIPV) the funds available were around one fifth of the original budget set when we envisioned the project.

At that point the Darwinian adaptation played a major role. Clearly we had to change (innovate?) some important parts of the project, and thus we reshaped our plans for the program, focusing on *Innovation in law*. Our principal actions included:

- we confirmed the main theoretical pillars of science-technology-law and multilingualism;
- we confirmed the Archive ALST as one of the main assets of the ECLT and of the project;<sup>3</sup>
- we decided to take advantage of the great interest of judicial institutions in Milan to contribute to a very original (the first one in Italy and in the EU) project of experimental teaching to students innovative theories of law, giving them a practical grounding in some important technologies in law. This resulted in the ILSP course;
- we decided, finally, to take advantage of the existing group of young researchers at the University of Pavia that have coalesced over the years of Amedeo Santosuosso teaching and researching at the University of Pavia and the Center ECLT.

We asked this group of people not to change their own researches in progress (as we were not able to fully fund them). Rather we asked them to look at

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<sup>3</sup> The project was nominated for the *Innovating Justice* competition in 2013, more details at URL: <<http://www.innovatingjustice.com/innovations/legal-information-querying-across-different-languages>> [last accessed: 10/05/2015].

their research fields with the eyes of innovation in law. They responded with great interest, actively participated to the seminars given by Oliver R. Goodenough and Amedeo Santosuosso, presented and discussed some of their researches and, day by day, discovered the importance of a wider point of view in their work. On the other side, we involved a group of talented law clerks in the Court of Appeal of Milan in tutoring students in the course ILSP and invited them to develop in this book a wider reconsideration on the training process of young lawyers in Italy.

We believe that the result, shared in the volume, is interesting and useful. We are able now to present the work of this network of young scholars (belonging to a number of Italian and EU institutions), who have experimented the possibility to carry on specific researches in law without losing the bigger picture of what is at stake, the role of science and technology in our society. They have shown the importance of the law to discover the deep connection it has with the main conceptual background of science and technology.

### 3. The contents of this book

This book aims at analyzing the impact of innovation on law. This kind of objective is clearly two-fold: on the one side, innovation invests the way law is created, managed, and applied. On the other side, the emersion of new technologies calls for a reshaping of existing legal norms, either by means of an evolutionary interpretation of them or, in some cases, through and abandonment of old-fashioned anachronistic sets of rules, unable to answer challenges coming from the innovated reality.

In accordance with the description of these two paths of innovation, radically changing the face of the law, the book is divided into two parts.

The first one offers a general overview on the systemic, technologically-driven change law is going to face in the next few years.

The idea is that of offering a key for reading current and future trends of innovation (as described, in part, in the three-stage framework offered by Oliver R. Goodenough), in order to oppose the “long-lasting reluctance of legal academy and professionals to recognize and face some occurring changes in law today” (Amedeo Santosuosso). The *leitmotiv* of the book is the relationship between law and technology and the cross-fertilization between entities that cannot be considered as clearly separated and mutually independent. Such an approach allows our authors to detach themselves from views interpreting technology as a tool and law as a mere technique. Rather,

they seek to understand how, with both of them embedded into reality, law and technology together represent the environment in which we live. The “technological side” is nowadays part of the very nature of law, of its essence. Technology gives a privileged viewpoint to understand how law lives in reality, how it moulds reality, and how it is shaped by it.

A clear example of this is how AI has been increasingly transforming the law and the legal reasoning and how predictive technologies and complexity measurement tools can represent reliable means to overcome the “complexity swamp” of the contemporary conception of law (Alessandra Malerba).

Even if something is moving forward, the aspect of law apparently more affected by resistance and opposition against innovation is legal practice. In particular, one of the main challenges in Italy, in Europe and worldwide is that of understanding how jurisdictional IT can transform jurisprudence. A few legal systems are opening trial mechanisms, traditionally based on paperwork, to the wind of change through legal process automation.

An evolution of the judiciary’s attitude toward the way we practice, interpret and apply the law entails a full process of cultural change, not merely a procedural one. Successful advancement in this field passes through the construction of a fresh and novel mind-set based on a strong collaboration between justice professionals and users, representing the real guide towards innovation (Enrico Consolandi, Pietro Consolandi).

And if it is true that everything starts from the beginning, education is a cornerstone of this book. To provide present and future students with a profitable, “fit-for-purpose” education, law schools have to consider the way technology is shaping legal practice as a priority.

In accordance with the practical approach of the book, two Italian experiences are described as possible answers to the challenges stemming from innovation processes.

One is represented by judicial clerkship, introduced by the Italian legislator in 2013, as an opportunity for boost preparation and competencies of young legal professionals in order to access the job market. In a bi-univocal perspective, based on the intention of filling the existing gap between the university education and the work as professionals, students can benefit from the incentives coming from the vivid and challenging court environment, while the whole judicial system can take advantage from young lawyers’ energetic and dynamic contribution (Maria Eleonora Benini, Chiara Colicchia, Federica Fazio).

