

# I. CHALLENGES OF TECHNOLOGICAL DEVELOPMENT FOR THE LEGAL DEVELOPMENT

---

ZOLTÁN NAGY

---

Hate speech and new technologies raise questions for legal regulation. To answer these questions correctly it is necessary to understand the social and technological context, in which these activities take place, and to describe the social expectations of regulation and the difficulties faced by the legislator in preventing or making it more difficult to apply the law in these specific social contexts. It is important to map the way in which technology is embedded in society and the economy in order to plan for the effects of regulation and to identify the often-inextricable threads of interdependence.

Humanity has undergone rapid biological and social evolution for the age of the Earth and, as the literature suggests, has gone from being an insignificant animal to the master of the planet over the millennia. Today, we are the only species to dominate the Earth, but during this evolution we have caused irreparable damage to the ecosystem, the effects of which we are already feeling, but the future effects of which we can only imagine.<sup>1</sup> Can we make use of the knowledge and opportunities that our social and economic development has given us? Will the pursuit of ever greater prosperity, technological progress and economic growth ensure a meaningful and fulfilling life for humanity. Will scientific progress offer us solutions for the future, providing answers to the problems that urgently need to be addressed. We are witnessing very rapid technological progress, the pace of which is only set to accelerate in the future. Humanity has entered a new age, the fourth age, according to the literature. The most important areas of the fourth industrial revolution are cyber-physical systems, the Internet of Things and cloud computing, data science and

---

<sup>1</sup> Harari, 2017, p. 369.

communication technologies.<sup>2</sup> The authors point out that in some eras of humanity, change has been triggered by technological advances. This development extends to all levels of life. The effects of artificial intelligence and robotics are less felt today, but the impact of network science, the internet and computing on social and economic development is clear.<sup>3</sup> The way people communicate, and transfer data has undergone a sea change.<sup>4</sup>

Innovation and technological progress have been an important condition for social and economic development. Economic growth is influenced by many factors, and four main drivers have been identified in the economic literature: human resources, natural resources, capital and technology. The four elements are important, but economic history shows that technological progress has resulted in large part from rising output, productivity and living standards.<sup>5</sup> The technological aspect of economic growth is highlighted by the growth of the information economy. The literature suggests that this may be a function of two factors, automation and the use of managed information, the explosive development of databases and communication networks.<sup>6</sup>

However, technological progress requires more than just science; it also requires the active role of the state and the economy in providing the resources for technological progress and in applying technological advances.<sup>7</sup> The importance of this is that, according to economic experts, only technological progress can ensure a steadily rising standard of living and economic growth.<sup>8</sup> It will therefore become essential in the future to understand its economic and social importance. This is particularly important given that technology has two important characteristics: it is a non-competitive good and it is not excludable. Technology can be used by several people in parallel, in simultaneous activities, it is usually not in physical form, it can be used infinitely many times and is therefore not a competing good. On the other hand, the lack of excludability is an important feature, as the limited possibilities associated with it may reduce the gains from the technology, as it is difficult to exclude unauthorised users from exploiting the technology. Thus, the role of the state in relation to technological development in general is enhanced. The state intervenes in the market through financial and private regulation to promote R&D. It promotes technological development through direct and indirect subsidies

---

<sup>2</sup> Fülep, Nick and Várgedő, 2018, pp. 45–46.

<sup>3</sup> Reese, 2020, pp. 259–266.

<sup>4</sup> Bell, 2001, p. 23.

<sup>5</sup> Samuelson and Nordhaus, 2012, pp. 475–480.

<sup>6</sup> Bell, 2001, p. 16.

<sup>7</sup> Harari, 2017, pp. 227–230.

<sup>8</sup> Mankiw, 2005, pp. 133–136.

