Transparency as a legal value for patent disclosure

by **Daria Bohatchuk***

Abstract: This paper is dedicated to the assessment of transparency as a legal value in patent law, as well as in other areas of information flows. It outlines the essence and functions of transparency and, on this basis, proposes a genuinely new conception for assessing transparency. This conception is then applied to the patent system, more particularly to patent disclosure. It sheds new light on disputed issues such as the sufficiency of patent disclosure, the best mode requirement, and the disclosure of training data when patenting AI inventions.

Keywords: Transparency; patent disclosure; legal value; information

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A. Introduction

1 The era of innovations associated with computers has been christened the "Information Age" and has been made possible by a so-called "digital revolution".[1] Modern technologies have increased availability and accessibility of information, but have made the information more vulnerable towards potential infringements. The new ease with which information can be processed has significantly influenced the intellectual property (IP) sphere. Scientific and technological development keeps constantly challenging the established foundations of IP law.[2] Nowadays, the legal environment urgently needs the tools guaranteeing the quality of disseminated information and the legal foundations adjusted to modern reality.

2 This paper aims to look at transparency as a legal value that should ensure the quality of information and to consider the implementation of this value in patent law through patent disclosure. I first characterize transparency and propose a conception that allows one to assess implementation of transparency. This builds a foundation to consider patent disclosure in the light of transparency and suggests the means to strengthen the quality and availability of patent information. The paper outlines possible solutions to the issues of the best mode requirement and the requirement of disclosing training data when patenting artificial intelligence (AI). In general, legal research regarding transparency contributes to transformation of the said legal value into a principle of law, building the legal foundations in the areas of information flows.

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1 Helen Gubby, *Developing a Legal Paradigm for Patents* (Eleven International Publishing 2012) 295.

2 William Van Caenegem, *Intellectual Property Law and Innovation* (Cambridge University Press 2007) 22.

B. Essence and Functions of Transparency as a Legal Value

3 Legal responses to technological changes have a significant impact on the economy, the development of technologies, and social welfare.[3] Transparency requirements can be considered one of the responses to the challenges of the information age, when increase of accessibility and availability of information does not guarantee the quality thereof. This response shall be duly consolidated and integrated in law.

4 The scientific literature proposes different definitions and different approaches to understanding transparency.[4] However, the meaning of transparency depicted in the literature seems to be vague and unclear. It is admitted that transparency constitutes "a mental representation of a general idea"[5], which is difficult to define.[6] Although the notion of transparency is neither obvious, nor easy to access, the current state of critical transparency studies does not contribute much to the implementation thereof.[7]

5 In the literature, transparency is more and more often referred to as a legal principle[8] and even considered as a legal norm applied, in particular, by the EU institutions.[9] It is said that at the European level the transparency principle has developed from the principle of contract law into a general legal principle.[10] Transparency is sometimes qualified as a general principle of law under Article 38(1)(c) of the Statute of the International Court of Justice, although such qualification faces difficulties in reasoning.[11] Some authors consider transparency as a principle of specific branches of law, for example, as "an interpretative principle of international economic law".[12]

6 There are different views on the notion of "principles" in the literature. In a general sense, a principle is a beginning, a basis, a basic rule, a starting point, etc.[13] Black's Law Dictionary generally defines the "principle" as "a basic rule, law, or doctrine".[14] Ronald Dworkin proposes to perceive a principle as "a standard that is to be observed, not because it will advance or secure an economic, political, or social situation deemed desirable, but because it is a requirement of justice or fairness or some other dimension of morality".[15] Various opinions also exist concerning definition of the principles of law. The Legal Encyclopedia of the National Academy of Sciences of Ukraine defines the principles of law as "guiding foundations (ideas) that determine the content and direction of legal regulation of social relations".[16] The Ukrainian scholar Olga F. Skakun offers the following definition of the principles of law:

3 Roger Brownsword, *The Oxford Handbook of Law, Regulation, and Technology* (1st edn, Oxford University Press 2017) 225.

4 Black's Law Dictionary proposes the following definition of transparency: "Transparency. Openness; clarity; lack of guile and attempts to hide damaging information. The word is used of financial disclosures, organizational policies and practices, lawmaking, and other activities where organizations interaction with the public", Henry Campbell Black and Bryan A Garner, *Black's Law Dictionary* (8th edn, Thomson West 2004) 1537.

5 Andrea Bianchi and Anne Peters, *Transparency in International Law* (Cambridge University Press 2013) 6.

6 ibid 7, 8.

7 See Christopher Hood and David Heald, *Transparency: The Key to Better Governance?* (Oxford University Press 2006); Emmanuel Alloa and Dieter Thomä, 'Transparency: Thinking Through an Opaque Concept' in Emmanuel Alloa and Dieter Thomä, *Transparency, Society and Subjectivity: Critical Perspectives* (1st edn, Springer International Publishing 2018).

8 Anoeska Buijze, *The Principle of Transparency in EU Law* (Utrecht University, Uitgeverij BOXPress 2013) 73 <www.researchgate.net/publication/316284186_The_Principle_of_Transparency_in_EU_Law> accessed 11 November 2022.

9 ibid 264.

10 GH Addink, 'The Transparency Principle in the Framework of the WTO' (2009) 6(2) *Indonesian Journal of International Law* 232, 237, 239.

11 Bianchi, Peters (n 5) 5.

12 Carl-Sebastian Zoellner, 'Transparency: An Analysis of an Evolving Fundamental Principle in International Economic Law'(2006) 27(2) MICH J INT'L L 579, 627.

13 Дар'я Богатчук, 'Принцип Добросовісного Виконання Міжнародних Зобов'язань' (Дисертація на здобуття наукового ступеня кандидата юридичних наук, Інститут законодавства Верховної Ради України 2018) 55 (Daria Bohatchuk, 'Principle of Fulfilment in Good Faith of International Obligations' (DLaw thesis, Institute of Legislation of the Verkhovna Rada of Ukraine 2018) 55).

14 Henry Campbell Black and Bryan A Garner, *Black's Law Dictionary* (8th edn, Thomson West 2004) 1231.

15 Ronald Dworkin, *Taking Rights Seriously* (Harvard University Press 1977) 22.

16 Юридична Енциклопедія (ЮС Шемшученко голов ред, Інститут держави і права ім ВМ Корецького 2003) т 5, 128 (*Legal Encyclopedia* (YS Shemshuchenko ed, VM Koretsky Institute of State and Law 2003) vol 5, 128).

"generally accepted norms-ideas of the highest authority, which serve as the main foundations of legal regulation of social relations, direct their participants to establish social compromise and order".[17] The Ukrainian scholars Leonid D. Tymchenko and Valerii P. Kononenko point out that the basic principles of international law are universally recognized norms of the highest order, which form the foundation of international law and should ensure the effective and stable functioning of the international system.[18] The need to recognize certain provisions as principles is inherent in both national and international law.[19] The basic principles of international law are the foundational elements in the structure of international law. Some authors propose to see the purpose of Art. 38(1)(c) of the Statute of the International Court of Justice in ensuring that international law includes rules and principles common to all legal systems, as they form a part of the structure of "the law".[20]

7 Despite of the value-based character of the principles of law, these principles constitute basic legal rules and thus possess normative power. While transparency is considered a principle in some legal acts[21], it cannot be concluded that transparency, today, is an established principle of law that serves as a basic legal rule. Rather, transparency is seen as "developing" or "emerging" and is "usually described as if it were in statu nascendi, a potential that has not yet turned into actuality".[22] Indeed, transparency is in the process of development and transformation into a principle of law. The legal consolidation and scientific attention to transparency contribute to its establishment as a legal principle. At that, the need for transparency can be legally justified and legitimized.

8 The philosophy of law is a part of a tradition of inquiry that began with Socrates and that is characterized by a desire to understand human values.[23] Nowadays, transparency is considered as a significant public good and as an universally recognized value in the modern society (the so called "zeitgeist"[24]). A value may be defined as "a moral or ethical proposition: an abstraction, an ideal which we may believe in".[25] In general, values have a complicated relationship with virtues, which relate to personal traits and may be characterized as an "operative habit" in the language of Aquinas and a "disposition to act" in the language of Aristotle.[26] In order to show the distinction between the values and virtues authors propose the following example of dual questions: "do you believe in honesty?" (for honesty as one of the societal values) and "are you honest?" (for a virtue).[27] It may be said that it is one of the functions of law to incentivize that the virtues, i.e. the practice, correspond to the values.

9 Against this background, we can understand transparency as a value of the modern information world, a legal value in the fields of law that are directly connected with information. The legal values can

17 Ольга Ф Скакун, Теорія Права і Держави (4 вид, Правова єдність, Алерта 2014) 242 (Olga F Skakun, *Theory of Law and State* (4th edn, Pravova Yednist, Alerta 2014) 242).

18 Леонід Д Тимченко, Валерій П Кононенко, Міжнародне Право (Знання 2012) 89 (Leonid D Tymchenko, Valerii P Kononenko, *International Law* (Znannia 2012) 89).

19 Bohatchuk (n 13) 56.

20 Martin Dixon, *Textbook on International Law* (7th edn, Oxford University Press 2013) 43.

21 Under the General Data Protection Regulation (GDPR), which lays down the EU rules relating to the protection of natural persons with regard to processing of personal data, the principle of transparency is one of the basic data processing principles. Recital 58 of the GDPR explains: "The principle of transparency requires that any information addressed to the public or to the data subject be concise, easily accessible and easy to understand, and that clear and plain language and, additionally, where appropriate, visualisation be used. Such information could be provided in electronic form, for example, when addressed to the public, through a website (...)", Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) [2016] OJ L119/1. Also in some other legal acts, transparency is considered as a principle, for example in Article 76 of the Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC, stating that "Member States shall put in place national rules (...) in order to ensure contracting authorities comply with the principles of transparency and equal treatment of economic operators", Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC [2014] OJ L094/65.