The second cutting-edge experience is described through an overview of the contents of the new born “Innovating Legal Studies and Practice” course, added in November 2014 to the curriculum of the Law Department of the Uni-

versity of Pavia, providing students with theoretical and practical insights into the meaning of being a lawyer today (Maria Laura Fiorina, Giulia Spinoglio).

Following the first part, dedicated to how technology is affecting the general legal theory and practice, the second part of the book is composed of contributions focusing on specific areas of the law deeply affected by technologies and on concrete consequences, within defined thematic areas, of the innovative trends described above.

The proposed overview encompasses both traditional fields of law and futuristic scenarios which, being not too far away in time, deserve current exploration. The analysis of the first stages of innovations gives a starting point for our discussions.

As a matter of general example, the gigantic dimension which the Internet is assuming in all aspects of life is driving an evolution of private subjects' role in society and, in particular, of Internet intermediaries. These are defined as subjects who mediate online communication, enabling various form of expression and easing transactions between parties on the Internet. Such entities can certainly contribute to the development of democratic movements but they simultaneously hold the technological power to heavily influence users' rights. Law has therefore to reflect upon this emerging role of private actors in order to properly identify duties and responsibilities and to ensure a full protection of individual rights (Maddalena Neglia).

More specifically, the revolutionary strength of technology can be fully appreciated in one of the most traditional fields of the law: the regulation of employer/employee relationships. The introduction of new technologies in the workplace challenges the role of law within the so-called Industry 4.0, characterized by the rise of smart production systems, smart logistics, and acceleration through exponential technology. This trend is eroding the boundaries of workplace and workday. Since rapid innovation is becoming one of the main interests of companies, law has to play its role in striking a proper balance between fostering the development and renovation of the industry and, at the same time, protecting workers' rights with the most flexible and accurate regulations (Barbara Bottalico).

Another very traditional set of rules can be challenged by a technology-driven revolution: neuroscience holds the future promise for the evaluation of witness testimony and the possibility of detecting deception. Federica Coppola adopts a prospective view that temporarily sets aside unresolved elements about the scientific validity of the described techniques. Her analysis anticipates that once these are solved, the law will need to take account of the emerging threatens to witnesses' cognitive and moral liberties, as well as

to the privilege against self-incrimination. She sketches a potential normative framework which might plausibly regulate the use of these techniques in full compliance with witnesses' procedural and substantive rights.

Turning to topics where the impact of technologies is even more intuitive, further challenges come from the need to regulate the biomedical field, where law is once again torn between the need to allow scientific progress and the necessity to protect human rights. Two different approaches are offered, both reflecting on the role of patents, on the structure of their regulations and on the effects of their interpretation with the aim of balancing, in a reasonably flexible manner, biotech medicine, scientific research and moral rules (Carlo Colombo and Avgi Kaisi).

Among emerging technologies a relevant position is occupied by synthetic biology. Such a controversial discipline offers law the chance to inaugurate a fresh approach aimed at avoiding both irrational fears and a complete abandonment to hype and hopes. The equilibrium point between delayed legal interventions in front of new technologies and hypertrophic attitudes can be found in a reasonable "prudent vigilance" approach, entailing "an ongoing and periodically revised process of assessment and management of all the risks and concerns, taking into account the interests of all the stakeholders in a dynamic, cooperative, democratic, open and transparent manner" (Ilaria Anna Colussi).

The same approach, based on a critical observation of reality and its developments, is suggested with reference to another promising technology application. The possible implementation of whole-genome sequencing techniques in newborn genetic screening is a further example of how new technologies are augmenting complexity in society and in the law today. Dealing with the sheer amounts of data to be governed over times determines a stretching in space and time of traditional rights and interests, calling for a full understanding of the object to be regulated (Marta Tomasi).

Two more chapters are dedicated to the field of robotics, presenting features so peculiar to be considered as innovation itself. Robotics, progressively taking more and more importance in the future of our societies, is intrinsically different from every other previous technology, "since it combines data information with the presence in the real world and the capacity to perform physical actions which cannot be completely predetermined" (Chiara Boscarato). There is a strong need for investigating difficulties in accepting machine having human-like properties and high level of intellectual abilities with the aim of identifying the impacts relationships between human beings and machines can have on the law in different fields (Paola Giulia Belloli).

The book, addressed to academics, professionals and students, aims at inspiring critical reflections about theoretical and practical interplays and synergies between innovation and the law. Although most of our contributors are Italian, and the work is the product of an Italian initiative, we have nonetheless chosen English as the language for our contributions to this book. We have done so in recognition that, for the moment at least, English is a more widely understood basis for exchanging ideas in the globalized world of legal scholarship.

In addition, our work on Innovation in law (mainly the course on Innovating legal studies and practice, ILSP) is the result of a cooperation also with other Italian and European academic institutions. We are presently working on the project of an International Network on Innovation and Law and, in this light, English can help again.

#### 4. Acknowledgments

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order to look at the future with a wise dose of optimism and without being blocked by the fear of being considered as disrupters.

Finally, we want to express our great gratitude to the *Cariplo Foundation* for funding a research project, which has been not only successful from a scientific and educational point of view, but also a wonderful occasion for strengthening the cooperation and friendship of an emerging group of young scholars, who, with their enthusiasm and intellectual richness, have made all this possible.