(tax preferences) and addresses the problem of foreclosure by protecting intellectual property, i.e. by creating the possibility that only the inventor owns the technological innovation. These instruments facilitate R&D activities by ensuring that the development pays off and generates profits. Without all these incentives, technological progress would be slowed down and jeopardised.<sup>9</sup> At the same time, modern digital infrastructure is not owned by the state but by private companies, i.e. social media platforms, the framework for the digital public sphere.<sup>10</sup>

However, the extent to which a society can adapt to new technology is also important. If this is successful, technology will be an important factor in economic and social transformation. But the benefits are significant if this adoption happens quickly. However, a key prerequisite for this is legislation, human resources, adequate funding and close cooperation between different sectors.<sup>11</sup>

Technology therefore has an impact on the economy, but also on society, and these also have an impact on technological development. Social and technological developments may be different, but they can also evolve together. Technology is characterised by its social construction, i.e. it is created by people and used by people, so there is an interactive relationship between technological development and social development. It is the transfer of technology that makes a given development a market product, but it is the economic and social environment that makes its diffusion possible. It is very important, however, that technologies are adaptable to the social situation, otherwise their development will stop, and others will take their place.<sup>12</sup> However, social science research also shows that society and technology are not separate entities but interact closely. The relationship between the objects created by technology and their users takes on a specific shape as technology develops. New relationships and interrelationships are emerging between people and the tools created by new technology. A profound change in social relations is taking place, and the relationship between objects and people is becoming more deeply intertwined. The nature of objects is changing, but the social relations of people are also changing. According to the literature, there is a tangible process on the tool side. Objects exist in real and digital space, they have a strong communicative potential, they are increasingly intelligent, they are characterised by a higher level of autonomy and they are strongly embedded in society. Large multinational

---

9 Mishkin, 2015, pp. 222–226.

10 Balkin, 2018a, pp. 989–990.

11 Holczer, 2007, pp. 92–98.

12 Kincsei, 2007, pp. 48–62.

media platforms are located between the state and the people. In this new algorithmic society, communication depends on the decisions of the owners of the private infrastructure, who control the digital space, i.e. the problem of private governance arises. These private companies control, censor and monitor communication on the platforms.<sup>13</sup>

In examining the human side, the literature highlights that humans have become vulnerable to technology, their personalities are split into real and virtual personalities, in many cases becoming monitored, controlled and controlled personalities. Human relations are mediated by objects, self-expression takes place through objects and, as part of networks, the information communicated can be deformed, its mechanism of action becoming uncontrollable and unmanageable.<sup>14</sup> New media applications are both a method of communication and a method of observation. They provide increasingly accurate ways of monitoring the behaviour of end-users and those who communicate with them. In what is seen in the literature as the great bargain of the twenty-first century, social media providers offer valuable services for free, in return for which they can collect, analyse and use end-user data to control users, and all this under digital privacy.<sup>15</sup>

The relationship between technological devices and people is defined in the literature by several theses. The first is that the impact of technology goes beyond its use and utility. A further important thesis is that the device is in relationship and interaction with the user. Technology also satisfies the desire for something different, for something newer, since tools are typically incomplete, evolving and offering the user future versions. This desire for newer devices also sustains the system of production and technological innovation and newer technology generates new demand from the user. Current development trends suggest that the technological world and human relations are becoming increasingly intertwined and complex.<sup>16</sup> The literature explicitly refers to the fact that we live in an information society, which is a new way of living together in society. Not only are technological innovations emerging, but social coexistence (habits, norms, culture) is changing as a consequence. The basis for these changes is made possible by information and communication technology. Networking is promoting globalisation and creating a global information society among those who participate in the network.<sup>17</sup>

---

<sup>13</sup> Balkin, 2018b, pp. 1150–1154.

<sup>14</sup> Csizmadia, 2019, pp. 63–68.

<sup>15</sup> Balkin, 2018a, pp. 991–994.

<sup>16</sup> Csizmadia, 2019, pp. 62–63.

<sup>17</sup> Pintér, 2007, pp. 21–26.