22 Bianchi, Peters (n 5) 6.

23 George Duke, *The Cambridge Companion to Natural Law Jurisprudence* (Cambridge University Press 2017) 256.

24 Bianchi, Peters (n 5) 595.

25 Rainer Hofmann, *Law Beyond the State: Pasts and Futures* (Campus Verlag 2016) 107.

26 ibid.

27 ibid.

be considered as the benchmarks or the ideals that law seeks to serve (for example, peace and security, good governance).[28] Transparency may also be a virtue, a qualitative characteristic of the information. What is so interesting about transparency is that, being a value, it is also a tool which contributes to guaranteeing adherence to other values and purposes of society.

10 Transparency is said to be subservient and instrumentally rational towards other values.[29] Transparency is a tool for the efficiency and effectiveness of the democratic legal order. It is considered as a tool for such basic legal values as participatory democracy, accountability of public authorities, good governance, the legitimacy of decision-making[30] and for the rule of law principle. Transparency is called "an indispensable element of any accountability framework".[31] At the same time, taking into consideration the circle interconnections within the legal field, transparency finds its own application through the basic values, which are needed for the effective implementation of transparency. Transparency finds its application through the human right to information, access to justice and other legal aspects. In the patent sphere, transparency may be considered as a driving force in the functioning of the patent market. At the same time, transparency is being promoted by patent rights themselves (for example, disclosing information about inventions is encouraged by patent protection).

11 Although the legal nature and functions of transparency should become an object of scientific attention in a separate work, this paper would like to contribute to the general understanding of transparency as a legal value and to assessing implementation of transparency. The following conception of transparency is, therefore, proposed.

C. Assessing Transparency

12 First of all, it is important to define what should be transparent, i.e. what is the object of transparency. Although the term "transparency" is often used with respect to institutions, procedures, facts, etc., transparency essentially aims at information. Therefore, it finds application in the areas of information flows (different data, personal and non-personal; public and private information). Transparency with respect to institutions, procedures (public authorities, decision-making), etc. also means assessing the information aspect.

13 Further, I depict the elements that allow an assessment of transparency from the theoretical point of view, as well as to gauge the implementation of transparency in practical cases.

I. Alignment with the Purposes

14 Taking into consideration the subservient character of transparency, this legal value should guarantee non-violation of the purposes of the law within the information flows. Therefore, transparency has to lead to or needs to be aligned with the purpose of the respective legal system or legal area (the main aims of the legal regulation which depend on the area; for example, in patent law that will be the purpose of the patent system). The question to be asked is whether information has been impacted by the respective subjects in a way that precludes achievement of the purpose of the legal system/area (for example, insufficient disclosure with respect to the patented invention). When dealing with the intersections of the purposes of different legal systems or legal areas involved in regulation of the relations towards information, one should aim at establishing the balance between the said purposes and should resort to the principles of law, in particular, to the so-called peremptory "jus cogens" norms that are hierarchically superior. Therefore, the implementation of transparency in respect of information should be carried out taking into account, for example, the privacy requirements applicable to such information.

15 Transparency aims at establishing a "fair balance" in the information field, in particular, through reduction of the information asymmetries between obligees and beneficiaries of information. The necessity of balancing arises from a conflict between competing rights, interests, principles, values[32] or purposes. For example, full and correct information provided by a licensee and a licensor within the license transaction reduces the information asymmetry between them.

28 Definition of the legal values has not received proper scientific attention. For consideration of the notion of the legal values, see Georg Meggle, *Actions, Norms, Values: Discussions with Georg Henrik von Wright* (De Gruyter 2011); Peter Stein, John Shand, *Legal Values in Western Society* (Edinburgh Univ Press 1974).

29 Bianchi, Peters (n 5) 5, 225.

30 ibid 8.

31 Timo Rademacher and Thomas Wischmeyer, *Regulating Artificial Intelligence* (Springer 2020) 77.

32 Massimo Durante, 'Dealing with Legal Conflicts in the Information Society. An Informational Understanding of Balancing Competing Interests' (2013) 26 Philos Technol 437, 440 <https://doi.org/10.1007/s13347-013-0105-z> accessed 11 November 2022.

Patent information, which is sufficiently disclosed in a patent application in line with transparency, also constitutes an example of reduction of the information asymmetries. The transparency obligees have a certain level of control over the relevant information.[33] The beneficiaries of transparency are the recipients/potential recipients of information who either receive information or seek it (in fact or potentially).

16 For reduction of the information asymmetries between the parties, more information may be needed. However, transparency does not automatically require greater amount of information (unless there are legislative provisions thereon), it puts forward the qualitative characteristics of information, depending on the respective legal environment. The need in reduction of the information asymmetries is not absolute and the benchmark for the extent of such reduction can again be found in the purposes of the legal systems / areas. Herewith, this benchmark serves not only for the aim of achievement of the purposes, but also for preventing requirements of disclosure of too much of information, which is not needed for achievement of these purposes.

17 Transparency, which contributes to the realization of the purposes of the legal systems and to the establishing balance, should be an essential element of all legal relations in connection to information.

II. Good Faith

18 Assessing transparency of information includes the detection of the abuse of rights, unfair practice, creating any "smoke screens", and other actions or omissions that can preclude achievement of the purposes of the legal systems. This aspect is tightly connected with good faith in behavior towards information.

19 Good faith in behavior constitutes a qualitative characteristic of the way of fulfilment of the respective obligations. Black's Law Dictionary defines "good faith" as follows: "A state of mind consisting in (1) honesty in belief or purpose, (2) faithfulness to one's duty or obligation, (3) observance of reasonable commercial standards of fair dealing in a given trade or business, or (4) absence of intent to defraud or to seek unconscionable advantage".[34] The said dictionary also proposes the definition of "bona fide": "[Latin 'in good faith'] 1. Made in good faith; without fraud or deceit. 2. Sincere; genuine".[35]

20 Good faith anticipates that the respective obligations should be performed "to the best of the ability of the party"[36], not only in accordance with the letter of the relevant stipulations, but also in accordance with their spirit.[37] Furthermore, the behavior of the obligees aimed at fulfilment of their obligations must not defeat the purpose of the legal rules stipulating these obligations.[38] Thus, for assessing the good faith aspect of transparency, it should be considered, in particular, whether the respective obligations of the transparency obligee concerning information are fulfilled at the obligee's best.

21 As a tool that ensures the quality of the respective information, transparency should be a guarantee of a good faith environment in the information world, where the choices are often made quickly based on the respective information. Transparency may be even considered as the informational dimension of bona fide, as the dimension of good faith in the sphere of information.

III. Legal Requirements of Transparency

22 A crucial role in the implementation of transparency is played by consolidation of the respective requirements in legal acts. The following legal prescriptions should be considered as the legal requirements regarding transparency:

- clearness, completeness and comprehensibility of information;
- availability and accessibility of information.

23 If the mentioned requirements are enshrined in

33 A state seems to be a classical obligee in respect of transparency. The behavior of the representatives of a state should be well regulated within the legal norms containing the levers for balancing the state powers (in particular, the transparency rules) and should be aimed, inter alia, on fulfilment of the public interest (in particular, implementation of transparency). However, the private actors can also be the transparency obligees, when they have control over information and when there are / is the recipients / recipient or the potential recipients / recipient of such information.

34 Campbell Black, Garner (n 14) 713.

35 ibid 186.

36 'Article 20. Pacta sunt servanda' (1935) 29 The American Journal of International Law 977, 981.

37 ibid.

38 II Lukashuk, 'The Principle Pacta Sunt Servanda and the Nature of Obligation Under International Law' (1989) 83(3) The American Journal of International Law 513, 515.

law, transparency should be assessed, in particular, through establishing whether the respective information fulfills these requirements.

24 In cases when the need of transparency may be assumed according to the spirit of the legal regulation or due to the peculiarities of the respective legal area, the amendments establishing the legal requirements on clearness, completeness, comprehensibility, availability and accessibility of information should be proposed.

25 Taking into consideration the important functions of transparency in the areas of information flows, further consolidation of the respective legal rules on transparency in the legal framework need to be suggested. Recognition and greater integration of transparency in legislation will effectively promote implementation of the said value.

26 Implementation of transparency, as proposed in this paper, will, of course, require additional effort and cost on the part of the transparency obligees. However, taking into account the value-based nature of transparency and its fundamental role for the realization of other societal values, the practical measures to increase transparency discussed further in the paper seem reasonable and feasible. Transparency is beneficial both to the transparency beneficiaries and the transparency obligees, as well as to society as a whole. Patent disclosure is an example of how the additional costs and efforts required from the transparency obligee (in particular, the patent applicant) for the sake of transparency of patent information result in mutual benefit to the parties. Although the patent applicant incurs additional time and resources to provide patent information that is of quality and availability consistent with transparency, the applicant also benefits from such good faith behavior, in particular from a clear establishment of the subject matter of the patent, and, therefore, a clear and reliable scope of patent protection. In turn, the transparency beneficiaries in the patent system gain access to truly valuable technological information that can be used for further innovation. All of society benefits from an environment favorable for further technological progress and good faith relations within the patent system.

D. Assessing Transparency of Disclosed Patent Information

27 The legal system of intellectual property rights allows market and non-market forces to operate for informational goods.[39] Intellectual property rights modify knowledge flows and persuade individual actors not to hide and not to deny access to knowledge.[40] Patents, for example, give the incentive to share technical knowledge with the public through filing for a patent instead of keeping it secret.[41] Disclosure of the invention to the public is a condition for obtaining a patent which grants the rights to exclusively make, use and sell the invention for a certain period of time.[42] Due to the public disclosure of the content of a patent,[43] other innovators obtain access to the most recent advances in technology and, therefore, can contribute to further improvements,[44] design around or be inspired by the invention during the patent term and use it fruitfully after the patent term expires.[45] Patent disclosure, therefore, constitutes a core tool for legal modification of information sharing within the patent system.

