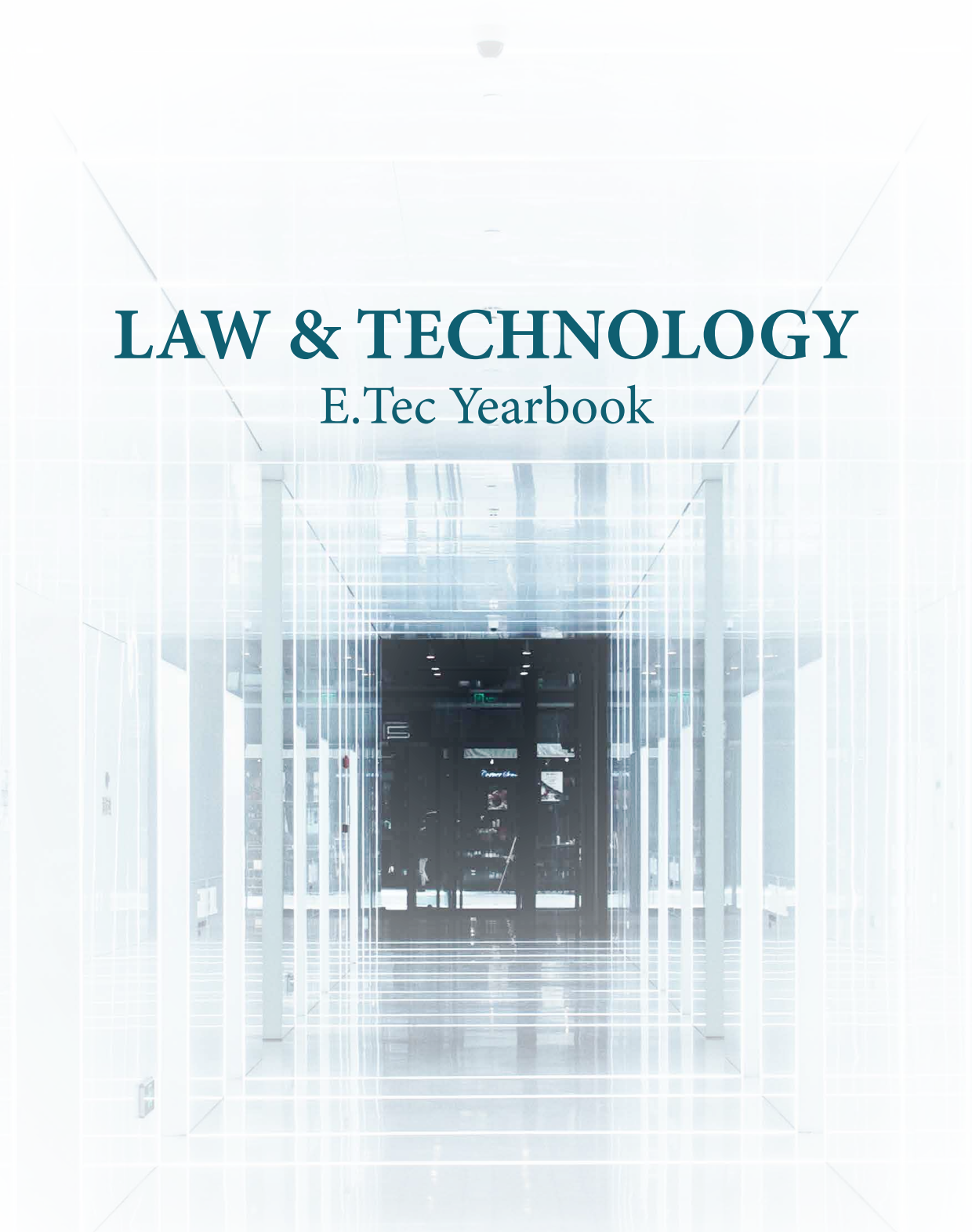
LAW & TECHNOLOGY

E.Tec Yearbook



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PREFACE

E.Tec - State, Enterprise and Technology is one of the Research Centre for Justice and Governance (JusGov) groups. It conducts multidisciplinary research on the interplay between State, enterprise and technology, aiming to develop scholarship and policy inputs that may contribute to the creation of economic and social value which is fairer, more effective, and sustainable.

The group's activity plan includes the publication of a Yearbook, in open access, which aims to disseminate the results of part of the scientific research being developed by the participating researchers with relevant external collaboration and to foster the evolution of the legal thinking.

This inaugural volume is dedicated to an area of current relevance with undisputable economic, social and legal importance: Law and Technology. The texts now published have in common the exploitation of legal problems arising from technological innovations - in particular digital transformation, artificial intelligence and robotics - by discussing and presenting solutions for the challenges posed in different areas of law, explored in E.Tec research strands: industry 4.0, artificial intelligence and robotics, Health Law and Governance.

An acknowledgment is due to all the participants in this first Yearbook, as well as to the University of Minho Law School (EDUM) for supporting this project.

