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FINTECH REGULATION IN HUNGARY

*Tibor Tajti**

1. Introduction: On the Limits and Structure of the Paper

The goal of this paper is modest: it only aims to sketch what has happened in the last few years in the country in the realms of legal- and Fin-tech, including the responses of the legal profession, from legal education to the pertaining publication records of Hungarian legal scholars. As it will be showed, Hungarian legal scholars are increasingly sensitive to everything that 'law and technology' denotes and have picked up the technology-created gauntlet and compared to its size, non-negligible developments could be heralded upon already now. As it will be seen, what one could talk of is (if not only) that Hungary could be pointed at to illustrate that "the Bitcoin Blockchain currently uses more electricity

* The author would like to express his gratitude for the exchanges related to this paper to Andrea Kozma (Director of CEU InnovationsLab, the Business incubator of the Central European University), Pál Takács and Márton Horányi from the law firm Baker & McKenzie (Hungary), Gergely Szalóki from the law firm Schönherr, Miklós Orbán from the law firm OPL (Orban & Perlaki), as well as assistant professor Asress Adimi Gikay (Brunel University, London, UK).

than Hungary"[1] or that Nick Szabo – the 'early proponent of smart contracts'[2] – and Thomas Peterffy, "the Hungarian who invented not one but two things crucial to financial markets today: one of the first computer programs to price options, and high-speed trading"[3], are of Hungarian origin. In fact, some Hungarian ventures exploiting technology, some directly or indirectly exploitable by the legal profession as well, have already gained wide international reputation; like the power-point rival PREZI[4] or the Facebook messenger-marketing developer RECART[5].

The paper is structured as follows. *First*, the socio-economic environment and the various empirical developments are briefly presented, including various private and governmental initiatives and projects focusing on legal tech and fintech. This is important because law and regulation, and to a great extent also legal scholarship, cannot isolate itself from the general environment. These *a priori* affect how technology is impacting the life of Hungarians and the legal profession; including legal education and legal scholarship. *Then* it will be attempted to provide the reader with a synopsis of the related regulatory framework, *to be followed by* a look at the key publications having appeared in the field. *Last but not least*, the first Hungarian court case involving a bitcoin fraud and the findings of the linked expert opinion summarized in the format of a law review article is to conclude the review.

A note on the limitations of the paper need to be added as well. Namely, law and technology has come within the purview of lawyers only more recently though publications, court cases on earlier technological developments of earlier vintage do exist as well, though only in modest numbers.

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[1] J. Abadi – M. Brunnermeier, *Blockchain Economics*, National Bureau of Economic Research (NBER) Working Paper 25407 (Cambridge, Massachusetts, Dec. 2018), 11, *https://www.nber.org/papers/w25407.pdf*.

[2] See P. Franco, *Understanding Bitcoin: Cryptography, Engineering and Economics* (New Jersey, 2015), at 165.

[3] See socializing finance a blog on the social studies of finance 'Automated and high-speed trading: invented by a Hungarian on Wall Street' (June 25, 2013), <*https://socfinance.wordpress.com/2013/06/25/automated-and-high-speed-trading-invented-by-a-hungarian-on-wall-street/*>. See also the book by C. Steiner, *Automate This: How Algorithms Came to Rule Our World* (London-UK, 2012) on the life of Peterffy.

[4] See the English language website of PREZI at *https://prezi.com*.

[5] For the Recart story see the 2019 June issue of Forbes-Hungary. The title of a more recent Forbes-Hungary article by S. Krisztián (3 Oct. 2019 issue) might also be telling on the success of this initially Hungarian team: *Exkluzív: 3 millió dollárral zárta induló befektetési körét a Facebbok kedvenc magyar startupja* [Exclusive News: the Favorite Hungarian Start-Up of Facebook Closed its Initial Investment Round with 3 Million Dollars].

Consequently, the related scholarship is far from being abundant. This applies especially to the latest-generation developments, where publications from under the pen of various industries are the ones that pave the way to legal scholars regularly joining only with some delay. Yet relative to its size, the developments (as far as the Hungarian language publications are concerned) place Hungary in the group of countries that could be best described as modest yet promising legal- and fin-tech systems.

2. The Hungarian Socio-Economic Environment: An Eclectic Rundown

2.1. Private Initiatives

Quite a few interesting private initiatives have seen the daylight by now in Hungary; otherwise the country where John Neumann, the father of computers was born as well. The initiatives, some informal others more formal, are myriad, different yet linked with the common interest in the technology-law interface[6]. On some fronts significant advancements have been made yet in respect of the others country is only a follower learning the secrets of the field with a piecemeal tempo. Consequently, one could find very little about crypto hedge funds or smart contracts-based systems though what Blockchain means and how it functions is quite widely discussed and published on.

For example, ARSBONI is a community of lawyers interested exactly in how technology is changing the legal profession, with regularly published blogs, writing contests[7].

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[6] E.g., there was an international conference on Blockchain on 8-9 Nov. 2018 in Budapest (in the building called 'the Whale') (*https://blockchainbudapest.com/*).

[7] For the Hungarian language webpage of the group see *https://arsboni.hu/magunkrol/*. A selection of papers having appeared under the auspices of Arsboni is a good indicator of the association's activity: *https://arsboni.hu/blockchain-integralasa-hazai-jogrendszerbe/* [Integration of Blockchain into the Domestic Legal System]; *https://arsboni.hu/a-bitcoin-jogi-helyzete-napjaink-penzugyi-vilagaban/* [The Position of Bitcoin in the Contemporary Financial World]; *https://arsboni.hu/kozossegi-finanszirozas-mint-magyar-innovacio-jovoje/* [Peer-to-peer Financing as the Future of Hungarian Innovation]; *https://arsboni.hu/miert-folyik-a-csapbol-is-a-lawtech/* [Why is Fintech Flowing even from Taps?]; *https://arsboni.hu/mi-a-lawtech-realitas-magyarorszagon/* [Lawtech and Reality: the Case of Hungary]; *https://arsboni.hu/az-insurtech-hazai-zaszloshajoja/* [The Beacon of Domestic Insurtech]; and *https://arsboni.hu/felforgato-vagy-fenntarto-innovacio-avagy-a-fintech-bankrendszerre-gyakorolt-hatasai/* [Disrupting or Supporting Innovation or Fintech's Impact on the Domestic Banking System].

