

Digital contracts: Thinking in trends

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Rezumat: În contextul globalizării și integrării practicilor de drept privat, problema executării corecte și a certificării valabilității contractelor digitale devine din ce în ce mai importantă. În acest articol, încercăm să facem o analiză aprofundată a principalelor factori determinanți ai tendințelor care determină dezvoltarea contractelor digitale, atât în viața de zi cu zi, cât și în situații de urgență cauzate de răspândirea bolilor respiratorii acute cauzate de virusul COVID-19. Articolul include concluziile la care am ajuns în urma studiului și ne permite să formulăm vectorii generali pentru ulterioara digitalizare a relațiilor juridice.

Cuvinte-cheie: contract; contracte digitale; digitalizare; acorduri digitale; contracte electronice.

Abstract. In the context of globalization and integration of private law practices, the issue of proper execution and valid certification of digital contracts is becoming increasingly important. In this article, we try to make a thorough analysis of the main trend determinants that determine the development of digital contracts, both in everyday life and in emergencies caused by the spread of acute respiratory disease caused by the virus COVID-19. This article demonstrates the conclusions we reached as a result of the study and allows us to formulate general vectors for the subsequent digitalization of legal relations.

Keywords: contract; digital contracts; digitalization; digital agreements; e-contracts.

The transformational changes that have occurred in the Ukrainian legal space after the transition to market mechanisms of economic activity have significantly transformed and continue to optimize the process of digitalization of relations between its subjects. The secondary role of the state in the normative regulation of the market, the development of contractual relations between territorially distant counterparties and the strengthening of legal responsibility for violations in the field of electronic contracts determined the priority of their status in the formation of a system of interactions in the field of transactions in a remote format. In this regard, the increase in the number of digital contracts between various subjects of civil relations is crucial for the

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optimal and effective functioning of participants in civil turnover and at the same time progressively increased the relevance of our research.

In order to bridge the gap between the old non-digital practice and current digital ecosystem Das et al. (2019) highlighted, programming digital contracts comes with unique challenges, which include expressing and enforcing protocols of interaction, controlling resource usage, and preventing the duplication or deletion of a contract's assets.² Their opinion had resulted the appearance of many followers (Mira Burri, Rodrigo Polanco and many other). Their findings (2020³) indicated that: the evolution of digital trade provisions in preferential trade agreements, highlighting also some emerging trends.

It would be reasonable to assume that the grave global crisis makes it vital to rethink the process of introducing digital contracts to build a more perfect model of legal transformation that meets the national interests of each state. This determines the important scientific and practical importance of a detailed study of the reform experience of other countries, where the use of electronic agreements is ubiquitous at different levels. Depending on the level of technical development Reshetnyak (2018), identifies three groups of countries: (1) countries in which the submission of documents to the court is mandatory in electronic form and is used in all civil cases (eg, Singapore), (2) countries where the electronic form of filing documents is used at all times, but on a voluntary basis (Israel, US federal courts, Australia), (3) countries where electronic filing is possible in some courts (England, Canada, Germany).⁴

At first glance we have to agree with Burri's statements (2016) that "cross-border data flows are essential to the contemporary digital economy, and while states are eager to seize the opportunity of digitization as the fourth industrial revolution, they also often impose borders in the digital space, so as to protect vital interests, such as national security or privacy".⁵ In this respect, the experience of Germany is very interesting here. According to Kalamayko (2013), one of the most important directions of reforms in the introduction of electronic technologies in civil law and proceedings is the interaction of all

² A. Das, S. Balzer, J. Hoffmann, F. Pfenning, *Resource-aware session types for digital contracts*, Cornell University, November 2019.

³ M. Burri, R. Polanco, *Digital Trade Provisions in Preferential Trade Agreements: Introducing a New Dataset*, *Journal of International Economic Law*, Volume 23, Issue 1, March 2020, p. 187.