28 The patentee discloses the invention and the respective technical information with the legal instrument called "patent application".[46] In general, a patent application contains a request for the grant of a patent, one or more claims, a description of the invention, one or more drawings (if necessary) and an abstract,[47] but national patent laws may also

39 Dominique Guellec and Bruno van Pottelsberghe de la Potterie, *The Economics of the European Patent System: IP Policy for Innovation and Competition* (Oxford University Press 2011) 2.

40 Van Caenegem (n 2) 6.

41 Henrik Timmann and Maximilian Haedicke, *Patent Law: a Handbook on European and German Patent Law* (CH Beck 2014) 5.

42 Carlos María Correa, Peter Drahos, and Frederick M Abbott, *Emerging Markets and the World Patent Order* (Edward Elgar 2013) 62.

43 Toshiko Takenaka, *Patent Law and Theory: a Handbook of Contemporary Research* (Elgar 2008) 144-45.

44 Martin J Adelman, Randall R Rader, and Gordon P Klancnik, *Patent Law in a Nutshell* (Thomson/West 2008) 6, 189.

45 Jeanne C Fromer, 'Patent Disclosure' (2009) 94 Iowa Law Review 539, 541 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1116020> accessed 11 November 2022.

46 Nefissa Chakroun, *Patents for Development: Improved Patent Information Disclosure and Access for Incremental Innovation* (Edward Elgar Publishing 2016) 15.

47 World Intellectual Property Organization, Standing Committee on the Law of Patents, 'Dissemination of Patent Information' (SCP/13/5 2009) 2, 11 <www.wipo.int/edocs/mdocs/scp/en/scp_13/scp_13_5.pdf> accessed 11 November 2022.

contain some other requirements[48] (for example, some countries require an applicant to submit prior art information known to the applicant or to submit the information concerning the applicant's corresponding foreign applications and grants).[49] Other information relating to the patent application, for example, power of attorney, a priority claim, a declaration of inventorship, a non-prejudicial disclosure statement or a document regarding the applicant's entitlement, may be filed with the request or submitted separately, depending on the applicable law.[50] The terms used in legal acts concerning patent disclosure may differ: description, specification, claims or patent application in general. For the purposes of this paper, the term "patent information" is used for information disclosing the invention within the patenting procedure. Patent information has dual nature, being not just technical information, but also legal information about the applicable territory, the term and the scope of protection, the ownership of rights,[51] etc.

29 Published patents (and patent applications in many countries) constitute an important source of technical information.[52] However, valuable information about the inventions can also be effectively disclosed in other ways than through patents.[53] According to a theory of peripheral disclosure, technical information about the inventions can be disclosed not only in the patent document itself, but also outside the confines of the patent.[54] An author of this theory, Professor Jason Rantanen, recognizes that patents free (rather than force) inventors to share technical information and that the latter willingly share such information, but might not provide it in the absence of a patent system that retains the ability to monetize the invention.[55] In this context, patents are said to serve a crucial role in facilitating contracting[56] and provide a solution to the Arrow information paradox,[57] according to which in the absence of special legal protection, an owner cannot sell information on the open market, because the disclosure of such information within the selling process the purchaser can destroy the monopoly and reproduce the information at little or no cost.[58] Taking into consideration the criticism that relates to patents concerning their lack of useful information and their failure to transfer tacit knowledge, technological information shared about the inventions in a form other than the patent document (for example, scientific publications by patenting inventors, information shared for marketing purposes or revealed within commercialization of the invention and licensing transactions, self-disclosing inventions)[59] can form an effective supplement for promoting the progress and reinvigorating the disclosure function of the patent system.[60] Professor Colleen V. Chien argues that we need to rethink and broaden the concept of patent disclosure in order to encompass not only the content of the patent, but also its contextual information.[61] The proposed conception of transparency should cover not only patent information disclosed in the patent document, but also peripheral disclosure and disclosure of the contextual information. At the same time, the subject of this paper covers mainly patent disclosure as a part of the patenting procedure.

48 Chakroun (n 46) 15.

49 WIPO, 'Dissemination of Patent Information' (n 47) 12.

50 ibid 11.

51 WIPO, 'Dissemination of Patent Information' (n 47) 2.

52 ibid.

53 Jason Rantanen, 'Peripheral Disclosure' (2012) 74 U Pitt L Rev 1, 16.

54 ibid 6, 7, 15, 16.

55 ibid 7, 15, 16, 19.

56 Robert Merges, 'A Transactional View of Property Rights' (2005) 20 Berkeley Tech L J 1477, 1504, 1519.

57 Colleen V Chien, 'Contextualizing Patent Disclosure' (2019) 69 Vanderbilt Law Review 1849, 1871.

58 Kenneth J Arrow, 'Economic Welfare and the Allocation of Resources for Invention' in National Bureau of Economic Research, *The Rate and Direction of Inventive Activity: Economic and Social Factors* (Princeton University Press 1962) 615.

59 Rantanen (n 53) 13, 14, 16, 19, 20, 21, 23.

60 Chien (n 57) 1876.

61 ibid 1849, 1853, 1867; as Professor Colleen V. Chien states, contextual information includes (a) intrinistic characteristics of a patent regarding the number of claims, the prior art citations, the time spent in prosecution, the original owner of record, and related patents; (b) "acquired" characteristics of the patent concerning changes in patent ownership, size and other traits of the owner that entitle to pay reduced fees, investments in the patent, correction, reissue or re-examination of the patent, financing events involving the patent, citation to the patent, post-grant challenges to the patent, and licensing of the patent; (c) disclosures outside of the patent office: court disclosures, regulatory disclosures, and marking disclosures; (d) information within the international patent system, in particular, regarding where else in the world the patent is filed; (e) information outside the patent but still associated with the patent: standards that the patent is included in, commitments to license patents on royalty-free or RAND terms, patent pledges, etc., ibid 1876, 1877, 1878, 1879, 1890.

30 The patent system induces transparency through patent disclosure. Patent law then protects this transparency, as patents can be used for the legal protection of highly transparent and easy-to-comprehend subject matter.[62] The general trend of demanding greater transparency in different spheres, including the financial system, will push innovations into patenting and will increase the demand for patents.[63] At the same time, many practical problems of the patent system are connected with transparency, such as the issues of sufficiency of patent disclosure, availability of patent information in patent registers, determining inventors, etc. These controversial issues of patent law indicate that there is a lack of solid theoretical foundation for solution.

31 This paper contributes to theoretical consideration of transparency as a legal value with the purpose of improvement of its practical implementation within patent disclosure. I believe that the enhanced integration of this value into patent law will facilitate establishing due balance and finding adequate solutions to existing problems. I start by considering the purpose of the patent system as a benchmark for assessing transparency.

I. Alignment with the Purpose of the Patent System

1. Purpose of the Patent System and the Scope of Patent Disclosure

32 There are various approaches to justification of the patent system and establishing its purposes, in particular the natural rights and utilitarian theories.[64] According to the disclosure theory, which is one of the variations of the utilitarian argument, the patent system is justified on the ground that it encourages the disclosure of information about the invention in the patent document[65] by imposing a requirement of patent disclosure in exchange for the temporary monopoly (patent) granted to the inventor.[66] According to this theory, the patent system encourages the disclosure of technical information that would otherwise be kept secret.[67] At the same time, patent disclosure stimulates future innovation.[68] According to the theory of the incentive to invent justification[69], patents can be seen as a very special type of "contract", or a promise of society to inventors to grant them some exclusive patent rights if they come up with inventions[70], which would likely never have been created or would have been created at a much later time but for existence of the patent system.[71] Within the patent system, the inventor obtains control over the economic benefits from the invention and may recover research costs and accumulate funds for other innovation projects.[72] Thus, patents give the incentive for inventors and companies to invest in acquisition of inventions and to share knowledge with the public through filing for a patent.[73] The thesis that the patent system spurs investment in research[74], produces effective incentives for inventing and thereby stimulate technological progress forms the core of one of the foundational theories of the patent system and is often regarded as the fundamental economic justification of patents.[75] Fostering innovation and growth[76], encouraging the diffusion of technology through an economic mechanism can be regarded as a purpose of the patent system.[77]

33 Patent disclosure is a central tool of the patent system for encouraging further innovation. Under patent law, the scope of exclusive rights and legal protection of invention should correspond to the

62 John F Duffy and John A Squires, 'Disclosure and Financial Patents: Revealing the Invisible Hand' (Suomen Pankki 2008) 23 <www.suomenpankki.fi/globalassets/en/research/seminars-and-conferences/conferences-and-workshops/documents/cepr2008/cepr2008_duffysquires_paper.pdf> accessed 11 November 2022.

63 ibid 4, 33.

64 Guellec, Van Pottelsberghe de la Potterie (n 39) 46.

65 Rantanen (n 53) 4.

66 Guellec, Van Pottelsberghe de la Potterie (n 39) 50-51.

67 Chien (n 57) 1851.

68 Fromer (n 45) 541.

69 Rantanen (n 53) 10.

70 Guellec, Van Pottelsberghe de la Potterie (n 39) 51.

71 Rantanen (n 53) 10.

72 Adelman, Rader, Klancnik (n 44) 4.

73 Timmann, Haedicke (n 41) 5.

74 Rantanen (n 53) 10.

75 Fritz Machlup, 'An Economic Review of the Patent System' (Study of the Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary, United States Senate, US Government Printing Office 1958) 33.

76 Guellec, Van Pottelsberghe de la Potterie (n 39) 3.

77 ibid 3, 42.

scope of patent disclosure[78] and should be justified by the technical contribution to the art.[79] Pursuant to the Guidelines for Examination in the European Patent Office,"[a] fair statement of claim is one which is not so broad that it goes beyond the invention nor yet so narrow as to deprive the applicant of a just reward for the disclosure of his invention".[80] Thus, defining the minimum inventive content that justifies the grant of a patent[81] is a key issue of patent law. The conception of transparency, proposed in this paper, may contribute to solution of this issue.