The information society<sup>18</sup> is transforming the world, with globalisation, networking and a global media culture being among its many important features.<sup>19</sup> The relationship between physical space and time is changing, with technology making it possible to bridge the physical space in the flow of information in a very short time. This will also help to reduce inequalities between spaces. Channels of globalisation and interconnectivity are emerging through the Internet, which strengthens social links and networks society. The Internet is strengthening network industries and multinational companies that respond to and serve social demand. A global digital economy has been built through technology that serves consumer needs at an increasingly higher level, which also encourages these companies to develop technology rapidly.<sup>20</sup>

In order to address the issues of legal regulation, it is necessary to understand the problems that arise in the context of the information society. The literature raises a number of these issues, of which I will highlight those that are relevant from a legal point of view. One issue is the level of organisation of the supranational level, the global information society. Other important issues are data protection and information security, the relationship between government and citizens, and future developments that will induce further changes (artificial intelligence, robots).<sup>21</sup> It is therefore important how law responds to these issues.<sup>22</sup> There is a literature that stresses the importance of the relationship between technology and law in terms of the problems that technology brings

---

18 Pintér, 2007b, pp. 213–246. The author points out that the concept of information society can be approached from different angles, and different concepts can be given depending on the perspective from which the concept is approached. In the technological sense, it refers to operations with information and knowledge and the associated infocommunication tools; in the social sense, it is characterised by a network society, communality, continuous adaptation, new forms of inequality and globalisation; in the development sense, it refers to a paradigm shift and a way of thinking; it can also be defined as an object of scientific study.

19 Zódi, 2018, pp. 36–39.

20 Kollányi, 2007, pp. 83–92.

21 Z. Karvalics, 2007, pp. 44–46. The author breaks down the issues of the information society into nine main areas. These areas are the global information society, sustainable information society (environmental problems), information society security (technology-related risks), space-oriented information society (impact of space exploration), electronic Orwellian world or digital Athens (new kind of dictatorship or new kind of democracy), smart city, corpus digitale (preservation of all human knowledge), creative information society, post-information society (future development).

22 Manwaring, 2017, p. 62. Among the innovation issues, the author highlights the variability and vulnerability of computing, the interaction between the physical world and cyberspace, the impact of digital objects and devices, electromobility, the relationship between humans and computers, the impact of autonomous and semi-autonomous devices.

to the forefront of social life that did not exist or were not relevant before. In many cases, the challenge for legal regulation is not the technology itself, but the way technology is used. Technology also means social relations between people, which are in a state of constant change, and therefore the problems associated with the development and use of technology are changing rapidly. People interact with technology and with each other. Technology thus triggers innovation in social and legal relations. Technology enters into an existing social and legal system and challenges and changes the traditional regulatory system, disrupting the functioning of traditional legal institutions, and requiring new responses to challenges.<sup>23</sup> A particularly important factor is the issue of technological governance, where modern technologies are often used as a regulatory tool instead of legal rules. Through technology governance, certain actions or people are excluded from technologically regulated activities by automating processes. However, this techno-regulation raises many problems, for example, it may violate legal freedoms. At the same time, technologies are also generally considered in the literature to have a disruptive effect, as they disrupt the existing regulatory order.<sup>24</sup>

The theory also seeks answers to the questions raised. The literature divides theories on information society governance into three groups. One of these is the question of jurisdiction. The example of the Internet shows that in some cases no single state has exclusive jurisdiction over a given technology. This view emphasised that, without state intervention (e.g. the Internet), users themselves shape the rules of operation, the ethical rules. However, self-regulation is inadequate to address the problems at hand. The use of technology was not separate from the existing social reality and therefore could not be treated as a 'rights-free space'. Existing social norms must be taken into account, the relevant legal regulation of which already exists. The other view is that technology is a specific subject of regulation and that, accordingly, a completely new regulation needs to be developed. Thirdly, the theory of integrated regulation has been developed and put into practice. In other words, it is not necessary to develop a completely new regulatory framework, but rather to extend the existing regulatory framework to the new technology. This does not mean that new concepts do not need to be created, but that the legal instruments are available and can largely be applied to the social conditions changed by technology.<sup>25</sup>