Fintechzone[8] goes broader as it collects publications on the application of technology in the financial sphere yet with a focus not limited to law. Law firms have as well joined the line with organizing more and more events devoted to various novelties affecting the legal profession thanks to technology[9]. Needless to say, other associations involving lawyers have joined the trend by including the 'tech-prong' into their activities, from the Association of 'Hungarian Professors for an European Hungary'[10] through the junior lawyers' commission of the Hungarian Lawyers' Society (*Magyar Jogász Egylet Ifjúsági Bizottsága*)[11].

2.2. Educational Institutions-Linked Initiatives

The Innovations Lab of CEU[12] (Central European University) seated in the very center of the capital Budapest is not focused on law but on nurturing genuine, real-life, start-up ventures many exploiting various technologies, from novel chatbot platforms to pan-European 'broker-chooser' possibilities[13]. It already has noticeable achievements, such as having been named as the 'best acceleration and incubation program in Hungary' by CESAWARDS in 2017[14]. It can be proud of also of the successes some of its start-up teams[15].

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[8] See the Hungarian language website of the initiative at *https://fintechzone.hu/rolunk/*.

[9] E.g., the law firm 'Réti, Várszegi és Társai' organized a conference on the theme of 'the Evolution of Artificial Intelligence' in cooperation with the French and German embassies in Budapest on 17 May 2019. See *https://www.retivarszegipartners.hu/a-mesterseges-intelligencia-fejlodese-jelentette-kihivasok/*.

[10] See, e.g., the conference paper of B. Zuti, *Digitalizáció, felsőoktatás és regionális versenyképesség* [Digitalization, Higher Education and Regional Competitiveness] presented at the XVIth PHD conference held in Budapest, on 11 Apr. 2018, *http://real.mtak.hu/80802/1/Zuti_Bence_Digitalizacio_felsooktatas_es_regionalis_versenykepesseg.pdf*.

[11] The junior lawyers organized, for example, a conference on 'Artificial Intelligence and the Law' on 28th of November 2019.

[12] See the English language website of the Lab at *http://ilab.ceu.edu/*

[13] See, e.g., *https://www.forbes.com/sites/alisoncoleman/2019/02/21/why-budapest-is-the-go-to-city-for-entrepreneurs/?fbclid=IwAR0b-Z75K26I49kzJB74AM4hwqpGua3O2d2NjmBfufKiNzOZ5A6NR-EpRf8#11a4cf153772and https://www.forbes.com/sites/jeanbaptiste/2019/02/11/startup-grind-conference-19-startups-to-watch/?fbclid=IwAR0Rw5vHg4oERQBqS-Qm6tHwfKlOC8xj2AXnxFgJyG8tPZBhn6ZjNxvRMxs#8bf888d40156*.

[14] The website of Central European Startup Awards is at *http://centraleuropeanstartupawards.com/categories*.

[15] See, for example, Brokerchooser at *https://brokerchooser.com/* or the start-up team 'Talk-A-Bot' that developed client needs-fitting chat-bots that could be individually owned. On the latter see the related Hungarian language column of Gergő Zsiborás, *(segue)*

As opposed to the above, the Fintech Center[16] of the Economics-focused Budapest-based Corvinus University[17] has become known during the last few years because of its unprecedentedly popular public talks and workshops devoted to Blockchain technology[18]; yet again not limited only to its exploitation by the legal profession. Some members of the faculty of Corvinus have related publications as well, including joint publications with international teams of experts[19].

Not unsurprisingly, courses directly targeting, or touching upon, new technologies are increasingly offered not only by engineering or computer science[20] but also by law schools; though not all of them. Yet it would be mistaken to speak of major advancements as of yet. For example, while the University of the city of Győr in western Hungary set out by erecting merely an inter-active digital center named as 'MobillTy,'[21] the National University of Public Service runs no less than eight projects devoted to various aspects of law and technology[22]; presumably a too ambi-tious project if adjudged based on the size of its faculty and especially its main profile and focus areas. Needless to say, the first theses (basic-level, master's and doctoral) on various touching points of law and technology began to appear[23].

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the columnist of FORBES-Hungary, 5 Dec. 2016 issue. Not all teams focus though on technology: Absorice – a producer of gluten free, lactose free and vegan protein mixes and bars – attracted the interest of Cerbona, the leading Hungarian producer of cereal products. [See *https://cerbona.com/en/brand-en/*].

[16] See the Hungarian language website of the Center at *http://fintech.uni-corvinus.hu/*

[17] See the English pages of Corvinus at *http://portal.uni-corvinus.hu/index.php?id=44609*

[18] See for example *http://ivsz.hu/esemenyek/corvinus-fintech-workshop/*

[19] See, e.g., the publication of Tuan Anh Trinh (Corvinus faculty) *Resilience and Fault Tolerance* (Ultrascale Computing Systems, Jan. 2019) written together with a team made of Pascal Bouvry, Sebastien Varrette, Muhammad Umer Wasim, Abdallah A. Ibrahim and Xavier Besseron, or Chapter 6 on Green Data Centers in: Jean-Marc Pierson, *Large-Scale Distributed Systems and Energy Efficiency – A Holistic View* (New Jersey, 2015).

[20] See, for example, the Budapest-based ELTE University Bitcoin project description in English at *http://www.vo.elte.hu/bitcoin/#*

[21] See the related webpage at <*http://mobilis-gyor.hu/rolunk*>.

[22] For the related Hungarian-language page see *https://itki.uni-nke.hu/kutatasi-projektek*. The projects seem to be very (too?) ambitious and include projects like 'the regulatory perspectives of algorithmic decision-making' [algoritmizált döntéshozatal szabályozási perpektívái] or 'liability questions on the Internet' [felelősségi kérdések a világhálón]. *Id.*

[23] See, for example, E. Dániel, *A World of Warcraft-tól a Bitcoin-ig: Az egyén, a gazdaság és a tulajdon helyzetének magán-és büntetőjogi elemzése a virtuális közösségekben* [From

(segue)

2.3. The Banking Sector

Inspired, or rather pressed, by western commercial banks' experiments with application of Blockchain, this technology has not bypassed Hungarian bank either[24]. Hungary has joined main European trends even if sometimes with delays and with more modest means than in the West. The publicly available information does suggest that, indeed, banks are experimenting with all the major more recent technologies and some have been intro-duced; yet banks remain relatively conservative as financial organization normally are not aggressive in introducing novelties[25]. Exceptions could also be found[26].