34 Transparency defines the quality of the disclosed patent information. Pursuant to the transparency conception, which links disclosure of information and the purposes of the legal systems (see above)[82], the scope of patent disclosure should be such that it achieves the incentive purpose of the patent system. Therefore, the grant of a patent in exchange for the disclosure of patent information that is not sufficient to use it for further innovative activity does not correspond to transparency. The practical question of the sufficient inventive content justifying the grant of a patent[83] can also be the following: how to define the scope of disclosure that corresponds to transparency?

35 Patent information, which is sufficiently disclosed in a patent application, constitutes an example of reduction of the information asymmetries between patentees and observers[84], as well as between inventors or applicants and the patent office. According to the mentioned transparency conception, more information may be required for mitigation of the information asymmetries between the parties (see above).[85] However, increasing the quantity of the disclosed patent information does not automatically induce transparency of that information, as it does not mean that this information can be effectively used for further innovative development. Mere disclosure of the patent information does not justify the social bargain, as society shall receive something useful from the point of view of further technological progress.

36 According to the proposed transparency conception (see above),[86] information asymmetries regarding patent disclosure need to be reduced as long as this is in line with the purpose of the patent system, which is incentivizing innovations. Patent disclosure should be such that this purpose can be achieved, but there is no need in disclosure of "too much" of information. From this point of view, for example, introduction of the legal requirement of "economic enablement"[87] can't be justified by the purpose of encouraging innovations, as such requirement anticipates the scope of disclosure, which exceeds the extent that is sufficient for achievement of this purpose. Under the "economic enablement" requirement, proposed in the literature in a parallel to the technical enablement requirement, patent disclosure should include sufficient minimum of information for economical exploitation of the invention upon expiration of the patent term.[88] The said scope of disclosure, when required, may reduce innovation incentives[89] and does not seem to be suitable for incorporation in patent law.

37 Patents not only contain valuable technical information about inventions, but also cause and encourage peripheral disclosure or disclosure of contextual information shared in other ways than through patents.[90] The amount and availability of information disseminated within such non-patent sharing should be determined by the purposes of the respective legal systems or legal areas involved in regulation of the relations towards such information.

78 Adelman, Rader, Klancnik (n 44) 7.

79 T 435/91 *Detergents* [1995] OJ EPO 188, para 2.2.1; EPO, *Guidelines for Examination in the European Patent Office* (EPO 2022) pt F, ch IV, para 6.1 <www.epo.org/law-practice/legal-texts/html/guidelines/e/f_iv_6_1.htm> accessed 14 November 2011.

80 EPO, *Guidelines for Examination in the European Patent Office* (EPO 2022) pt F, ch IV, para 6.2 <www.epo.org/law-practice/legal-texts/html/guidelines/e/f_iv_6_2.htm> accessed 14 November 2011.

81 William Cornish and others, *Intellectual Property: Patents, Copyright, Trademarks and Allied Rights* (7th edn, Sweet & Maxwell 2010) 148.

82 para 14.

83 Cornish and others (n 81) 148.

84 Clarisa Long, 'Patent Signals' (2002) 69(2) *University of Chicago Law Review 625,* 627-28.

85 para 16.

86 para 16.

87 W Nicholson Price II, 'Expired Patents, Trade Secrets, and Stymied Competition' (2017) 92 Notre Dame L Rev 1611, 1613.

88 ibid 1611, 1613, 1614.

89 ibid 1632, 1633.

90 Rantanen (n 53) 6, 7, 16, 34; Chien (n 57) 1849.

2. Purpose of the Patent System and Patent Disclosure of AI

38 An alignment with the purposes in practice may be considered on the example of AI[91] being patented. AI-related inventions can be classified to the following types: (1) inventions of AI technologies that are created by humans for improvement of AI technologies themselves; (2) AI-generated inventions that are created by humans with the help of AI as a tool; (3) AI-assisted inventions that are generated by AI with possible human contribution.[92] For the purpose of this paper, I will focus on the first type of the inventions and will use the term "AI inventions" to refer to them.

39 AI systems[93] have an increasing impact on our lives, but also cause unsolved challenges to transparency and disclosure in patent law.[94] The disclosure challenge and the lack of transparency of AI is particularly connected with the difficulties to interpret and explain how AI systems operate.[95] Increasing complexity of AI models urgently raises the issue of sufficiency of disclosure of the AI inventions,[96] which anticipates the problems of unclear and incomplete disclosure of AI in patent applications, as well as the problems of very broad patent claims. In addition, more and more inventions are based on AI-generated output produced with the use of AI-based tools, but the assistance of AI in the invention process is not disclosed and due to the lack of transparency it is difficult to understand what method produced the particular output, and it may appear that it was invented by humans.[97] At that, the patent disclosure requirements also constitute challenges to innovators wishing to obtain a patent regarding AI, as within the patent prosecution process they need to disclose important details which otherwise could have been kept secret.[98]

40 In view of the social and ethical reasons for the need of more transparency in AI, the special relevance is assigned to the research for creating AI models that are able to explain themselves, or to take decisions that can be explained to people ("explainable AI").[99] In general, it should be mentioned that the patent system encourages the creation of self-disclosing inventions[100] and therefore anticipates incentives for investment in the development of explainable AI.

41 Today, the requirements within the examination of patent applications related to AI inventions differ in different jurisdictions, such as the USPTO and the European Patent Office (EPO).[101] Generally speaking, AI inventions may be patented in the EPO[102] and in the USPTO if the respective requirements are met. According to the EPO, an AI invention can be patentable in case the claimed technical features are inventive, in case AI technology is used for a technical purpose.[103] At that, the claimed AI-related features as such are not deemed to be technical (being mathematical in nature) and are considered for an inventive step only if they support a technical effect

91 In simple words, AI may be defined as "the ability of a machine to display human-like capabilities such as reasoning, learning, planning and creativity", 'What is Artificial Intelligence and How Is It Used?' (*European Parliament*, 29 March 2021) <www.europarl.europa.eu/news/en/headlines/society/20200827STO85804/what-is-artificial-intelligence-and-how-is-it-used> accessed 12 November 2022.

92 Jyh-An Lee, Reto M Hilty, and Kung-Chung Liu, *Artificial Intelligence and Intellectual Property* (1st edn, Oxford University Press 2021) 100.

93 An "AI System" can be defined as a computer environment applying AI and can also be described as "a structured contextualized combination of 'AI techniques' with the goal of attaining artificial intelligence", Alfred Früh and Dario Haux, 'Foundations of Artificial Intelligence and Machine Learning' (2022) 29 Weizenbaum Series 1, 4, 5 <https://edoc.unibas.ch/89766/1/20220912105400_631ef3a8beb27.pdf> accessed 21 November 2022.

94 Tabrez Y Ebrahim, 'Artificial Intelligence Inventions & Patent Disclosure' (2020) 125 Penn St L Rev 147, 148, 150, 153, 155, 157.

95 ibid 170, 174, 179.

96 Harm van der Heijden, 'AI Inventions and Sufficiency of Disclosure – When Enough Is Enough' (*IAM*, 3 October 2019) <www.iam-media.com/global-guide/iam-yearbook/2020/article/ai-inventions-and-sufficiency-of-disclosure-when-enough-enough> accessed 11 November 2022.

97 Ebrahim (n 94) 161, 170.

98 Clark D Asay, '*Artificial Stupidity*' (2020) 61(5) Wm & Mary L Rev 1187, 1207, 1209, 1222.

99 Matt Hervey and Matthew Lavy, *The Law of Artificial Intelligence* (1st edn, Sweet & Maxwell 2021) 297.

100 Rantanen (n 53) 31, 32.

101 Ryan N Phelan, 'A Tale of Two Jurisdictions: Sufficiency of Disclosure for Artificial Intelligence (AI) Patents in the U.S. and the EPO' (*PatentNext*, 1 November 2021) <www.patentnext.com/2021/11/a-tale-of-two-jurisdictions-sufficiency-of-disclosure-for-artificial-intelligence-patents-in-the-u-s-and-the-epo/> accessed 11 November 2022.

102 ibid.

103 Van der Heijden (n 96).

or technical goal.[104] The USPTO classifies patents relating to AI in the USPC generic class 706 "Data Processing – Artificial Intelligence".[105] The Alice/Mayo test[106], which is extensively applied in the United States, requires determination of whether (1) a fundamental AI algorithm, being a mathematical concept, can be considered as an abstract idea, which is not eligible for patenting, and then whether (2) the respective claim can still be eligible for patenting[107] in case "the claim, as a whole, integrates the recited judicial exception into a practical application of that exception".[108] In the recent report "Public Views on Artificial Intelligence and Intellectual Property Policy", the USPTO emphasizes that three disclosure requirements[109] envisaged by 35 U.S.C. § 112(a) "apply to all applications examined before the USPTO, including those directed to AI inventions".[110]

42 Under the provisions of patent law, it is necessary to disclose sufficient details[111] of the claimed AI invention, so that it can be repeatedly implemented by a person skilled in the art.[112] In view of the necessity of alignment with the purposes of the legal systems or areas under the above conception of transparency, the patent disclosure of the AI inventions should be sufficient for the potential usage of the disclosed data for further innovations. This means that the expression of AI within the patent system should adhere to the purpose of this system. Such an approach should define the vector of legislative development and the fundamental basis for an environment which is constantly challenged by new technologies. Hence, the legal requirements on the increased disclosure of AI in patents should serve the purpose of incentivizing innovations. At the same time, for example, very abstract description of the AI-related process in the patent claims may bring about very broad protection by the patent granted for such claims and, thus, stifle innovation by blocking any other use of the said process even for a different purpose.[113]

43 The following threshold of patent disclosure regarding the AI inventions may be suggested: in addition to an adequate and clear description of the basic model, either (1) a description of the method of training of the model, including a reference to the training data, or (2) every learned coefficient or weight of the trained model need to be disclosed.[114] The second option might be enough for reproducing a particular embodiment of the invention by the skilled person, however it is not enough for its improvement.[115] Thus, in order to reach the incentive purpose of the patent system, disclosure of the method of training and the training data is recommended.[116] However, disclosure of the training data of an AI invention may be complicated by the following issues: (1) very large amount of data (for example, thousands or even millions of images), which makes a proposition to include the respective datasets to the patent applications not workable; (2) a significant effort needed from an applicant to gather and (for example, in case of supervised learning) to label the training data; (3) unwillingness of the applicant to make the training data publicly available because they are deemed trade secrets and their use by competitors would be detrimental to the applicant[117]; (4) no consent to make the training data publicly available from the third parties that hold

104 ibid.