*Ex ante* and *ex post* regulation is an important issue in relation to legal regulation. The literature emphasises that *ex ante* regulation is difficult in the case of

---

23 Balkin, 2015, pp. 46–55.

24 Brownsword, 2015, pp. 1–51.

25 Simon, 2007, pp. 114–118.

technology, since it is a new regulatory area and there are unknown situations to be considered. Excessive *ex ante* regulation can hamper technological development and lead to poor solutions. *Ex post* regulation allows the legislator to know the subject matter of the regulation and the life situations to be regulated and to intervene only where and to the extent necessary.<sup>26</sup> However, too late regulation carries the risk that the legislator loses control of the technology and may create confusion in the application of the law.<sup>27</sup>

The law also must face up to a number of specificities arising from the nature of the technology which may give rise to regulatory anomalies. One such problem is the issue of regulatory gaps, where uncertainty about technology can lead, for example, to the emergence of a relatively new, unknown technology and where even science cannot precisely define and describe the technology. The other area is connected to the problems regarding the application of existing regulation. A major challenge before the law in force is to integrate new areas of regulation into the current regulatory environment. If the law captures and describes the technology incorrectly, the regulation will be incorrect and imprecise. Another problem is the scope, impact and use of technology. Furthermore, deviations from the model predicted and assumed by the law can also cause confusion in the regulatory environment. The issue of over- or under-regulation may also arise. Both can be a problem in the economic and social functioning and interaction of technology. Finally, it is important to highlight the rapid regulatory obsolescence. The law changes slower than technology and the social and economic conditions that it creates.<sup>28</sup>

It is therefore clear that there is a conflict between law and technological progress. One of the main problems with technology is uncertainty. How will the novelty affect social relations, what will be the result of this and its application, how will social relations affect the technology itself? Law tries to manage these risks, to protect human rights against technology. This may even lead to the law restricting the use of the technology until it is proven that it is safe and conforms to the prior norms set by the law. The dilemma therefore arises of whether to regulate quickly but less optimally, or to regulate slowly but judiciously, waiting for social and economic conditions to evolve.<sup>29</sup>

The literature also points out that for a time, the traditional instruments of law were able to keep pace with technological change by incorporating and supplementing the emerging regulatory issues into the traditional regulatory

---

<sup>26</sup> Simon, 2007, p. 115.

<sup>27</sup> Nagy, 2018, p. 38.

<sup>28</sup> Butenko and Larouche, 2015, pp. 66–68.

<sup>29</sup> Tóth-Klein, 2018, pp. 30–32.

system. However, in recent decades, further problems have emerged. One of these problems is the diffusion of technology. With the spread of information technology, much more profound changes are taking place than experts thought in the early years of its diffusion. And qualitative changes have forced law to intervene in social relations in a stronger way. This can take place at two levels: the legislature and the application of the law. Of these two, it is the application of the law that is likely to be slower to adapt, since it is here that changes in the traditional application of the law are needed, even generating differences in perception between generations of jurists.<sup>30</sup>

The literature breaks down the problematic field for law based on technology into three main areas. Platforms, robots and artificial intelligence, and Big Data. Horizontal and vertical platforms, which become ‘online living spaces’, act as a kind of ‘digital utility’.<sup>31</sup> The characteristics of the Internet have a fundamental impact on the potential for legal problems to arise. These include openness, multimodality, interactivity, digital nature, convergence, decentralisation, globalisation, anonymity, lack of control and continuous technological development. The Internet is an open network to which anyone can connect, and which allows the downloading and transmission of multimedia content. At the same time, it is also a digital repository for content, thus increasingly integrating multimedia, communication and computing. It is also a decentralised network that can operate without control, spanning the whole world and providing a degree of anonymity for the user.<sup>32</sup> However, it also seems that platforms are forced to self-regulate and censor themselves because of corporate responsibility and economic reasons. The platforms moderate hate content and allow users to filter unwanted content, showing corporate responsibility towards users and at the same time limiting full freedom of expression. But in addition to the noble objective, there is another reason why platforms are influenced, and that is economic. If users are turned off by hateful, violent content, this threatens advertising revenue and the profits that could be made from it. If the platform better meets

---

<sup>30</sup> Zódi, 2017.