2.4. Governmental Projects and Initiatives

Reactions from the side of some governmental institutions ensued as well, like the Fintech Consultation study of the Hungarian National Bank (MNB) in 2017[27] and the MNB warnings on the risks corollary to trading in cryptocurrencies in three consecutive years of 2014, 2015 and 2016[28]. In fact, as far as Fintech is concerned, given the dilemmas corollary to all the innovations, the publications of the MNB, including its press releases and other types of communication are the sources that have to be consulted in Hungary. Mention ought to be made also of the Financial and Economic

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the World of Warcraft to Bitcoin: The Analysis of the Individual, the Economy and Ownership in the Virtual World from the Perspectives of Private and Criminal Law] (2015, submitted to the Law School of Pecs); M. Kövér, *A mesterséges intelligencia alkalmazása a pénzügyi szolgáltatásokban* [The Use of Artificial Intelligence in Financial Servies] (Corvinus Economics University, Budapest, 2019).

[24] See, for example, the Fintechlab of the Hungarian MKB Bank at *https://fintechlab.hu/*.

[25] For a sketch of Fintech developments in Hungary see E. Papp, *Fintech in Hungary: An Overview*, in *Practical Law Country Q&A*, w-014-8688 (2019). According to this report the following technologies are applied, or at least their introduction is planned, in Hungary: Mobile payments solutions; Account information services and payment initiation services (Article 4(15) and (16), PSD2); PFM; Robo-advising; Social scoring; Electronic money; InsurTech; Blockchain and Crowdfunding.

[26] MKB Bank, the fourth largest Hungarian bank, for example, has invested in the cryptocurrency wallet Amon. The Bank will acquire 3% equity in the project. See Cryptoninjas.net, Fourth Biggest Hungarian Bank MKB Invests in Cryptocurrency Wallet Amon (15 Febr. 2019), *https://www.cryptoninjas.net/2019/02/05/fourth-biggest-hungarian-bank-mkb-invests-in-cryptocurrency-wallet-amon/*

[27] The English language document Innovation and Stability Overview of Fintech in Hungary can be downloaded from *https://www.mnb.hu/letoltes/consultation-document.pdf*

[28] See, e.g., US Library of Congress database 'Regulation of Cryptocurrency around the World' at *https://www.loc.gov/law/help/cryptocurrency/world-survey.php#hungary*

Review ("*Hitelintézeti Szemle*")[29] containing also Fintech- related studies. The journal is run by the MNB since 2014, when it was taken over from the Hungarian Banking Association in order to promote financial education in the country.

Of special relevance is, however, the 2017 Regulatory Sandbox ("*Innovációs Pénzügyi Tesztkörnyezet*") initiative of the Hungarian National Bank (MNB)[30], which aims to foster Fintech innovation and its use through providing a regulator-friendly testing period; a chance to test new products under supervision of the MNB and free from most of the regulatory constraints[31]. The applicants, after identification testing, may test their new technology-based services for the initial period of twelve months, that could be prolonged for maximum six additional months.

If one would like to look for a branch of law where new technology is already being applied thanks to governmental support and involvement, one could mention insolvency law. In this context, an electronic system for selling the assets of a bankrupt debtor in liquidation proceedings was introduced in 2014, where the debtor's assets are to be sold via the internet to increase transparency of auctions and [hopefully] to achieve higher sales prices[32]. Earlier, in 2010, the selection of insolvency administrators was changed to an electronic selection system[33].

Part of the story is that in 2019 the right-wing Hungarian government launched as well a program proclaiming, as the related website announces, that "each and every citizen and enterprise of the country would win from digitalization"[34]. The increased emphasis on technology was unfortunately followed also by the reigning in of the Hungarian Academy of Sciences by grabbing the control over it through a series of radical unilaterally

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[29] The website of the journal is at *https://hitelintezetiszemle.mnb.hu/*

[30] See, e.g., *https://www.mnb.hu/innovation-hub/hirek/az-mnb-a-regioban-az-elsok-kozott-regulatory-sandbox-reven-tamogatja-a-penzugyi-szektor-innovacioit*

[31] The Sandbox is regulated by the MNBs decree No. 47/2018 (as of Dec. 17th) [*47/2018. (XII. 17.) MNB rendelet egyes MNB rendeletek szerinti kötelezettségeknek való megfelelés eltérő szabályairól*].

[32] The new system was introduced by Governmental Order No. 17/2014 (as of Febr. 3) on sale of debtor's assets in liquidation proceedings electronically (*17/2014 [II. 3] kormány rendelet a felszámolási eljárásban az adós vagyontárgyainak elektronikus értékesítéséről*).

[33] The new system was introduced by the Order of the Ministry of Justice and Interior No. 36/2010 (as of May 13th) on the rules of the electronic appointment of liquidators, property-administrators and temporary property-administrators.

[34] For the Hungarian language pages of the initiative see *https://digitalisjolet program.hu/hu/rolunk*.

taken steps. While the official narrative was redirection of research focus towards everything that is technology, in the eyes of the political opposition and much of the Hungarian academic community, this was rather about gaining control over the world of academy and the linked finances. At the time of writing this paper it is too early to speak about any genuine achievements as far as technology is concerned[35].

The projects and the strong (though often selective) support of the government notwithstanding, the general opinion of foreign experts being present on the Hungarian market is that the country is lagging behind developments. As Deloitte put it concerning Blockchain technology: 'Hungary is a few steps behind'[36].

3. Legal Tech

Hungary is a typical Continental European legal system, with a comparably small market of legal services dominated by small law offices though several larger law firms are also present; some operating in cooperation with global law firms. Hard to tell yet perhaps the internationally-linked ones are in a better position to access the ever-newer generations of legal tech products; like the apps used by the law firm Hegymegi-Barakonyi and Partner Baker & McKenzie Attorneys-at-Law (the Hungarian affiliate of the international law firm Baker & McKenzie). The otherwise globally used apps of Baker & McKenzie include the following: the 'global dawn raid app'[37]; 'Contract Express'[38], 'Connected Compliance'[39], 'GMAP'[40], 'Relativity Platform' for forensic review (eDiscovery technology)[41], and

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[35] See, e.g., the article of the Hungarian News Agency (MTI), *Govt Plan to "Reorganise" Academy of Sciences Triggers Protest*, 12 Febr. 2019, *https://hungarytoday.hu/govt-plan-to-reorganise-academy-of-sciences-triggers-protest*.