105 Lee, Hilty, Liu (n 92) 79.

106 USPTO, *2019 Revised Patent Subject Matter Eligibility Guidance* [2019] 84 FR 50 <www.govinfo.gov/content/pkg/FR-2019-01-07/pdf/2018-28282.pdf> accessed 11 November 2022 (USPTO, *Patent Eligibility Guidance*).

107 Van der Heijden (n 96).

108 USPTO, *Patent Eligibility Guidance* (n 106) 50.

109 Edwin D Garlepp, 'Disclosing AI Inventions - Part I: Identifying the Unique Disclosure Issues' (*Oblon*, 9 April 2021) <www.oblon.com/disclosing-ai-inventions-part-i-identifying-the-unique-disclosure-issues> accessed 11 November 2022.

110 USPTO, 'Public Views on Artificial Intelligence and Intellectual Property Policy' (2020) 9 <www.uspto.gov/sites/default/files/documents/USPTO_AI-Report_2020-10-07.pdf> accessed 11 November 2022.

111 According to the recent decisions of the European Patent Office's Boards of Appeal (T161/18 from May 2020, T1191/19 from May 2022), a lack of details in the description of the AI inventions as to how to carry out the invention and how AI Systems solve the respective problem, may lead to a finding of insufficient disclosure and lack of inventive step, Christopher Smith, 'Artificial Intelligence, Insufficiency and Inventive Step: Detailed Disclosure Needed at the EPO' (*Reddie&Grose*, 19 May 2022) <www.reddie.co.uk/2022/05/19/artificial-intelligence-insufficiency-and-inventive-step-detailed-disclosure-needed-at-the-epo/> accessed 13 November 2022.

112 Hervey, Lavy (n 99) 294.

113 Lee, Hilty, Liu (n 92) 353-54.

114 Van der Heijden (n 96).

115 ibid.

116 ibid.

117 ibid.

rights to such data. All these reasons contribute to the fact that patent applicants prefer to provide a description of the training method, while omitting the training data.[118]

44 There are proposals for legislative amendments envisaging a data deposit requirement or a publicly accessible repository as part of the applicant's disclosure of AI (similar to the respective legal requirements for plant seeds).[119] In this vein, the developers of machine learning products could be required not only to provide the detailed description of the training process but also to put the training data and/or the trained machine learning models into a dedicated repository.[120] Building and maintaining such training data or model repositories within the patent offices may, however, not only be difficult from a technical point of view but also be challenging because of the unwillingness of the patent applicants to give away valuable data.

45 This calls for an alternative. A patent applicant could be obliged to grant to interested third parties access to the AI's training data stored within the applicant's system, without being able to read the data in plain text, extract or copy it. The researchers, who receive access to the training data via the applicant's system, could be required to provide proper identifying information, including the identity documents and the proofs of the innovation purpose of the need in the data. Such systems for storage of the training data could base on various privacy-preserving machine learning (PPML) solutions that provide machine learning (ML) systems with privacy protection[121] and prevent data leakage in ML algorithms.[122] The recent achievements of PPML research integrate existing anonymization mechanisms into ML pipelines or design innovative new methods and architectures for preserving privacy in ML systems.[123] Further development of PPML techniques should take into account the need of data protection systems for the purpose of patent disclosure of the AI inventions. The depicted procedure for storage and usage of the AI training data[124] could balance the interests of the patent applicants with other researchers or interested third parties and satisfy the incentivizing purpose of the patent system.

II. Good Faith in Patent Disclosure

46 The requirements for disclosure of the invention are not prescribed in specific details, which allows flexibility in adaptation of patent disclosure to the nature of the invention and the needs of the technical field.[125] Thus, good faith in fulfilment of the obligations by the patent applicants and in performance of the duties by the patent examiners has a great significance in ensuring sufficient patent disclosure and the implementation of transparency in the patent system. The principle of good faith in disclosing patent information is tightly connected with transparency.

47 In particular, the following question may be considered in this context: shall the patentee bound by obligations of good faith reveal the best way of performing the respective invention at the time of a patent application?[126] The European legislation allows the patentee to provide the description which leads to a perfectly acceptable, but not necessarily optimal, version of the invention, even if the patentee knew this at the date of the application.[127] Article 29 of the Agreement on Trade-Related Aspects of Intellectual Property Rights (the TRIPS Agreement) indicates the best mode for carrying out the invention only as a non-mandatory condition.[128] At the same time, US patent law contains an obligatory best mode requirement. This requirement prescribes dis-

118 ibid.

119 Ebrahim (n 94) 215-17.

120 W Nicholson Price II and Arti K Rai, 'Clearing Opacity Through Machine Learning' (2021) 106 Iowa L Rev 775, 800, 802 <https://ilr.law.uiowa.edu/print/volume-106-issue-2/clearing-opacity-through-machine-learning> accessed 11 November 2022.

121 Runhua Xu, Nathalie Baracaldo, and James Joshi, 'Privacy-Preserving Machine Learning: Methods, Challenges and Directions' (*arXiv*, 2021) 26 <https://arxiv.org/pdf/2108.04417.pdf> accessed 22 November 2022.

122 Dulari Bhatt, 'Privacy-Preserving in Machine Learning (PPML)' (*Analytics Vidhya*, 2022) <www.analyticsvidhya.com/blog/2022/02/privacy-preserving-in-machine-learning-ppml/> accessed 22 November 2022.

123 Xu, Baracaldo, Joshi (n 121) 3.

124 Discussion with Professor Dr. iur. Alfred Früh, Faculty of Law, University of Basel (Basel, Switzerland, 10 November 2022).

125 Tim Roberts, 'Sufficiency of Disclosure (Enabling Disclosure, Disclosure of Prior Art, Best Mode)' (*WIPO*) 5 <www.wipo.int/export/sites/www/meetings/en/2006/scp_of_ge_06/presentations/scp_of_ge_06_roberts.pdf> accessed 11 November 2022.

126 Cornish and others (n 81) 249.

127 ibid 253.

128 Chakroun (n 46) 69.

closure in the patent specification of any instrumentalities or techniques that the inventor recognized as the best way of carrying out the invention according to the inventor's subjective perception and knowledge at the filing date.[129] However, the invalidity and cancellation means of enforcement of the best mode requirement have been removed from US patent legislation.[130]

48 There has been vast critique of the best mode requirement, with the reference to the following reasons: (1) the enablement requirement already compels a full and fair disclosure of an invention; (2) the inequitable conduct doctrine already imposes penalties on a patentee for intentional concealment of material information; (3) according to the best mode requirement inventor just has to disclose the best mode known to him at the time of the application without any duty to seek out the best mode; and (4) the best mode requirement does not provide for the information on the subsequent improvements after the time of filing.[131] Other critical arguments point out that (5) the best mode requirement is an obstacle to international harmonization in the patent system and that (6) the cost of this requirement exceeds its value.[132]

49 I would argue that the disclosure of the best mode of carrying out the invention corresponds to the good faith aspect of the transparency conception, as good faith anticipates performance at one's best (see above).[133] Furthermore, the disclosure of the best way of performing the respective invention (even if it is only from the inventor's point of view) fits the purpose of the patent system. The best mode requirement, if widely accepted and implemented, will extend the predictive capacity of a person having ordinary skill in an art and innovators will need to reach farther for the next patentable invention.[134] Thus, the best mode could contribute to establishment of the level of "inventiveness" necessary for an optimal patent system which effectively incentivizes further innovations.[135]

50 The best mode disclosure seems to be a necessity, which can ensure that the patentee holds their end of the quid pro quo bargain.[136] In turn, a patentee, that does not disclose the best mode contemplated by the inventor for carrying out the invention, could obtain the exclusive patent rights while keeping a part of valuable technical information regarding the invention in secret. This does not correspond to good faith in behaviour and to the purpose of the patent system.

51 Introducing the requirements on disclosing the best method known to the inventor for performing the invention should be further considered on the international level. The best mode requirement, if implemented in a reasonable manner, helps to ensure the adequacy of the disclosure of patent information and the quality of such information.[137] Disclosing the best mode of carrying out the invention ensures the proper establishment of the patent boundaries and promotes transparency in the patent system. Based on transparency, the patent system, which functions for material expression of immaterial goods, should be able to ensure the proper expression, which does not distort the initial source and the boundaries of the patented subject matters.

52 Other examples of incentivizing good faith in behaviour of patent applicants could be mentioned. Thus, some jurisdictions (in particular, Mexico, Spain and Uruguay) require the patent applicant to provide information on known prior art in connection to necessity to understand the invention or to examine the patent claims.[138] In the USA, this obligation is described with a direct reference to good faith: "Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability (...)".[139]

129 Adelman, Rader, Klancnik (n 44) 191, 211-12.

130 Chakroun (n 46) 89.

131 Adelman, Rader, Klancnik (n 44) 217, citing Advisory Commission on Patent Law Reform, *A Report to the Secretary of Commerce* (US 1992) 102-03.

132 Bingbin Lu, 'Best Mode Disclosure for Patent Applications: An International and Comparative Perspective' (2011) 16 J Intellec Prop Rights 409, 414.

133 para 20.

134 Lee Petherbridge and Jason Rantanen, 'In Memoriam Best Mode' (2012) 64 Stan L Rev Online 125, 129 <www.stanfordlawreview.org/wp-content/uploads/sites/3/2012/04/64-SLRO-125.pdf> accessed 24 November 2022.

135 ibid 129.

136 Alfred Früh, 'Transparency in the Patent System' in Rafał Sikorski, *Patents as an Incentive for Innovation* (Kluwer Law International 2021) 7.