⁴ V.I. Reshetnyak, Electronic form of submission of documents to court (experience of foreign civil proceedings) [Решетняк В. И. Электронная форма подачи документов в суд (опыт зарубежного гражданского судопроизводства)]. 2018 <http://w.pc-forums.ru/h207.html> [Online] accessed on 13/11/2020

⁵ M. Burri, *The regulation of data flows through trade agreements*, *Geo. J. Int'l L.*, 2016. p. 407.

stakeholders. The Law “On Legal Services”, contains a direct indication of the obligation of lawyers to use the information system of digital proceedings ProfiMahn, which allows the user to establish a two-way system of information exchange with the court and receive all necessary information, the process of its consideration, as well as access to judicial acts.⁶

But still, the global economy, according to Shamel (2016), is undergoing a digital shift that is changing key production and trade models. He presumed that this process is likely to expand in the coming decades with rapid growth in digital trade and also with growing digital-based restructuring of “traditional” manufacturing, agriculture, and services sectors. While trade in “traditional” goods and services is subject to clear and strongly enforceable rules through multilateral, regional, and bilateral agreements, some of the key areas relevant to the digital economy are still weakly regulated. This, over the last few years, has provided more “policy space” to late-coming economies to implement what this paper called digital industrial policy to achieve technological catching-up with the advanced economies. A large number of policy tools including data localization requirements, internet filtering, and technology transfer conditions have been used to promote national digital firms and to allow them to catch-up with the leading firms in the field. As Shamel (2016) continued, China, in particular, has provided a case of digital catching-up through the extensive use of digital industrial policy which enabled Chinese giant internet firms to dominate the domestic market and to use this market as a platform for global expansion and to challenges the position of leading American firms in the field. With the growing importance of digital catching-up economically, more countries, including many advanced economies, might follow suit by implementing digital industrial policy.⁷

More explicitly this aspect was investigated by Dekker et al. (2020) who came to result of conclusion that the broad scope of EU regulatory activism in the digital arena makes US engagement imperative, if for no other reason than to ensure that the interests of US companies are respected, especially regarding any requirements that may affect how they operate in the United States. Some may ask whether engaging with the EU on its active regulatory agenda is appropriate or useful for those seeking a more open, deregulated environment. The reality, however, is that regulation at the EU level often simplifies the hodgepodge of diverting regulations adopted by the twenty-eight member states, creating a relatively more open European market. Moreover, EU efforts to regulate the digital economy, as was described by the authors, are not going

⁶ A.Y. Kalamayko, *Electronic technologies in civil process: questioning* [Каламайко А. Ю. Електронні технології в цивільному процесі: постановка питання] Університетські наукові записки. № 1 (45). 2013. pp. 159-165.

⁷ S. Azmeah, C. Foster, *The TPP and the digital trade agenda: Digital industrial policy and Silicon Valley's influence on new trade agreements*, Working Paper Series, 2016. p. 30.

to disappear, no matter what the United States' reaction. Thus, it is important for the United States to engage early with the EU on these issues.⁸

One of the key factors of innovative development is the presence of a favorable environment and an innovative climate that stimulate the creation of innovations, ensuring the transformation of ideas and developments into market products, the introduction of these products into the most important sectors of the economy and the social sphere. The World Economic Forum estimates that digitalization holds enormous potential for business and society over the next decade and could generate more than \$ 30 trillion in additional. US dollars of income for the global economy until 2025. Currently, the digital economy is one of the most widely discussed aspects of the global socio-economic process, which has numerous, multifaceted and diverse manifestations. From the Burwell's (2018) point of view, three prominent elements need to be researched here: (1) e-commerce; (2) the platform economy; and (3) digital payments at the global perspective.⁹ We truly believe that digital economy is based on the deep penetration of digital technologies, that is, the use of hardware and software for collecting, processing and transmitting digital information, in all spheres of economic activity of social relations.

Assessments of the phenomenon of the digital economy are ambiguous, but researchers agree that its study is absolutely necessary, and only scientific understanding can make it possible to achieve a harmonious combination of technical and technological progress and socio-economic life. As it was proved in Vanden's research (2005), digital contracts (the basic building blocks for asset pricing) are extremely useful financial instruments.¹⁰ It is obvious, that the times when digital contracts will be widely used as "new normal" are rapidly approaching, and all processes of our life without exception are undergoing total automation. As Cardenas et al (2018) have noted, they expect to validate the idea of near-future scenarios where autonomous or semi-autonomous agents are endowed with, a type of, social autonomy and the ability to engage in financial transactions.¹¹ Kononets et al. (2020) shared the assumption that a lot of financial transactions as well as legal obligations are being already transferred in blockchain environment all over the world daily.

⁸ B. Dekker, M. Okano-Heijmans, *Europe's Digital Decade? Navigating the global battle for digital supremacy*, Clingendael Institute, October 1st, 2020, p. 13.

⁹ F.G. Burwell, *The next steps for US-EU digital cooperation. Making America First in the Digital Economy: The Case for Engaging Europe*, Atlantic Council, 1st of May., 2018, p. 15.