[36] See the findings of a Deloitte survey in B. Gaál, *Hungary a Few Steps behind in Blockchain Tech* (14 Jan. 2019), *https://bbj.hu/analysis/cee-hungary-a-few-steps-behind-in-blockchain-tech-deloitte_159963*.

[37] See the description at *https://www.bakermckenzie.com/en/insight/publications/2017/04/dawn-raid*

[38] See the description of the app at *https://watch.bakermckenzie.com/embed?id=0e9d4fb8-01bc-458e-8817-3b6a68718ffb*

[39] See the description of the app at *https://connectedcompliance.bakermckenzie.com/*

[40] See the description of the app at *https://www.bakermckenzie.com/en/insight/publications/2015/12/global-merger-analysis-platform-gmap/*

[41] See on the app *https://www.legalsupportnetwork.co.uk/technology/news/baker-mckenzie-first-roll-out-machine-learning-technology-global-scale*

'Contraxsuite'[42]. Individual attorneys are likewise eager to catch up, to a great extent because of the realization that technology increasingly impacts the legal profession. The Budapest affiliate office of the Vienna-based law firm Schöenherr, given the different profile, exploits other types of applications, like Citrix[43], JurXpert[44], Carpe Diem[45], or Legito[46].

4. The Regulatory and Scholarly Responses

4.1. Legal Scholarship

With the intensification of the impact of technology on our life – including law – and thanks to the spreading of internet and various forms of social media inevitably making this process more visible in the society, publications have begun to appear on the market as well. Some genuinely enriching the fledgling scholarship though so far primarily summarizing and synthetizing the research results available globally. In this respect, and compared to the relative size of the country, the more recent publications do deserve commendation. Yet a book that would specifically be focused on Hungary, attempting to position the country in terms of both technological advancements as well as the linked legal scholarship, is still lacking. This in some sense reflects the true state of affairs on the ground that could hardly be described but as compartmentalized, hectic and the law lagging behind.

Three recent publications ought to be mentioned, each published in Hungarian language.

Shorter and written to the general public rather than to lawyers yet providing the reader with a fair overview of most of the questions surrounding cryptocurrencies is a 2019 book, from under the pen of five authors (not only lawyers), titled 'the ABC of Cryptocurrencies' (*Kryptopénz ABC*)[47]. It covers the history of cryptocurrencies, Blockchain technology together with mining and trading cryptocurrencies, as well as the effects of these on the economy and critique.

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[42] See the description of the app at *https://www.bakermckenzie.com/en/newsroom/2018/07/lexpredict*

[43] See the description of the app at *https://www.citrix.com*

[44] See the description of the app at *https://www.x-bs.at/produkte/jurxpert*

[45] See the description of the app at *https://www.tikit.com/solutions/practice-case-management/tikit-carpe-diem/*

[46] See the description of the app at *https://www.legito.com/US/en/*

[47] A. Győrfi – A. Léderer – F. Paluska – G. Pataki – T. Anh Trinh, *Kryptopénz ABC* (Budapest, 2019).

As opposed to that, the book '*Technology, Robot and Cyber Law'* by Klein & Tóth[48] is a detailed, highly technical book written with focus on law and the regulatory environment; again, less on Hungary and more on the global and European developments. The book divided into the three parts figuring also in the title extends then also to data protection, Blockchain, cloud computing, platforms, electronic commerce, together with the competition and consumer protection law aspects of these as well as cybercrimes. The focus of the monograph of Zsolt Ződi from 2018 '*Platforms, Robots and the Law'*[49] is similar though perhaps with more attention devoted to big data and platforms. Books are coming out also from under the pen of the representatives of other professions, like the electronic book of Attila Tatár on algorithmic forex trading[50].

It is encouraging that a growing number of Hungarian language law review articles focuses on various aspects of 'law and tech'. While a decade earlier e-commerce seems to have been in the focus[51], today the attention is increasingly turning towards Blockchain and artificial intelligence[52] (AI) and their nexus to law and the legal profession[53]. The Hungarian Intellectual Property Office even launched a Hungarian language electronic journal – the Industrial Property and Copyright Review [*Iparjogvédelmi és Szerzői Jogi Szemle*][54] – that touches upon also topics that relate law and technology.

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[48] T. Klein – A. Tóth, *Technológia jog – Robotjog – Cyberjog* (Budapest, 2018). Part one, chapter 2, section 1 of the book was written by Győző Endre Szabó.

[49] Zs. Ződi, *Platformok, robotok és a jog* (Budapest 2018).

[50] A Tatár, *A Forex Terminátorai – Robotok* (Bankweb-Budapest 2019).

[51] See, for example, one of the very few English-language publication by A. Szent-Ivanyi, *Hungary: e-commerce – electronic information and commercial services,* in 13(6) ICCLR (2002), 59-62.

[52] See, e.g., A. Tóth, *Algoritmusok és versenyjog* [Algorithms and Competition Law], in *Versenytükör*, No. 2018/2, 40-50. (The author, otherwise professor of law and the President of the Hungarian Competition Authority, analyzed the issue whether there is efficient competition with respect to access to big data necessary for forging an algorithm that could generate individualized offers?).

[53] See also, Z. Ződi, *Jog és jogtudomány a big data korában* [Law and Legal Scholarship in the Era of Big Data], in *Állam és Jogtudomány*, 2017, 1, 95-114; Z. Ződi, *A digitalizáció hatása a jogászi szakmára* [The Impact of Digitalization on the Legal Profession], in *Gazdaság és Jog,* 2018, 2, 3-9; István Harkai, *Az időleges többszörözési kivétel az Európai Unió Bíróságának Joggyakorlatában,* in *Iparjogvédelmi és Szerzői Jogi Szemle*, 2019, No. 5 (Oct. 2019) (The work analyses the approach of the European Court of Justice as far as the multiplication/copying of digital works as opposed to works existing in hard copies).

[54] The website of the journal is at *https://www.sztnh.gov.hu/en/publications/industrial-property-and-copyright-review*

Interesting insights, analyses and thought-provoking papers appear as well on the law-technology nexus. It is a pity that some appear only in Hungary language and thus are not necessarily accessible to those not reading this language. Besides the ones mentioned elsewhere in this paper, the paper of Endre Ferenczy analyzing the impact of new technologies on monographs as the most important products of legal scholars in the 20th century might be mentioned[55]. As he noted, thanks to technology there is a gradual shift from monographs as most valuable types of scholarly publications as far as law is concerned to journals. As journals tend to be fee-based subscriptions, the side-effect of the shift is that scholars from poorer countries gradually get pushed out from the global market as simply they cannot afford financially to be part of such informal global community[56].