137 Chakroun (n 46) 70.

138 World Intellectual Property Organization, 'WIPO Technical Study on Patent Disclosure Requirements Related to Genetic Resources and Traditional Knowledge' (UNEP/CBD/COP/7/INF/17 2004) 20 <www.wipo.int/edocs/pubdocs/en/tk/786/wipo_pub_786.pdf> accessed 28 November 2022.

139 ibid, citing 37 CFR, 1.56.

The problem to be solved is that patent examiners at the patent office do not always see and consider all of the relevant prior art.[140] For mitigation of this information asymmetry between the patentee and the patent office regarding the prior art, some authors propose to add the option of disclosing all relevant prior art in a special expanded prior art information disclosure statement that could be provided to the patent office by a patentee in exchange for a specific presumption of validity attached to the disclosed prior art (including the information on how the filed claims relate to the disclosed prior art).[141] If the patentee chooses this proposed option, a court will not invalidate the respective patent unless it is proved that no reasonable examiner would have allowed the patent in light of the disclosed prior art.[142] If the patentee does not choose the said option, the presumption of validity of the patent should be eliminated[143] and the patent office would retain the respective rights to invalidate the patent in the case of post-issuance litigation.[144]

53 In general, greater integration of the requirements on good faith in patent law will constitute an additional guarantee of achievement of the purpose of the patent system through transparency of patent information.

III. Legal Requirements to Transparency of Patent Information

1. Clearness, Completeness and Comprehensibility Requirements

54 After discussing the foundational issues regarding the patent scope in view of the purpose of the patent system and good faith aspect, it is necessary to consider the legal regulation in respect of patent disclosure as an essential element for assessing transparency of patent information. Let's consider the legal requirements of clearness, completeness, and comprehensibility of the disclosed patent information.

55 The disclosure requirement exists in the patent legislation of both the US system and the legislation of the member states of the Convention on the Grant of European Patents (European Patent Convention, EPC).

56 The European Patent Convention states as follows:

> The European patent application shall disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.[145]
>
> The claims shall define the matter for which protection is sought. They shall be clear and concise and be supported by the description.[146]

57 The mentioned Convention provides for the remedies to insufficient disclosure[147]:

> If the Examining Division is of the opinion that the European patent application or the invention to which it relates does not meet the requirements of this Convention, it shall refuse the application unless this Convention provides for a different legal consequence.[148]
>
> Opposition may only be filed on the grounds that: (...) the European patent does not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art;[149]
>
> a European patent may be revoked (...) on the grounds that: (...) the European patent does not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.[150]

58 The formal requirements regarding the form and substance of the patent claims are stipulated by Rule 43[151] of the Implementing Regulations to the Convention on the Grant of European Patents.[152]

140 'Peer-to-Patent Begins Expanded Pilot' (*PatentlyJobs*, 19 October 2010) <https://patentlyo.com/jobs/2010/10/peer-to-patent-begins-expanded-pilot.html> accessed 11 November 2022.

141 Jay P Kesan, 'Carrots and Sticks to Create a Better Patent System' (2002) Illinois Law and Economics Working Papers Series 3/2002, 145, 149, 151, 155-56 <https://ssrn.com/abstract=305999> accessed 11 November 2022.

142 ibid 156.

143 ibid 151.

144 Chakroun (n 46) 73.

145 Convention on the Grant of European Patents of 5 October 1973, as revised [2001] OJ EPO 4/55, art 83 (EPC).

146 ibid art 84.

147 Früh (n 136) 3.

148 EPC, art 97(2).

149 ibid art 100(b).

150 ibid art 138(1)(b).

151 Timmann, Haedicke (n 41) 356.

152 EPO, *Implementing Regulations to the Convention on the Grant of European Patents of 5 October 1973*, as amended (EPO 2022) <www.epo.org/law-practice/legal-texts/html/

The sufficiency of disclosure is also defined in the Guidelines for Examination in the European Patent Office.[153]

59 The provisions regarding patent disclosure are also stipulated by other international legal acts, such as the Patent Cooperation Treaty (PCT), the TRIPS Agreement, the Convention on the Unification of Certain Points of Substantive Law on Patents for Invention (Strasbourg Convention).[154] The disclosure requirements are included into the national legislation. For example, the patent acts of Switzerland, Germany and the United Kingdom contain similar provisions which envisage that the patent application shall disclose the invention in a manner sufficiently clear and complete for the invention to be performed by a person skilled in the art.[155] The requirements for disclosure in the USA and in Japan[156] are stricter than the requirements under the European Patent Convention.[157] Thus, the US patent legislation stipulates the following requirements to the specification:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.[158]

60 Further let's have a closer look on the rules and requirements around the patent disclosure, based on the European Patent Convention and the established practice.

61 The clearness and completeness requirements, which are envisaged in the legal provisions on patent disclosure, must ensure the ability to carry out the invention without undue experimentation by a person of ordinary skill in the art.[159] The skilled person may use the common general knowledge in the specific technical field to cure insufficiencies and errors in the disclosure in order to carry out

epc/2020/e/ma2.html> accessed 14 November 2022.

153 EPO, *Guidelines for Examination in the European Patent Office* (EPO 2022) pt F, ch III, para 1 <www.epo.org/law-practice/legal-texts/html/guidelines/e/f_iii_1.htm> accessed 14 November 2022.

154 The Patent Cooperation Treaty (PCT) sets up the following rules: "The description shall disclose the invention in a manner sufficiently clear and complete for the invention to be carried out by a person skilled in the art. (...) The claim or claims shall define the matter for which protection is sought. Claims shall be clear and concise. They shall be fully supported by the description" (arts 5, 6). Article 29 of the TRIPS Agreement envisages: "Members shall require that an applicant for a patent shall disclose the invention in a manner sufficiently clear and complete for the invention to be carried out by a person skilled in the art and may require the applicant to indicate the best mode for carrying out the invention known to the inventor at the filing date or, where priority is claimed, at the priority date of the application". The Convention on the Unification of Certain Points of Substantive Law on Patents for Invention (Strasbourg Convention) contains the following statements: "1. The patent application shall contain a description of the invention with the necessary drawings referred to therein and one or more claims defining the protection applied for. 2. The description must disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. 3. The extent of the protection conferred by the patent shall be determined by the terms of the claims. Nevertheless, the description and drawings shall be used to interpret the claims" (art 8).

155 In the United Kingdom, the Patents Act 1977 establishes: "The specification of an application shall disclose the invention in a manner which is clear enough and complete enough for the invention to be performed by a person skilled in the art" (s 14). Pursuant to the Swiss Federal Act on Patents for Inventions of 25 June 1954, "The invention must be described in the patent application in such a manner that it can be carried out by a person skilled in the art" (art 50, para 1). The German Patent Act (Patentgesetz, as published on 16 December 1980, as amended) contains the similar provision: "The application shall disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art" (s 34).

156 Article 36 of the Japanese Patent Act No. 121 of 13 April 1959 contains rather broad requirements: "(...) The statement of the detailed explanation of the invention (...) must comply with each of the following items: (i) as provided by Order of the Ministry of Economy, Trade and Industry, it is clear and sufficient to enable a person ordinarily skilled in the art of the invention to work the invention; (...) The statement of the claims (...) must comply with each of the following items: (i) the invention for which the patent is sought is stated in the detailed explanation of the invention; (ii) the invention for which a patent is sought is clear; (iii) the statement for each claim is concise; and (iv) the statement is composed in accordance with Order of the Ministry of Economy, Trade and Industry", 'Patent Act' (*Japanese Law Translation*) <www.japaneselawtranslation.go.jp/en/laws/view/4097#je_ch2at13>) accessed 12 November 2022.

157 Laurence Lai and others, *Visser's Annotated European Patent Convention* (2021 edn, Wolters Kluwer 2021) 183.

158 United States Code (July 19, 1952, ch 950, 66 Stat 798; Pub L 89-83, §9, July 24, 1965, 79 Stat 261; Pub L 94-131, §7, Nov 14, 1975, 89 Stat 691; Pub L 112-29, §4(c), Sept 16, 2011, 125 Stat 296) title 35, pt II, ch 11, s 112.

159 Timmann, Haedicke (n 41) 219-20, 222-23, 232.

the invention,[160] however without an undue effort[161] and without using the documents not belonging to the common general knowledge and not referred to in the application as filed.[162]

62 As the legal provisions do not explicitly define the point(s) in time when it shall be possible for the skilled person to carry out the invention, there are continuous debates on this issue: whether it means the filing/priority date, application date, date of disclosure, date of grant or even a later point in time.[163] The legal view, according to which the disclosure of the patent application and the patent must be measured in terms of realisability at the filing/priority date,[164] seems to be well-grounded, as orientation on other point in time may cause strange situations from the resulting break in the uniform notion of disclosure.[165]

63 The sufficiency of patent disclosure depends on the claims, which define the matter for which protection is sought.[166] The clarity requirement shall ensure that a claim defines the protected subject-matter in such an accurate way that a person skilled in the art is able without any unreasonable effort, safely and clearly define what the protected subject-matter is and whether a certain embodiment falls under the claim or not.[167] The subject-matter protected by patent must be described as precisely as possible, which means that the claim's respective category shall be indicated clearly, the claim shall not contain any contradictions in terms or regarding the description, the meaning of the terms shall be clear at least from the context, and the claims shall be technically comprehensible in themselves.[168] At the same time, neither the complexity of a claim means lack of clarity, nor its simplicity is a self-contained requirement for the granting of a patent.[169]

64 The invention is disclosed sufficiently and completely, if the skilled person is able to obtain substantially all embodiments falling within the scope of the claims.[170] Sufficiency of disclosure requires that a broad claim includes in general the disclosure of a number of alternatives over the range of the claim, however, the only disclosed embodiment may be sufficient if it has the technical advantages of the invention as stated in the application and the skilled person is able to perform the invention over the whole claimed range.[171] When assessing sufficiency of disclosure, a feature of an embodiment must receive an interpretation that is meaningful for the function of the said feature to be performed, whether other interpretations shall be excluded by the skilled person as being irrelevant for working the invention.[172] In general, the claim may be considered as insufficiently disclosed, if a technical effect expressed in the claim is not achieved.[173]

65 The claims must be supported by the description[174], which typically outlines the technical field of the invention, elaborates on the background art of the invention and sets out the detailed features of the invention.[175] The description shall contain a basis for

160 Laurence Lai and others (n 157) 182, citing T 206/83 *Herbicides* [1987] OJ EPO 5, para 5.

161 Laurence Lai and others (n 157) 182, citing T 171/84 *Redox Catalyst* [1988] OJ EPO 95, para 12.

162 Laurence Lai and others (n 157) 182, citing T 580/88 (Decision of Boards of Appeal of EPO, 25 January 1990), para 2.3.