<sup>31</sup> Zódi, 2017, p. 28. In the other cited work, the author clarifies the issue of horizontal and vertical platforms (Zódi, 2018, pp. 101–103 and pp. 165–167). By horizontal platforms he means websites that connect people and other resources through algorithm-driven data flows and that have a sufficiently large number of users connected to them to measure their social impact (e.g. Google, Facebook). Vertical platforms are understood as enterprises that enable value-creating interactions, facilitate economic activity, act as a kind of virtual marketplace (sharing economy, e.g. UBER).

<sup>32</sup> Nagy, 2004, pp. 58–61. The author points out that anonymity is apparently present because the computer logs our searches, and service providers also collect data about the user and the computer can be used to trace the user.

users' needs and preferences, then users will visit more regularly and there will be more advertising opportunities. A balance must therefore be found between ensuring freedom of expression and hate content. In this sense, platforms play the leading role.<sup>33</sup> A commitment to digital citizenship requires ensuring robust and responsible participation in the online space. However, the proliferation of hate speech requires more complex solutions. The literature highlights three such areas, such as removing hate content; countering hate speech with counter speech; online dialogue and the education of users. The first solution is considered the most effective, but also the most powerful tool, by blocking the content or terminating the user account. In the second case, a milder tool is used, i.e. creating a dialogue, refuting the comments. Thirdly, as a means of education, platforms can inform users about the standards they apply, the content they remove and the reasons for their removal.<sup>34</sup>

All these legal issues are also of great relevance to our book. Jurisdiction, competition, fundamental rights and data protection issues arise in the case of horizontal platforms. In the area of jurisdiction, the question arises: how national regulation can regulate activity in a global, non-national, transnational space? National regulators are ineffective or have little or no influence in this area. Competition issues arise because of the small number of market operators. The specificity of the network industry itself results in a monopoly of service providers, with users flowing to one provider as a self-expanding process. However, the 'monopoly situation' is not limited to one country but extends to the whole world. This situation is exploited by operators from economic and other points of view. The question arises whether the service provider only gives the customers the possibility to do and post anything they want on the internet or whether they have to control the content. Where is the limit and under what law does the service provider do this, can the content be checked under the internal rules applicable to a private company? The literature also points to the important regulatory and legal interpretation issues that emerge in this area. A platform-related issue is digital data storage and use. This is also a fundamental rights issue, which falls under data protection.<sup>35</sup>

There are also significant legal dilemmas in the other two areas. Vertical platforms operate as a business model, a kind of 'virtual marketplace'. The sharing economy<sup>36</sup> is a service sector using innovative digital solutions, which causes problems in several legal areas such as competition law (violation of industry

---

<sup>33</sup> Klonick, 2018, pp. 620–629.

<sup>34</sup> Citron and Norton, 2011, pp. 1471–1491.

<sup>35</sup> Zódi, 2017, pp. 27–29.

<sup>36</sup> Nagy, 2016, pp. 1–7.

rules), consumer protection (exclusion of liability), labour law (forced employment, hidden employment contracts), tax law (tax avoidance), among others.