4.2. Legislative and Regulatory Developments

4.2.1. Payment Systems and the Payment Services Directive 2 (PSD2)

Although the European Payment Services Directive (EU) 2015/2366)[57] was implemented in Hungary by Law No. 145/2017 (31st of October 2017), which entered into force on 13th of January 2018 as required by the Directive, Hungarian banks are lagging behind irrespective that the transitory period has expired on 14th September 2019. As the directive is a maximum harmonization piece of legislation, the Hungarian law essentially is in line with the laws of other Member States; no major departure can be detected[58].

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[55] E Ferenczy, *Jogtudományi művek a klasszikus és a modern egyetemeken – a monográfia* [Works of Legal Scholars on Classical and Modern Universities – the Monograph], in *Állam és Jogtudomány*, 2011, 2, 263-293.

[56] The author of this paper has raised similar concerns in his article T. Tajti, *The impact of technology on access to law and the concomitant repercussions: past, present, and the future (from the 1980s to present time)*, in *Uniform L. Rev.*, 24 (2019), 396-429 (publication of Unidroit and Oxford University Press).

[57] The basic EU act is Directive (EU) 2015/2366 on payment services in the internal market (15 Nov. 2015). This was amended by Commission Delegated Regulation (EU) 2018/389 (27 Nov. 2017) supplementing Directive (EU) 2015/2366 with regard to regulatory technical standards for strong customer authentication and common and secure open standards of communication.

[58] See E. Papp, *Fintech in Hungary: An Overview*, in *Practical Law Country Q&A*, *https://uk.practicallaw.thomsonreuters.com/w-014-8688?transitionType=Default&contextData=(sc.Default)&firstPage=true&bhcp=1*, last revised: 1-8-2019, 5.

As per Deloitte's survey, Hungarian banks in general are much less innovative and aggressive in granting access to third party fintech companies than their western European kin. In fact, many of the Hungarian banks have taken a defensive stance and limited their activities to the bare minimum yet sufficient to satisfy the legislative expectations[59]. This properly reflects the conservativeness of the Hungarian banking sector that as a rule of thumb sees in the PSD2 an unwanted challenge rather than an opportunity which the banks could also profit from. Indeed, after the 21 June 2019 Opinion of the European Banking Authority (EBA) was aired, the Hungarian National Bank extended the imple-mentation period for another year (until 14 Sept. 2020)[60], in order to give more time to banks and other card issuers. In this period, the application of 'strong customer identification' ("*erős ügyfél hitelesítés*") systems is not mandatory.

As opposed to the banks, Fintech companies, competitors of banks, did not wait to appear on the Hungarian market. Thus, the UK-based REVOLUT system, for example, is in Hungary already, with Hungarian webpages, offering free payment services, a digital debit card and upon request a physical one, and even a cryptocurrency exchange services[61].

4.2.2. Electronic Money in Hungary: the Case of BARION

Hungarians are not lagging behind in creating their own version of electronic money: BARION[62] appeared on the market already in 2013[63] and the issuing firm's – Barion Payment Zrt. – license to continue its related operations was prolonged by the Hungarian National Bank in 2018

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[59] See the related report of Deloitte Hungary of 11 January 2018 at *https://www2.deloitte.com/hu/hu/pages/penzintezetek/articles/psd2-sajtokozlemeny.html#*

[60] See the MNB Decree 35/2017 (14th Dec.). See also the Press Release is available in English language at *https://www.mnb.hu/en/pressroom/press-releases/press-releases-2019/mnb-provides-the-financial-sector-with-additional-time-to-adopt-strong-customer-authentication-procedures*

[61] See *https://www.revolut.com/hu-HU?p=branded_campaign&gclid=EAIaIQobChMIwOKC64-o5QIVw5IYCh0_fgq9EAAYASAAEgJPEfD_BwE*

[62] The website of the firm running the system is at *https://www.barion.com/hu/*

[63] See decision of the Hungarian Financial Supervisory Authority (Pszaf) – the predecessor of the Hungarian National Bank activing as SEC – No. H-EN-I-1064/2013. The license was given based on section 3(1) of Law No. CXII of year 1996 on credit institutions and financial organizations (*Hitelintézetekről és a pénzügyi vállalkozásokról szóló 1996. évi CXII. törvény (Hpt.*))

3. § (1) bekezdés e) pontjában meghatározott elektronikus pénz kibocsátása pénzügyi szolgáltatás végzését.

as well[64]. Barion may be issued on par with Hungarian Forint, the national currency, it has no special exchange rate, or an exchange for its trading. It can be used instead of bank accounts and thus one can receive and transfer money from it; as well as it can be used to pay goods and services with registered sellers and service providers. Although its issuer must exchange it for Forints upon request, if used, it is the e-money that is at the disposal of the user and not the monetary coverage that has to be prepaid (and regularly filled) as a precondition to join and use the system[65]. As per their website BARION is accepted in 20 EU countries, by more than 5,000 merchants (i.e., sellers and service-providers) and more than one-million registered users exist.

4.2.3. Crowdfunding, Platforms in Hungary

No special law exists on crowdfunding ("*közösségi finanszírozás*") in Hungary today either; though the picture is more nuanced given that some of the existent laws may apply to certain crowdfunding forms. The most important related change occurred in 2016 when the Act No. CXX of year 2001 on Capital Markets was amended specifically to make exploitation of crowdfunded platforms exploitable for raising capital by small scale enterprises.

Whether and which of these scattered laws apply depends on what elements dominate a particular platform that can be determined on a case by case basis, as sug-gested by the 2015 MNBs Interpretation[66] – that is in fact the most important guidance (soft law) on this subject matter. As per this, for determining the legal nature of a platform of key importance are the European Union's legal acts, and the opinions of the European Banking Authority (EBA) as well as of the European Securities and Market Authority (ESMA). As sug-gested by ESMA, for example, in Hungary four main types of platforms are spoken of depending on what is that they offer to investors: donation, reward, lending and equity-type platforms[67].

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[64] See decision No. MNB H-EN-I-381/2018.