¹⁰ J.M. Vanden, *Digital Contracts and Price Manipulation*, The Journal of Business, Vol. 78, No. 5, September 2005, pp. 1910.

¹¹ I.S. Cardenas, J.K. Hoon, *Robot-Human Agreements and Financial Transactions Enabled by a Blockchain and Smart Contracts*, Companion of the 2018 ACM/IEEE International Conference on Human-Robot Interaction, March 2018 p. 337.

However, there are still indefinite perspectives such technology on commodity market applications what confirms a rare practical implementation of smart-contracts in real working projects on the market (for example, there is both lack of literature on using smart-contracts in the food supply chains and only a few even blockchain based projects working on agricultural market all over the world).¹²

The exacerbation of modern problems caused by the simultaneous impact of global crisis processes, imbalances between the sectors of the domestic economy and the upcoming digital transformation of most areas of activity, actualizes the search for effective solutions to modernize such a strategically important industry as the legal processing of transactions. The large-scale use of digital technologies has become a stable trend in the development of contract law around the world in recent years. At the same time, the elements of the modernization mechanism in the digital economy remain uncertain, its content is unidentified and contradictory, only a set of factors that determine the objective need for modernization remains constant – ensuring the country's legal security. Note, this means equipping stakeholders to reap the opportunities that digitalization offers for any economy, and to guide them through the emerging stand-off that arises because of countries' varying normative interpretations and practical applications of digital data.¹³

The wide distribution and variety of manifestations of electronic economic activity have led to the fact that the concept of “electronic commerce” receives a variety of explanations. The consequence of this was the lack of a clear and comprehensive legal regulation of this phenomenon. Serious efforts are being made both by individual states and at the international level to establish uniform regulation. However, the absence of coordination in the regulation of e-commerce leads to the fact that, despite the wide involvement of international intergovernmental and non-governmental organizations, states and individual specialists in this activity, significant results have not yet been achieved. Unfortunately, the Ukrainian legislator does not demonstrate consistency in the normative consolidation of the possibility and procedure for notarization of transactions made in electronic form. Evidence of this can be found at the Legislative Act of Ukraine «On Electronic Documents and Electronic Documents Circulation» (dated 22.05.2003) № 851-IV established that the notarization of the civil law agreement concluded by creation of the electronic document (electronic documents), is carried out in the order

¹² Y. Kononets, M. Rajčániová, *The algorithm of digital contract with features of a smart-contract on a commodity market*, Global and regional problems of informatization in society and nature using, 2020. Volume: 211. pp. 30-33.

¹³ M. Okano-Heijmans, *How to strengthen Europe's agenda on digital connectivity*, Clingendael Institute, 1st of July, 2019, p. 2.

established by the law (art. 8).¹⁴ Instead, the Legislative Act of Ukraine “On Electronic Commerce” № 675-VIII (dated 03.09.2015), adopted 12 years later, on the contrary, states that this normative legal act does not apply to transactions subject to notarization or state registration (p. 2 art. 1).¹⁵ Once again, there is also evidence of alternative source – the Legislative Act of Ukraine “On electronic trust services” (dated 05.10.2017) № 2155-VIII stated that the use of electronic trust services does not change the procedure for transactions established by law. In other words, transactions subject to notarization and / or state registration in cases established by law, are made in electronic form exclusively with the use of qualified electronic trust services and in the prescribed manner (p. 6 art. 17).¹⁶ At the same time, as noted in the Basic Principles of Information Society Development in Ukraine for 2007-2015, Ukraine has its own history of development of the basic principles of the information society: the activities of the world-famous school of cybernetics; formation in the early 90s of the last century of the concept and program of informatization; creation of various information and communication technologies and national information and analytical systems of different levels and purposes (paragraph 2, section 1).¹⁷ Although there have always been certain unclear areas, but recognizing the evolutionary nature of economic development and the inevitability of digitalization, it should be noted that currently, the legislator in my country, as it was shown above, unfortunately, lacks a comprehensive, holistic approach, the use of which would ensure the electronic transformation of the entire contractual ecosystem, as well as the regulatory regulation of this environment.

The next question that calls for the answer, is connected with the possibility of usage digital contracts in e-trials as a new sort of evidences. In modern conditions, the information resource has become one of the main factors influencing the functioning of most state, municipal, public structures and entities. It is assumed that informatization of all spheres of society's life will create an intellectual foundation for solving a wide range of global

¹⁴ On Electronic Documents and Electronic Documents Circulation: Legislative Act of Ukraine № 851-IV (dated 22.05.2003) <https://zakon.rada.gov.ua/laws/show/851-15#Text> [Online] accessed on 13.11.2020.