A more complex issue is artificial intelligence and robots. Even in jurisprudence, there are divergent views on the provision and legal recognition of electronic identity. Is it an autonomous entity that makes autonomous decisions or is it just a programmed object that carries out the programmer's commands? Several questions arise in relation to damages and compulsory liability insurance.<sup>37</sup>

The European Union is also looking for answers to technological challenges, which need to be addressed through legislation. In addition to defining four main strands, economy, infrastructure, governance and expertise, digital citizenship is at the heart of the question of rights and principles for digital development. These principles will be translated into rights and become part of national legislation. These principles include people-centredness, freedom of choice, safety and security, maintainability, participation, solidarity and inclusiveness. Protecting the rights of individuals, a fair online environment, protection against illegal and harmful content, and ensuring the security of the digital environment are therefore important issues. Internet access for all, digital infrastructure and digital public services are priorities. Many of the digital rights are not new rights but complement existing rights.<sup>38</sup> EU legislation has developed along these lines, through the Digital Service Act (DSA) and the Digital Markets Act (DMA). The DSA is seen by the EU as platform regulation, as the previous rules were outdated and not suited to deal with modern changes. This regulatory crisis has been resolved by the new regulation.<sup>39</sup> Indeed, the EU has also acted as a model regulator to address the regulation of artificial intelligence. At the time of writing, this has not yet been adopted, but it is a forward-looking initiative in many respects. The European Union has set a fundamental objective to ensure that the reliable, safe development and use of AI is carried out in accordance with fundamental rights, and that innovation is accompanied by human-centred technology.

This brief overview shows that law is constantly facing new challenges as technology changes, and the number of challenges will only increase in the coming decades. Members of society see only the great freedom and the expanding digital space and opportunities offered by technology and are not alert to the

---

37 Zódi, 2018, pp. 28–71.

38 *Europe's Digital Decade: digital targets for 2030* [Online]. Available at: [https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030\\_hu](https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_hu).

39 Zódi, 2023, pp. 181–201.

dangers inherent in this. When infringements occur, however, people immediately expect the state to provide legal protection, even though they may have previously refused to legislate in this area. The use of technology does not improve basic human qualities or human relationships, but only transfers them into a digital space. The law is constantly shaping the rules in response to problems, but there is clearly an inherent slowness of reaction time in lawmaking that cannot be eliminated if the legislator is to act in spirit of democratic norms and prudence. In comparison, service providers can change internal rules more quickly, even on the basis of external government regulation – but is this the right practice? However, in my opinion, the task of incomplete regulation cannot be left entirely to the service provider. It would be better to develop a more flexible legal regulatory regime involving providers who are more familiar with the technology. In any case, these are challenges that both practitioners and academics need to be prepared for.

## Bibliography

- Balkin, J. M. (2015) 'The Path of Robotics Law', *California Law Review Circuit*, 2015/6, pp. 45–60.
- Balkin, J. M. (2018a) 'The First Amendment in the Second Gilded Age', *Buffalo Law Review*, 66(5), pp. 979–1013.
- Balkin, J. M. (2018b) 'Free Speech in the Algorithmic Society: big data, private governance, and new school speech regulation', *U.C. Davis Law Review*, 51(3), pp. 1149–1210; <https://doi.org/10.2139/ssrn.3038939>.
- Bell, D. (2001) 'The social framework of the information society', *Information Society*, 1(1), pp. 3–33.
- Brownsword, R. (2015) 'In the Year 2061: From Law to Technical Management', *Law, Innovation and Technology*, 7(1), pp. 1–51; <https://doi.org/10.1080/17579961.2015.1052642>.
- Butenko, A., Larouche, P. (2015) 'Regulation for innovativeness or regulation of innovation', *Law, Innovation and Technology*, 7(1), pp. 52–82; <https://doi.org/10.1080/17579961.2015.1052643>.
- Citron, D. K., Norton, H. (2011) 'Intermediaries and Hate Speech: Fostering Digital Citizenship for Our Information Age', *Boston University Law Review*, 91(4), pp. 1435–1484.
- Csizmadia, Z. (2019) Az autonóm, önvezető technológiák elterjedésének társadalmi következményei – kérdések, dilemmák és szempontok', *Tér – Gazdaság – Ember*, 6(1), pp. 59–85.
- Fülep, I., Nick, G., Várgedő, T. (2018) 'Zászlón a digitalizáció – Ipar 4.0', *Új Magyar Közigazgatás*, 11(2), pp. 45–55.
- Harari, Y. N. (2017) *Sapiens – Az emberiség rövid története*. 2nd edn. Budapest: Animus.
- Holczer, M. (2007) 'Innovációs verseny az információs társadalomban' in Pintér, R. (szerk.) *Az információs társadalom*. Budapest: Gondolat-Új Mandátum, pp. 94–113.
- Kincsei, A. (2007) 'Technológia és társadalom az információ korában' in Pintér, R. (szerk.) *Az információs társadalom*. Budapest: Gondolat-Új Mandátum, pp. 47–63.
- Klonick, K. 'The New Governors – The People, Rules, and Process Governing Online Speech', *Harvard Law Review*, 131(6), pp. 1598–1670.
- Mankiw, N. G. (2005) *Makroökonómia*. Budapest: Osiris.
- Manwaring, K. (2017) 'Kickstarting Reconnection: An Approach to Legal Problems Arising from Emerging Technologies', *Deakin Law Review*, 22(1), pp. 53–84; <https://doi.org/10.21153/dlr2017vol22no1art722>.
- Mishkin, F. S. (2015) *Makroökonómia*. Budapest: Alinea.