163 Timmann, Haedicke (n 41) 223-25.

164 ibid 224-25.

165 ibid 225-26.

166 EPO, *Guidelines for Examination in the European Patent Office* (EPO 2022) pt F, ch IV, para 4.1 <www.epo.org/law-practice/legal-texts/html/guidelines/e/f_iv_4_1.htm> accessed 14 November 2022.

167 Timmann, Haedicke (n 41) 356, 358.

168 ibid 357.

169 T 1020/98 *Safeners/BAYER* [2003] OJ EPO 533, hn I, para 3.5.2.

170 Laurence Lai and others (n 157) 194, citing T 226/85 *Stable Bleaches* [1988] OJ EPO 336.

171 Laurence Lai and others (n 157) 183, 194, citing EPO, *Guidelines for Examination in the European Patent Office* (EPO 2022) pt F, ch III, para 1 <www.epo.org/law-practice/legal-texts/html/guidelines/e/f_iii_1.htm> accessed 14 November 2022; EPO, *Guidelines for Examination in the European Patent Office* (EPO 2022) pt F, ch IV, para 6.3 <https://www.epo.org/law-practice/legal-texts/html/guidelines/e/f_iv_6_3.htm> accessed 14 November 2022; T 435/91 *Detergents* [1995] OJ EPO 188, para 2.2.3; T 1173/00 *Transformer with High-Temperature Superconductor for Locomotives* [2004] OJ EPO 16, para 3.1; T 409/91 *Fuel Oils* [1994] OJ EPO 653, hn, para 3; T 0595/90 *Grain Oriented Silicon Sheet* [1994] OJ EPO 695, hn II.

172 Laurence Lai and others (n 157) 182, citing T 0521/12 *Graphical Interface for Information Retrieval and Simulation/BOEING* (Decision of Boards of Appeal of EPO, 2 June 2016) para 9.

173 Laurence Lai and others (n 157) 185.

174 Cornish and others (n 81) 253.

175 WIPO, 'Dissemination of Patent Information' (n 47) 12.

the subject-matter of every claim.[176] The claims must not be broader than is justified by the extent of the description and drawings and also the contribution to the art.[177] Drawings are not always necessary for sufficient and complete disclosure of the claimed invention, but they are useful to illustrate, for example, a map of the invented object, an electronic circuit or a chemical formula.[178] An abstract, which also forms a part of a patent application, provides a concise summary of the disclosure for understanding of the general gist of the invention and is not taken into account for the purpose of interpreting the claims or determining the sufficiency of the disclosure.[179]

66 As it may be seen from the above-mentioned, both national laws and international multilateral treaties establish a set of requirements to patent disclosure. The clearness and completeness requirements to patent disclosure are directly established by the legal norms. The legal provisions regarding the sufficient scope for the implementation of the invention by a person skilled in the art can be considered as the requirement of comprehensibility. Thus, when assessing transparency of patent information, correspondence with the requirements of clearness, completeness and comprehensibility of such information should be considered.

2. Availability and Accessibility Requirements

67 According to the conception proposed in this paper, availability and accessibility of information, if enshrined in law, are among the requirements for its transparency. Patent offices, which maintain the patent registers with valuable patent information, play a crucial rule in satisfaction of these requirements within the patent system. The primary role of the patent offices is to ensure that reliable information is available in a timely manner in a usable format.[180] The availability of information, which may be found and accessed in the patent registries, supports transparency within the technology-based market and transactions in the sphere of intellectual property.[181]

68 Article 12 of the Paris Convention for the Protection of Industrial Property states that each country of the Paris Union undertakes to establish a special industrial property service and a central office for the communication to the public of patents, utility models, industrial designs, and trademarks.[182] This service shall publish an official periodical journal and shall publish regularly the names of the proprietors of patents granted, with a brief designation of the inventions patented.[183]

69 The European Patent Convention includes the following regulation concerning the European Patent Register:

> The European Patent Office shall keep a European Patent Register, in which the particulars specified in the Implementing Regulations shall be recorded. No entry shall be made in the European Patent Register before the publication of the European patent application. The European Patent Register shall be open to public inspection.[184]

70 The Implementing Regulations to the Convention on the Grant of European Patents establish data, which the European Patent Register shall contain.[185] The peculiarities of maintaining local patent registers are established on the national level in the national legal regulation and practice. In providing patent information, the patent offices follow patent information dissemination policies which differ from country to country.[186] Many national offices officially publish the bibliographic data, including name(s) and address(es) of inventor(s) and applicant(s), date and number of application(s), date and number of publication, patent classification, the title of the invention and the full text of the claims, description and abstract.[187] However, in some countries, only limited information, such as the date of the grants,

176 EPO, *Guidelines for Examination in the European Patent Office* (EPO 2022) pt F, ch IV, para 6.1 <www.epo.org/law-practice/legal-texts/html/guidelines/e/f_iv_6_1.htm> accessed 14 November 2022. See also T 409/91 *Fuel oils* [1994] OJ EPO 653, para 3.3.

177 ibid.

178 WIPO, 'Dissemination of Patent Information' (n 47) 12.

179 ibid.

180 ibid 17.

181 ibid 2, 9.

182 Paris Convention for the Protection of Industrial Property, as amended on 28 September 1979.

183 ibid art 12(2).

184 Convention on the Grant of European Patents of 5 October 1973, as revised [2001] OJ EPO 4/55, art 127.

185 EPO, *Implementing Regulations to the Convention on the Grant of European Patents of 5 October 1973*, as amended (EPO 2022) pt VII, ch IX, r 143 <www.epo.org/law-practice/legal-texts/html/epc/2020/e/ma2.html> accessed 14 November 2022.

186 WIPO, 'Dissemination of Patent Information' (n 47) 16.

187 ibid 13.

the date of filing, the names of the applicants and the title of the inventions, is published in the official publication, whereas other information, such as the full text of the claims and the description is laid open for public inspection in the patent offices.[188]

71 Difficulties in access to patent information are listed among the main problems of the patent system.[189] Authors often note that the existing public patent registers are not as helpful as they could and should be.[190] In particular, storage of patent collections only in paper form[191] instead of their availability in electronic format creates obstacles to accessibility of patent information. It can be difficult to access the information on the technical contents of patents and the status of such patents (and patent applications), particularly from abroad.[192]

72 Taking into consideration not only the letter, but also the spirit of the respective legal regulation, it can be concluded that availability and accessibility of patent information are prescribed by patent law. Hence, the respective requirements of availability and accessibility should be considered for assessing transparency of patent information in the patent registers. In turn, the necessity of alignment with the purpose of the patent system determines that the patent information stored in the patent registers should be sufficient for its usage for further innovative activity.

3. Means to Improve the Quality and Availability of Patent Information

73 One of the problems of the patent system is that the interested readers of the patent documents are often not able to obtain truly useful information from them[193] and to exploit this information for further development of innovations.[194] In practice, there are frequent cases of the abuse of the patent monopoly, when patents are granted in exchange for incomplete disclosure.[195] There are surveys, according to which the patent system and patent disclosure make hardly any positive contribution to innovation and very few innovative companies attach any value to the patent system as a source of technical information.[196] Thus, the ways of general improvement of the respective rules and practice with the aim of strengthening the quality and availability of patent information need to be considered.

74 On the whole, establishing stronger limits against vague or overly abstract claims, including the patents in software and other technologies, should be proposed.[197] The strong limits should cover the patent applications with the broadest scopes aiming at making it difficult to invent around, as well as the abuse of rights in the form of "continuing" applications, keeping claims hidden[198], and the so-called "submarine patents" (very large applications making the actual invention virtually invisible and almost unsearchable).[199]

75 There are various suggestions for incentivizing the patentees to disclose clearer and more practical patent information: (1) sending patent applications for additional "peer review", which is something similar to the procedure of getting a paper published in a scientific journal[200]; (2) involvement of experts in the relevant fields for technical comments to some parts of patent application (if such comments are required by the patent office)[201]; (3) envisaging an obligation of a patentee to respond to the good-faith questions regarding the reproducibility of the invention asked by an ordinary person (similar to the questions that could be stated to the author of the published scientific paper).[202]

76 Separate attention should be paid to the patent claim language, which should not be vague. According to the relevant European case law, "a claim cannot be

188 ibid.

189 Chakroun (n 46) 23.

190 David Vaver, 'Sprucing Up Patent Law' (2011) 23 Intellectual Property Journal 63, 70.

191 World Intellectual Property Organization, Standing Committee on the Law of Patents, 'Technical Solutions to Improve Access to, and Dissemination of, Patent Information' (SCP/14/3 2009) 12 <www.wipo.int/edocs/mdocs/scp/en/scp_14/scp_14_3.pdf> accessed 11 November 2022.

192 WIPO, 'Dissemination of Patent Information' (n 47) 3.

193 Fromer (n 45) 543.

194 Chakroun (n 46) 5.

195 Machlup (75) 32.

196 Chakroun (n 46) 22, 24.

197 James Bessen and Michael James Meurer, *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators at Risk* (Princeton University Press 2008) 26.

198 ibid 62.