¹⁵ On Electronic Commerce: Legislative Act of Ukraine № 675-VIII (dated 03.09.2015) <https://zakon.rada.gov.ua/laws/show/675-19#Text> [Online] accessed on 13.11.2020.

¹⁶ On Electronic Documents and Electronic Documents Circulation: Legislative Act of Ukraine № 851-IV (dated 22.05.2003) <https://zakon.rada.gov.ua/laws/show/851-15#Text> [Online] accessed on 13.11.2020.

¹⁷ On the Basic Principles of Information Society Development in Ukraine for 2007-2015: Legislative Act of Ukraine № № 537-V (dated 09.01.2007) <https://zakon.rada.gov.ua/laws/show/537-16#Text> [Online] accessed on 13.11.2020.

problems. At the same time, the transition of information to the category of strategic resources of the state and society poses an acute problem of managing this resource. There is a steady trend towards an increase in the share of automated generation, processing, collection, storage, transmission, search, presentation and reproduction of information in the management processes of all levels of life both in the activities of an individual and society as a whole. Information systems and processes, communication technologies penetrate deeper and deeper into various spheres of state administration. The system of judicial proceedings did not stand aside either.

Initially, in such a system, in accordance with paragraph 1 of the Concept of the electronic court of Ukraine, any information can be entered and used at any workplace where the appropriate level of access is authorized.¹⁸ Moreover, Petrenko (2019) has expressed concern for the fact that electronic forms of legal relations have reached such a level in the flood of life, but the stench has become an important part of information, and that will require a specific regulatory regulation when victorious in the process of verifying civilly.¹⁹

Specifically, this change may begin in the form of the Khanyk-Pospolitak`s suggestions (2017) of highlighting the main trends of digital tools implementation in courts, such as: (1) saving money and time; (2) speeding up the terms of dispute resolution; (3) simplification of access of process participants to case materials; (4) simplification of the work of all subjects of civil proceedings.²⁰ The point is, however, that while the idea of extended use of digital contracts by courts (as the evidences) is at an early stage of its application, further implementation of tasks on the development and modernization of information technology is still needed, which will allow to reach a qualitatively higher level in the field of court informatization and the use of electronic systems. In addition, Pekarchuk and Pushenko (2017) emphasized that the use of modern technologies (including the digital contracts) dramatically simplifies the proceedings, saves time and money of citizens, provides transparency and accessibility; and for the judiciary it is the

¹⁸ Information Judicial Systems: the concept of the electronic court of Ukraine. 2012 http://www.kbs.org.ua/files/koncept_d.pdf [Online] accessed on 13.11.2020.

¹⁹ V.S. Petrenko, *Problems of legal regulation and use of electronic court* [Петренко В. С. Проблеми правового регулювання та використання електронного суду] <http://dspace.onua.edu.ua/bitstream/handle/11300/9503/Petrenko%2041-49.pdf?sequence=1&isAllowed=y> [Online] accessed on 13.11.2020.

²⁰ R. Khanyk-Pospolitak, *Introduction of electronic justice in civil proceedings of Ukraine* [Ханик-Посполітак Р. Запровадження електронного правосуддя у цивільному судочинстві України] *Право України*. 2017. № 8. pp. 122-129.

optimization and automation of the judiciary, the development of technology and budget savings.²¹

Note that in the context of digitalization of the legal sphere, one of the limiting factors for increasing the efficiency of electronic contracts related to the transfer of funds, the applied regulatory methods are aimed at solving individual local problems and do not help to eliminate the remaining problems: low quality of digital legislation, mistrust of state authorities on the part of subjects of civil legal relations, especially the national legal mentality, etc. In this regard, the process of improving the legal framework and accumulating resources for general digitalization should be complex, including the optimization of office procedures and the harmonization of civil relations. Thus, in 2000, Jonathan and colleagues applied the concept of number and variety of derivatives contracts available over the counter, on exchanges, and through private placements has grown substantially in the past decades. In fact, there is a small cottage industry devoted simply to the classification of contracts into hierarchies. Meanwhile, different academicians and practitioners are busily employed deriving formulas to value these increasingly complex contracts.²² In addition, Vaden (2005) have expressed the concern, the while digital contracts continue to proliferate across many financial markets, there are some markets in which digitals are traded, it is not immediately clear that corporate insiders are involved in these transactions.²³ Evidence of this can be found in the results of Fortenberry`s research (2019), where he claimed that the conclusion calls for a critical discussion of the principles of digital documentation in legal preservation. This discussion begins a dialogue about dynamic and flexible best practices in digital documentation deployment in research and legal practice, as these technologies become more accessible to academic programs and preservation practitioners in the years ahead.²⁴ Recently, the so-called smart contracts are becoming more widespread in applied sciences, which, in contrast to the software agreements, have much in common with the digital contracts we studied in this article.²⁵