[65] Z. Szathmáry, *Az eletronikus pénz és a bitcoin biztosítása a büntetőeljárásban*, in *Magyar Jog*, 2015, 11, 639-647; 640.

[66] The text is available in Hungarian at *http://alk.mnb.hu/data/cms2450224/tmp2F0F.tmp(11394111).pdf*.

[67] See, e.g., A. Bethlendi – R. Végh, *Közösségi finanszírozás: valós lehetőség-e a hazai kisvállalatok számára?*, in *Hitelintézeti Szemle*, 13 (2014), 102-126, where the authors refer to the ESMA classification on page 103. While the difference between donative and rewarding platforms is that in case of the former the investor gets no consideration in return for his investments, in case of the latter there is a symbolic return. The

(segue)

Consequently, if securities are issued by a platform, or more precisely instruments that satisfy the definition of 'security' in the laws in force, the platform could be subject to the mentioned Capital Markets and the Ac on Investment Services[68]. In case of lending-type platforms, on the other hand, the regulations on banking and other lending institutions could apply *mutatis mutandis*[69]. Under some circumstances, however, the platform may be caught by the laws on consumer groups ("*fogyasztói csoportok*"), banking deposits or be treated as intermediation ("*közvetítői tevékenység*")[70].

Notwithstanding such indeterminacy, the first Hungarian platforms began their operations in the country[71]. Two are normally mentioned (both charitable): the AdjunkÖssze.hu[72] and the GiveMyChance[73] platforms. The TŐKEPORTAL[74] is only about to launch its first campaigns in 2019.

4.2.4. Blockchain Law: the Opinion of the Data Protection Authority

At the moment there is no specific regulation on Blockchain[75]. Thus, what is available is the Hungarian Data Protection Authority's opinion on the data protection aspects of Blockchain technology and cryptocurrencies in July 2017[76]. The five and a half page-long opinion, besides explaining the mechanisms of Blockchain technology, attempted also

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lending-type platforms foresee that the money given by investors must be repaid with interest. As opposed to that in case of equity-type platforms equity or fixed-income-like securities investments are at stake.

[68] The full title of the act is *A befektetési vállalkozásokról és az árutőzsdei szolgáltatásokról, valamint az általuk végezhető tevékenységek szabályairól szóló 2007. évi CXXXVIII törvény.*

[69] The full title of the act is *2013. évi CCXXXVII törvény a hitelintézetekről és a pénzügyi vállalkozásokról.*

[70] See the 2015 MNB Interpretation.

[71] For a short rundown see Sz. Simon, *Crowdfunding – A gyorsan fejlődő közösségi finanszírozás*, in *Fintechzone* (24 May 2019), *https://fintechzone.hu/crowdfunding-a-gyorsan-fejlodo-kozossegi-finanszirozas/*

[72] See the website of the platform at *https://adjukossze.hu/*. The platform is dominated by charitable projects and its slogan is 'the platform, where the civil society and its supporters meet.' Besides helping various animal shelters, they finance the Mérce Magyarország news portal (*https://adjukossze.hu/kampany/tetszik-a-merce-olvasd-tamogasd-1101*); Hungary's first Independent news portal entirely financed by donations.

[73] See the website of the platform at *https://givemychance.com/kampanyok*. The platform supports hospitals, schools, individuals in need of particular medicaments.

[74] The website of the platform is at *https://tokeportal.hu/rolunk/*.

[75] See E. Papp, *Fintech in Hungary: An Overview*, in *Practical Law Country Q&A*, cit.

[76] The Hungarian language opinion could be found at *https://www.naih.hu/files/Adatved_allasfoglalas_naih-2017-3495-2-V.pdf*

to apply EU data protection to this specific context. It dealt also with the problems concerning jurisdiction and specifically with the problem of user profiling (i.e., possibility to monitor the user being part of a Blockchain system).

Is it because of the extreme hype surrounding cryptocurrencies and Blockchain, or because of genuinely understanding of the potential hidden in Blockchain technology, it is not known, yet it is a fact that Hungary was the 29th country to sing the Declaration creating a European Blockchain Partnership on 18 February 2019[77]. It seems a valid statement that the initial focus on cryptocurrencies has by now shifted to interest in other potential uses of the technology in Hungary, too[78].

4.2.5. Initial Coin and Initial Token Offerings (ICOs and ITOs)

ICOs and ITOs are not subject to particular direct regulation in Hungary for the time being, expressing that perception of these creature of technology is not yet fully clear and whoever is engaged in issuance of coins or tokens obviously operates in a grey area plagued by risks and open questions. The topic is otherwise quite well-known among tech-oriented people, including the legal profession. Moreover, some Hungarian crypto-currencies have also been created, though none seem to have become a major success story so far. Mention could be made of the KoronaCoin[79] and the one launched by the stock-exchange-listed company FUTURAQUA trading in water under the name of WATEREUM[80].

From the related press releases and various publications of the Hungarian National Bank, as the top body overseeing and regulating the world of finances, however, gradually some more concrete conclusions are becoming crystallized. Needless to say, the HNB regularly communicates to the public through its website all the caveats and warnings stemming from the European Securities and Markets Authority (ESMA)[81]. These include, in particular, *first*, that ICOs issued abroad under a license obtained in another EU member state and sold in Hungary are

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[77] See E. Papp, *Fintech in Hungary: An Overview*, in *Practical Law Country Q&A*, cit., 7.

[78] Id.

[79] The website of the initiative is at *https://www.trackico.io/ico/korona-coin/*

[80] See Budapest Business Journal, FuturAqua creates blockchain-based cryptocurrency (5 July 2018), at <*https://bbj.hu/finance/futuraqua-creates-blockchain-based-cryptocurrency_151773*>.

[81] See, e.g., the English-language Press Release, *ESMA highlights ICO risks for investors and firms*, as of 13 November 2017, *https://www.mnb.hu/en/pressroom/press-releases/press-releases-2017/esma-highlights-ico-risks-for-investors-and-firms*

not within the purview of the NB[82]. *Secondly,* and this is most telling about the uncertain qualification of ICOs and ITOs, is that the determination of whether the NB is entitled to monitor ICOs and/or ITOs issued by Hungarian individuals or firms depends on the facts and circumstances of each and every case. In other words, it could be that certain ICOs and ITOs would be treated similarly to crowdfunding, meaning that the investors would be looked upon as lenders subject to licensing. As opposed to that, some ICOs and ITOs may qualify as transferable securities and startups raising money on the market through ICOs or ITOs may be likened to issuers of securities who are also subject to strict regulatory requirements[83].