199 Guellec, Van Pottelsberghe de la Potterie (n 39) 88.

200 Chakroun (n 46) 78.

201 ibid.

202 ibid 79.

considered clear [...] if it comprises an unclear technical feature [...] for which no unequivocal generally accepted meaning exists in the relevant art".[203] For achieving some progress on clarity of the patent claim language, the patent offices could establish glossaries of commonly used terms of claims, or specify references as authoritative sources of definitions[204] or establish a code of best practices.[205] Such a code should include definitions of the key concepts connected to patent information and explanations on the terminology for each section of the patent application.[206] AI-enabled drafting assistance software[207] could also be very helpful for clarity of patent language and for sufficiency of patent disclosure.

77 The use of blockchain, AI and other modern technologies within the patent prosecution process could contribute to transparency of the respective patent information. The researchers expect the wide use of the digitalized representation of inventions in future.[208] There are also futuristic suggestions that sufficiency of patent disclosure may be tested by or with the help of the AI tools, being fed with the patent description for further performing the claimed invention.[209] When some of the patent prosecution tests could be efficiently conducted by machines, the inventors (applicants) will be able to check the sufficiency of the claimed inventions on the stage of patent drafting and to respectively correct the draft.[210]

78 Patent offices possess the examination tools which can induce transparency in patent disclosure. There is a need of adequate disclosure review within the patent examination procedure by the examiners of the patent offices.[211] Patent attorneys, when drafting patent applications, first of all, aim at securing maximum protection and interests of their clients.[212] On one hand, full information needs to be disclosed, as the scope of disclosure defines the scope of patent protection. On the other hand, keeping some information secret or even adding misleading details may help to erect barriers for easy copying of the invention by the competitors.[213] So it is the task of the patent office to ensure transparency of the disclosed patent information according to the public interests. That is why, "[i]t is highly desirable that the principles governing disclosure should be uniform for all Patent Offices".[214] That is why it is so important to talk about transparency as a value in patent law. The special trainings for the experts of the patent offices should include values alignment and should effectively serve to improvement of the respective examination practice according to good faith. The means for incentivizing the good faith approach of the patent applicants have already been outlined in this paper (see above).[215]

79 The good governance approach of patent offices plays a prominent role also in implementation of availability and accessibility of information. For instance, the Swiss Federal Institute of Intellectual Property (IPI) on the official web-site, mentions transparency as a hallmark for its practice[216] and provides for the useful list of free online databases, where one can search for patent information as a source of inspiration (e.g., Swissreg, Espacenet, PATENTSCOPE, Patent Lens, DEPATISnet, USPTO, UK IPO, JPO database, CNIPA database, KIPO Datenbank, International Patent Classification, Cooperative Patent Classification, etc.).[217] This is a good collection of the respective sources, supported by short explanations for an average user. The Ukrainian special information system also currently provides the claims, descriptions, drawings and abstracts to the inventions online.[218]

80 Digitization of national patent collections and patent information is very much needed, as it makes possible to search and process raw data from millions of patent documents.[219] It may be suggested to establish international legal regulation, obliging

203 T 728/98 *Pure terfenadine/ALBANY* [2001] OJ EPO 319.

204 Bessen, Meurer (n 197) 239.

205 Chakroun (n 46) 82.

206 ibid 212-13.

207 Lee, Hilty, Liu (n 92) 135.

208 ibid 122.

209 Hervey, Lavy (n 99) 293.

210 Lee, Hilty, Liu (n 92) 133.

211 Fromer (n 45) 591.

212 Chakroun (n 46) 145.

213 ibid 145, 157.

214 Roberts (n 125) 5.

215 paras 49-53.

216 'The History of the IPI' (*IGE/IPI*) <www.ige.ch/en/about-us/the-history-of-the-ipi> accessed 17 November 2022.

217 'Searching for Patents Yourself' (*IGE/IPI*) <www.ige.ch/en/services/searches/patent-searches-in-general/searching-for-patents-yourself> accessed 13 November 2022.

218 See 'UANIPIO Special Information System' (*SIS*) <https://sis.ukrpatent.org/en/search/simple/> accessed 2 November 2022.

219 WIPO, 'Dissemination of Patent Information' (n 47) 7, 17.

the states to ensure online availability of the claims, descriptions, drawings and abstracts in the national patent registers.

81 There are also proposals on improvement of patent information classification (for example, classification of patent information on the basis of patent families), as well as on improvement of indexing of patent information (in particular, locating the index within the general technical databases).[220] The global application of common classification for basic legal events and setting up a minimum set of legal status data may be substantial to secure transparency of patent information.[221]

82 AI, if applied by the patent offices, could become a very helpful tool for restoring the readability of the patent registers and for transformation of the respective storages into full human inventiveness repositories.[222] There is also a need in a cross-language tool that could, with the aid of specialized dictionaries, provide the translation of patent information into different languages, as well as provide synonyms, for any keyword which has been input as a criterion for search.[223] Establishing electronic links between the patent registers and the court systems containing information on the court judgements, by which the respective administrative decisions of the patent offices are reviewed, is also desirable. Therefore, the patent information databases should be synchronized with the modern information and data processing technologies, which would increase transparency of the respective technical information.[224]

83 There are also suggestions regarding increase of availability and accessibility of contextual information (see above)[225] about the patents for promoting the technological progress—in many cases, using already existing information.[226] In particular, the accurate and up-to-date information about applicants and owners—which is recorded in the national patent registry and is available to the public—increases transparency regarding the actual ownership of patents, makes it easier to contact right holders[227] and can be helpful for technical learning from the patent.[228] However, this information is not always properly available. In fact, it is sometimes impossible to know with certainty who owns a patent.[229] This gap in patent ownership information[230] should be addressed, perhaps by introducing the respective legal requirement. Availability of, and accessibility to, the court decisions, by which the respective administrative decisions of the patent offices are reviewed, may also increase transparency and legal certainty.[231] Knowing if a patent has been previously litigated clearly has significance for the dissemination of the invention.[232] However, this information is often not properly reported.[233] Further use of modern technologies may be suggested for establishing links between the patent registers and the court systems containing information on the patent cases.

E. Conclusion and Outlook

84 Transparency constitutes a legal value, which ensures the quality of information, and may also be considered as a virtue, as a qualitative characteristic of the respective data. Transparency creates the legal environment suitable for realization of other values and purposes of the legal systems. This suitable legal environment is created by transparency, in particular, with reduction of the information asymmetries in legal relations.

85 The conception of transparency, proposed in this paper, allows one to access the content of transparency, as well as to gauge the implementation of transparency in practical cases through the following elements: (1) alignment with the purpose (assessment whether information has been impacted by the respective subjects in a way that precludes achievement of the purpose of the legal system/area); (2) good faith in fulfilment of obligations concerning information; and (3) correspondence to the legal re-

220 Fromer (n 45) 585-86; Chakroun (n 46) 124, 126-27.

221 Chakroun (n 46) 134.

222 Früh (n 136) 14.

223 WIPO, 'Dissemination of Patent Information' (n 47) 21.

224 Mindaugas Kiskis, 'Transparency for Efficiency of the International Patent System' (2014) 3(2) NTUT J of Intell Prop L and Mgmt 118, 132 <https://iip.ntut.edu.tw/var/file/92/1092/img/2036/NTUTJournal-2014-v3i2-2-Kiskis.pdf> accessed 11 November 2022.

225 para 29.

226 Chien (n 57) 1890.

227 WIPO, 'Dissemination of Patent Information' (n 47) 3, 15.

228 Chien (n 57) 1880.

229 ibid.

230 ibid.

231 WIPO, 'Dissemination of Patent Information' (n 47) 3.

232 Chien (n 57) 1881.

233 ibid.

quirements regarding transparency, which imply clearness, completeness and comprehensibility of information, as well as availability and accessibility of information.

86 The theoretical consideration of transparency as a legal value in patent law sheds new light on disputed issues of patent disclosure, such as the sufficiency of patent disclosure, the best mode requirement and the disclosure of training data when patenting AI inventions. According to the vision of transparency proposed in this paper, the scope of patent disclosure shall be determined by the purpose of the patent system, which is stimulating further innovations (and not the mere disclosure of technical information). Consequently, patent disclosure should be sufficient to be used by the inventors for further technological development. In view of this, consideration of a special system for depositing the AI's training data is suggested. Thus, a patent applicant could be obliged to grant to interested third parties access to the AI's training data stored within the applicant's system based on the PPML solutions, without being able to read the data in plain text, extract or copy it. Patent law envisages a set of requirements to the sufficiency of patent disclosure, which includes the requirements of clearness, completeness and comprehensibility, as well as the requirements of availability and accessibility of information. However, taking into consideration the general character of the legal provisions concerning patent disclosure, good faith in fulfilment of the respective obligations regarding information plays a crucial role for proper implementation of these provisions in line with transparency. Good faith anticipates, inter alia, that the respective subjects must fulfil the obligations at their best. This builds foundations for justification of the best mode requirement to disclosure of carrying out the invention, as this scope of disclosure corresponds to the good faith aspect of the transparency conception and fits the purpose of the patent system.

87 Transparency does not automatically require greater amount of information (unless there are legislative provisions), it puts forward the qualitative characteristics of information, depending on the respective legal environment. Therefore, increasing the quantity of the disclosed patent information does not automatically imply transparency of that information, as it does not mean that this information can be effectively used for further innovative activity. At the same time, patent disclosure should be minimum sufficient for the achievement of the purpose of incentivizing innovations, but there is no need in disclosure of "too much" of information. From this point of view, for example, introduction of the economic enablement requirement can't be justified, as such requirement anticipates the scope of disclosure which exceeds the extent thatis sufficient for achievement of the purpose of the patent system.

88 This paper contains various suggestions for improvement of the quality and availability of patent information with the aim of implementing transparency within the patent system. It may be concluded that transparency should be an essential element of all the legal relations in connection to information. Consolidation of the legal provisions on transparency and scientific attention to this legal value will promote its implementation and transformation into the well-established principle of law.