²¹ V.M. Pekarchuk, N.V. Pushenko, *Introduction of electronic court - a significant step towards improving the efficiency of justice in Ukraine* [Пекарчук В. М., Пушенко Н. В. Запровадження електронного суду – помітний крок до підвищення ефективності судочинства в Україні] Вісник ЛДУВС ім. Е. О. Дідоренка. 2017. № 1 (77). pp. 81-88.

²² J.E. Ingersoll, *Digital Contracts: Simple Tools for Pricing Complex Derivatives*, The Journal of Business, Vol. 73, No. 1, January 2000, p. 67.

²³ J.M. Vaden, *Digital Contracts and Price Manipulation*, The Journal of Business. Vol. 78, No. 5, September 2005, pp. 1907.

²⁴ B. Fortenberry, *Digital Documentation in Historic Preservation Education and Research: Prospects and Perils*, Preservation Education & Research. Vol. 11/2019, pp. 81-116.

²⁵ M. Bartoletti, *Smart Contracts*, Frontier in Blockchain, Vol. 3. Art. 27. June, 2020. pp. 1-5.

The process of integration of communication and information technologies in society proceeds against the background of inequality in the level of knowledge, experience and tools of individuals, depending not only on the amount of income, but also on geographic factors, local living conditions, and, last but not least, on professional affiliation. In this regard, the regulation of public relations on the use of modern technologies, among which the most common are elements of electronic document management (in particular, electronic contracts) and analogs of a handwritten signature are becoming relevant in the formation of legal reality. Furthermore, in 2006 Kukharev commented that notarial dedication to the righteousness can be given to all demands, which should be put before the written right holders, with one exception – dedicated to a specially appointed person (notary, appointed persons, consuls), according to the law of Ukraine before the notary.²⁶ As Laborde continued in 2010, contracts relates to real estate (except lease contract), family and succession law, or requiring the involvement of courts or public authorities as well as suretyship or collateral contracts may still require a handwritten signature.²⁷ In case an EU member state decides to exclude the applicability of the Electronic Commerce Directive to other contracts. It has to submit a report to the European Commission every five years explaining the reasons for maintaining the exclusion (Art. 9.3). Williams A. et al. (2011) also paid attention to the fact that despite the existence of extensive legal frameworks anticipating their use, formal electronic signatures (i.e. using encryption technology to provide authentication) remain the exception even in business use.²⁸ Finally, as Shamel mused in 2016, there is no longer a privacy justification for data localization rules.²⁹ From what we can see, the rapid development of information technologies inevitably leads to the transformation of social, legal, socio-economic relations. Institutions of digital contract and electronic digital signature are tools for ensuring the dynamics of civil turnover and means of protecting the subjective rights and interests of e-commerce participants who conclude transactions in electronic form.

Changes in the principles of organizing the economic structure that have occurred in our country today have necessitated not only a radical revision of the means of legal regulation of new economic relations, but also a change in the general legal understanding of the relevant legal institutions and the economic relations regulated by them. In this context of total digitalization of

²⁶ G.P. Kukhareva, *Forms of the transaction* [Кухарева Г. П. Форми правочину] Вісник Харківського національного університету права. 2006, pp. 298-302.

²⁷ С.М. Laborde, *Electronic Signature in International Contracts*, Peter Lang, 2010, pp. 77-78.

²⁸ A. Williams, D. Calow, A. Lee, *Digital Media Contracts*, OUP Oxford, 2011, p. 339.

²⁹ S. Azmeh, C. Foster, *The TPP and the digital trade agenda: Digital industrial policy and Silicon Valley's influence on new trade agreements*, Working Paper Series, 2016, p. 28.

commercial circulation, starting from the stage of pre-contractual consultations, including the conclusion of digital contracts and their implementation, one of the restraining factors in the development of this area of economic relations (and a key trend) is imperfect legal regulation of some aspects of law enforcement. Therefore, the process of digitizing documents must be comprehensive, with the obligatory harmonization of business practices in order to tolerate international experience.