4.2.6. Algorithmic Trading

Initially the picture on algorithmic trading was obscure, thanks to a great extent to a host a expressions used interchangeably – from 'systematic-,' 'quantitative-', high-frequency-', 'model-', and 'program-trading'[84]. Today, both the terminology and the phenomenon as such are clearer thanks to a great extent to the guidance coming from Brussels, concretely the MiFID II Directive that defines and regulates algorithmic trading. Con-sequently, the Hungarian National Bank did already issue related interpretations[85] and the Budapest Stock Exchange does have rules specifically

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[82] Hungarian National Bank Press Release, *Rendkívüli kockázatot hordoznak az ICO-befektetések* as of 28 Dec. 2017, available in Hungarian at *https://www.mnb.hu/sajtoszoba/sajtokozlemenyek/2017-evi-sajtokozlemenyek/rendkivuli-kockazatot-hordoznak-az-ico-befektetesek*

[83] Such qualification would be in line with the ESMA Advise on Initial Coin Offerings and Crypto-Assets (9 January 2019 | ESMA50-157-1391). See on this also the related newsletter of the Budapest Office of the Austrian law firm Schönherr, Hungary: Uncertainties related to ICOs and ITOs (18 April 2018) at *https://www.schoenherr.eu/publications/publication-detail/hungary-uncertainties-related-to-icos-and-itos*

[84] See E. M. Tatár, *Algoritmikus kereskedés: iparági trend vagy a piac buborékká válása?,* in 10 *Hitelintézeti Szemle* (2011), 186-200. (The article focuses on algorithmic trading in the post 6hth of May 2010 flash-crash years, primarily reviewing the pertaining western literature and developments.)

[85] As per interpretation No. 1/2017 of the definition of algorithmic trading in section 4(1), point 39 of MiFID II (Directive 2014/65/EU), even simple algorithms are caught by the system and algorithmic trading is when "the individual parameters of an order [timing, price, quantity], as well as the handling of the order itself, are done by a computer algorithm without human interference, or with minimal human intervention, after the placing of the order in the trading system".

on algorithmic trading[86]. The latter, among others, require those providing investment services to test the algorithm used by them and the rules specifically state that the exchange does not issue any certificate on the appropriateness of the algorithm and the liability for any malfunctioning rests entirely with the service providers.

4.2.7. Other Laws and Regulations of Relevance to Fintech and Legal Tech

Besides the above there a few laws that specifically target certain aspects of the broader field of 'law and technology'. In particular, two laws related to Cybersecurity. These are Act No. L of 2013 on Electronic Information Security of Central and Local Government Agencies and Decree No. 41/2015. (VII. 15.) of the Ministry of Interior[87].

5. Technology in Courts: Swindling of Cryptocurrencies

It should not come as a surprise that cryptocurrencies have reached the desks of Hungarian judges the first. The available databases confirm this finding as well given that the other search-terms do not yield too many results.

From among the many, a criminal case stands out as it involved a crime committed in Hungary: a fraud case in which the culprits swindled out of the victims cryptocurrencies (Bitcoins) worth a larger sum of money. As one could expect, the court adjudicating the case asked for expert opinion (following the suggestion of the public prosecutor) essentially concerning the traceability of cryptocurrency transactions and the value of 15 units of Bitcoin.

The expert, Dániel Eszteri, published a related article (in Hungarian language)[88] though without publicizing any data that might have

[86] See the BET rules on algorithmic trading (in English language) – issued with reference to MiFID s. 48(6) – at <*file:///C:/Users/Administrator/Downloads/BSE%20algo%20requirements%20and%20registration%2020171026.pdf*>.

[87] See E. Papp, *Fintech in Hungary: An Overview*, in *Practical Law Country Q&A*, cit., 10. The full titles are *2013. évi L. törvény az állami és önkormányzati szervek elektronikus információbiztonságáról* and *41/2015 (VII. 15.) BM rendelet az állami és önkormányzati szervek elektronikus információbiztonságáról szóló 2013. évi L. törvényben meghatározott technológiai biztonsági, valamint a biztonságos információs eszközökre, termékekre, továbbá a biztonsági osztályba és biztonsági szintbe sorolásra vonatkozó követelményekről.*

[88] D. Eszteri, *Egy Bitcoinnal elkövetett vagyon elleni bűncselekmény és az ahhoz kapcsolódó egyes jogi kérdések*, in *Infokommunikáció és Jog*, 2017, 1, 25-31, *https://infojog.hu/eszteri-daniel-egy-bitcoinnal-elkovetett-vagyon-elleni-buncselekmeny-es-az-ahhoz-kapcsolodo-egyes-jogi-kerdesek-20171-68-25-31-o/*

revealed the identity of the parties and the case. Consequently, some of the interesting details potentially revealing how the judge(s) adjudicating the case comprehended and perceived cryptocurrencies and Blockchain technology unfortunately could not be shed light on. Here, we will limit ourselves to some of the most interesting points as there is no need to retell the details on Blockchain technology what was otherwise a must in the court case given that the county court ("*járásbíróság*") initially rejected the request for determining the value of the virtual currency[89].

5.1. The Facts of the Case

The case concerned a bitcoin sale and transfer transaction that was to occur in one of the bars of a hypermarket in the town where the victim – the seller of 15 units of Bitcoin – resided. This ensued after a few email exchanges, which fixed also that the 2.5 million Hungarian Forints (HUF)[90] purchase price was to be handed over in cash by the buyer (the principal in the first degree) right after the transfer. Indeed, the victim came to the meeting with his/her laptop and as agreed upon, he/she transferred the 15 units of bitcoin in front of the swindlers to the address given by the principal in the first degree. Thereafter, the culprits said that the cash is in the back of their car in the parking, so they jointly set out towards the parking lot, with the culprits leading the way. However, in the moment they left the warehouse building, the swindlers looked at each other and unexpectedly ran away, jumped into their car and closed the car's doors from inside. The seller attempted to block them driving away by jumping in front of the car, but he/she was hit, fell on the engine hood but was in the position not to fall by clinging to the windshield wiper; continuously shouting for help. Eventually, the swindlers could not escape as an uni-dentified third person blocked their escape route with his car.