- Nagy, D. (2004) 'Az internet és a jog', *Információs Társadalom* 1.sz, pp. 58–68; <https://doi.org/10.22503/inftars.IV.2004.1.4>.
- Nagy, Z. (2016) 'A közösségi gazdaság (Sharing Economy) és pénzügyi szabályozása' in Kékesi Tamás (szerk.) *The Publicationes of the MultiScience – XXX. microCAD International Multidisciplinary Scientific Conference*. Miskolc: University of Miskolc, pp. 1–7; <https://doi.org/10.26649/musci.2016.121>.
- Nagy, Z. A. (2018) 'A jövő tegnap óta tart- A modern Technikai-technológiai folyamatok kihívásai a jog területén', *Belügyi Szemle*, 66(10), pp. 36–55; <https://doi.org/10.38146/BSZ.2018.10.3>.
- Pintér, R. (2007a) 'Úton az információs társadalom megismerése felé' in Pintér, R. (szerk.) *Az információs társadalom*. Budapest: Gondolat-Új Mandátum, pp. 11–28.
- Pintér, R. (2007b) 'Divatos hívószavak, nagy elméletek, fejlesztési szupernarratívák és metanarratívák – Az információs társadalom jelentésvilága' in Pintér, R. (szerk.) *Az információs társadalom*. Budapest: Gondolat-Új Mandátum, pp. 212–223.
- Reese, B. (2020) *A negyedik kor – Okos robotok, tudatos számítógépek és az emberiség jövője*. Budapest: Typotex.
- Samuelson, P. A., Nordhaus, W. D. (2012) *Közgazdaságtan*. Budapest: Akadémiai Kiadó.
- Simon, É. (2007) 'Bevezetés az információs társadalom jogi szabályozásába' in Pintér, R. (szerk.) *Az információs társadalom*. Budapest: Gondolat-Új Mandátum, pp. 114–129.
- Tóth, A, Klein, T. (2018) 'Technológia és robotjog' in Tóth, A. (szerk.) *Az infokommunikációs és technológiai jog alapjai*. Budapest: NKE, pp. 30–45.
- Z. Karvalics, L. (2007) 'Információs társadalom-mi az? Egy kifejezés jelentése, története és fogalomkörnyezete' in Pintér, R. (szerk.) *Az információs társadalom*. Budapest: Gondolat-Új Mandátum, pp. 29–46.
- Zódi, Zs. (2018) *Platformok, robotok és a jog*. Budapest: Gondolat Kiadó
- Zódi, Zs. (2017) 'Az információs társadalom legújabb kihívásai a jog számára', *Gazdaság és Jog*, 2017/9, pp. 27–30.
- Zódi, Zs. (2023) *Platformjog*. Budapest: Ludovika.