Soon the police arrived and apprehended the swindlers. What is indicative is that the police officers took the required identification steps, made records, yet have initiated criminal proceedings only for traffic offence and attempting of an assault. In other words, the officers were not capable of understanding the nature and gravity of the crime. As a result, none of the IT devices of the swindlers were seized. Only after the subsequent testimony of the victim were charges for committing fraud been filed.

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[89] D. Eszteri, *Egy Bitcoinnal elkövetett vagyon elleni bűncselekmény és az ahhoz kapcsolódó egyes jogi kérdések,* cit., 25.

[90] The exchange rate of the Hungarian National Banks for 1 Euro was 332.72. HUF on 17 of October. This means that about 7.530 Euros were at take in the case.

The final charge for fraud claimed, first, that the culprits defrauded the victim acting in collusion, second, the purchase price was not available to them, and third, it was not in their intention to transfer it. The victim filed also a claim for damages.

5.2. Traceability of Cryptocurrencies

One of the issues that arose in the case that deserves commenting relates to the traceability of cryptocurrencies. Namely, as the investigations of the expert showed, the swindlers obviously were knowledgeable in how blockchain-based cryptocurrencies work given that they have made the bitcoins disappear – or rather become untraceable – on the very day on which they committed their crimes. This they achieved by quickly transferring the bitcoins eventually to 327 different Blockchain addresses.

The dates and the number of addresses, more precisely, were as follows:

– First, the principal swindler established his/her Blockchain address (address 'A') on 28th of December 2013 at 20:23:54 hours;

– Second, exactly 15,27591199 bitcoins landed on address 'A' of the swindler from 25 other addresses exactly on 8th of February 2015 at 12:13:03 hours;

– Third, *on the same day, exactly at 15:19:51 hours*, the principal swindler transferred 15 bitcoins to another address (address 'B') (a bit later the remaining o.276 bitcoins were also transferred);

– Fourth, *on the very same day, at 17:00:22 hours*, the Bitcoins were transferred to 17 new addresses from address 'B';

– Finally, from these 17 addresses the bitcoins were soon thereafter but the same day transferred to 327 new addresses. According to the opinion of the expert, the bitcoins were not traceable from this point on[91].

What these data suggest is that the seizure of the IT devices of the swindlers would have most presumably prevented the transactions of the culprits resulting in the lost track of bitcoins[92]. It would have been interesting to see whether the case has had any impact on the police forces yet there is no such information yet.

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[91] D. Eszteri, *Egy Bitcoinnal elkövetett vagyon elleni bűncselekmény és az ahhoz kapcsolódó egyes jogi kérdések*, cit., 26-27.

[92] D. Eszteri, *Egy Bitcoinnal elkövetett vagyon elleni bűncselekmény és az ahhoz kapcsolódó egyes jogi kérdések*, cit., 27.

5.3. The Value of bitcoin

The expert in the case departed from the presupposition that the value of bitcoin entirely depends on the supply and demand on the market as well as that the value of Bitcoin is extremely volatile. Consequently, he checked the daily exchange rates on the three largest bitcoin-exchanges through <bitcoincharts.com> for 8th of February 2014 (the day or transfers). While the daily average sales rate was 714,06 USD for 1 BTC, the average purchase price was 694.09 USD for 1 BTC[93]. In brief, he found the 2.5 million HUF damages claim justified.

5.4. The Attachment of Bitcoin

Whether and how could bitcoins be attached (seized) was another interesting question raised in the case. In the opinion of the expert, the seizure of the device used for the receipt of bitcoin-transfers and through that the attachment of the ledger saved on the hard drive of the device could prevent unauthorized transfers[94]. Another author, in an article from 2015, comparing he solutions of Hungarian and German criminal procedure laws raised some doubts and vouched for a more flexible solution that would "not be specifically a Bitcoin-targeted solution yet which would be sufficiently flexible to deal with the problem"[95].

6. Conclusions

As this short rundown showed, Hungary is normally neither at the forefront, nor the very last of the Member States implementing the fintech-related EU laws. As per the IMD World Digital Competitiveness Report 2019, Hungary is on the 47th position (losing one position compared to 2017) among the 63 countries ranked[96]. The number of interesting projects,

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[93] D. Eszteri, *Egy Bitcoinnal elkövetett vagyon elleni bűncselekmény és az ahhoz kapcsolódó egyes jogi kérdések*, cit., 28.

[94] D. Eszteri, *Egy Bitcoinnal elkövetett vagyon elleni bűncselekmény és az ahhoz kapcsolódó egyes jogi kérdések*, cit., 28-29.

[95] Z. Szathmáry, *Az elektronikus pénz és a bitcoin biztosítása a büntetőeljárásban*, in *Magyar Jog* 2015, 11, 639-647, 645.

[96] The report is available at *https://www.imd.org/contentassets/6b85960f0d1b42a0a07ba59c49e828fb/one-year-change-vertical.pdf*. On the 'digital competitiveness' of Hungary see also the study of M. Csath, Competitiveness Based on Knowledge and Innovation, in Public Finance Quarterly, 2018, 1, 64-79. The Quarterly is published by the State Audit Office of Hungary.

developments and start-ups that try to exploit new technologies, however, is worth mention especially relative to the size of the country and its economic strength. Commercial banks seem to be less innovative and aggressive in introducing new technologies, what does not seem to be an exception in the region. Hence, Robin Marshall seems to be right in claiming that "Hungary performs on par with its regional neighbors when it comes to innovation, but lags behind more established states further west"[97].

As far as the available literature is concerned, industrial publications and writings coming out from under the pen of various project-participants clearly dominate the market. As opposed to that, while the Hungarian language 'law and technology' and fintech-related literature is promising and in fact slowly expanding, this is hardly paralleled by English (or other foreign) language publications. Hence, learning on what is really happening in Hungary is at the moment far from being easy if adjudged based on publications of lawyers abroad. Yet the appearance of the mentioned Hungarian language textbooks on the market is a clear sign of the increasing interest in legal and fintech in the country. This can be validly claimed even though no comparative data on such publications in other European countries is available. At the moment, the surfacing of the first court case involving Bitcoin fraud, together with the first expert opinion discussed (at least) via the pages of a law review seems to be most instructive for all those interested in these emerging fields of law. And this is the main reason why this short account on Hungarian developments is worthwhile to be read.

[97] See R. Marshall, *AI, Digitalization Could Offer Hungary a Place at the Top Table*, in B*udapest Business Journal*, May 10 – May 23, 2019, 2.