Maria Miguel Carvalho
Principal researcher of E.Tec

THE ELIMINATION OF THE SUSCEPTIBILITY OF GRAPHIC REPRESENTATION AND TRADE MARK REGISTRATION[1]

Maria Miguel Carvalho[2]

Abstract: Directive (EU) 2015/2436 of the European Parliament and of the Council of 16 December 2015 has eliminated the requirement for the susceptibility of graphic representation in the registration of trade marks, and foresees that, for a sign to be registered as a trade mark, it must be capable of distinguishing the goods or services of one undertaking from those of other undertakings and being represented on register *in a manner which enables the competent authorities and the public to determine the clear and precise subject matter of the protection afforded to its proprietor.*

Since this requirement has been repealed and the preparatory work for the new Portuguese Industrial Property Code is underway, we propose to briefly reflect

[1] The text published here served as a basis for our intervention in the panel entitled «Intellectual Property» at the 5th International Congress «Law in Lusophony», on 23 March 2018, at the School of Law of the University of Minho, under the theme «Law and New Technologies» and is updated until 26 April 2018.

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on the meaning and scope of the amendment introduced by the new Trade Mark Directive.

Keywords: Trade Mark Law Reform – trade mark representation – new technologies

Summary: Introduction 1. The legislative amendment determined by the Trade Mark Directive (recast) 2. The scope of the legal amendment for non-traditional trade marks 2.1. New technologies and the Internet of Things 2.2. The meaning of the reference to the «Sieckmann» criteria in the Trade Mark Directive 3. Final remarks

Introduction

The legal concept of trade mark, foreseen in the Portuguese Industrial Property Code [*CPI, Código da Propriedade Industrial*][3], and which is still in force, is based on the sign's ability to distinguish products or services. However, influenced by the Trade Mark Directive[4], the current article 222 of the CPI, in addition to including an exemplary list of signs that may constitute trade marks, establishes another requirement for registration: the susceptibility of the sign's graphic representation.

The latter requirement – which is found in several legal orders and is justified on technical grounds (since the graphic representation would facilitate the assessment of the application for trade mark registration by the competent authority and its publication) and legal certainty (in so far as it would be necessary to determine, more precisely, the subject matter of the protection afforded to the trade mark) – , has been criticised by the doctrine, essentially for considering that a requirement «of an objective, formal and functional nature»[5] should not incorporate the definition of a trade mark[6], and because it was established at a time when there were no technological means enabling the disclosure of registered signs that were «different», «new» or «non-traditional» – such as tactile,

[3] Approved by DL No 36/2003, of 5 March.

[4] First Council Directive of 21/12/1988 to approximate the laws of the Member States relating to trade marks, No 89/104/EC, codified by Directive 2008/95/EC of 22/10/2008 (*OJ L* 299 of 8/11/2008, 25 ff.)

[5] Marco Arcalá, «Prohibiciones absolutas», in: *Comentarios a la Ley de Marcas* (Rodríguez Cano/García-Cruces González), Cizur Menor (Navarra), Editorial Aranzadi, 2003, 138 ff.

[6] Cf., among others, Otero Lastres, José Manuel, «La definición legal de marca en la nueva Ley Española de Marcas», in: *Actas de Derecho Industrial,* Tomo XXII, 2001, 200 ff.

gustatory and olfactory signs, among others –, would, in practice, make it impossible to register them[7].

The Court of Justice of the European Union [CJEU], which was asked to interpret the meaning of the susceptibility of graphic representation in the Trade Mark Directive, stated that this does not mean that a sign must be, in itself, capable of being perceived visually; what it must be is capable of being represented graphically, namely through images, lines or characters, which fulfil the so-called "Sieckmann criteria"[8], i.e., the graphic representation must be clear, precise, self-contained, easily accessible, intelligible, durable and objective.

If the requirement for susceptibility of graphic representation may raise difficulties and, in fact, make it impossible to register the so-called «new» trade

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[7] We have already had the opportunity to research this subject in another study: Carvalho, Maria Miguel «"Novas" marcas e marcas não tradicionais: objecto», in: *Direito Industrial* (coord. José de Oliveira Ascensão), Vol. VI, Coimbra, APDI/Almedina, 2009, 217-145 ff. On the same subject, cf., among us, Silva, Pedro Sousa and, «Sinal e marca: as marcas não tradicionais», in: *Direito Industrial* (coord. José de Oliveira Ascensão), Vol. VIII, Coimbra, APDI/Almedina, 2012, 363-381 ff. and also, among others, LaLonde, Anne Gilson/Gilson, Jerome, «Getting real with non-traditional trademarks: what's next after red oven knobs, the sound of burning methamphetamine, and goats in a grass roof?», in: *The Trademark Reporter*, 101, no.1, January/February, 2011, 186-218 ff. (available for consultation at https://www.brinksgilson.com/files/gilsontmrnon-traditional_trademarks_2011.pdf, visited, for the last time, on 26 April 2018).

Critically, on the need to protect these non-traditional signs, cf. Port, Kenneth L., «On Nontraditional Trademarks», Faculty Scholarship, Paper 235, 2011, available for consultation at http://open.mitchellhamline.edu/facsch/235 (visited, for the last time, on 26 April 2018). This work was also published in *Northern Kentucky Law Review*, 381, 2012, 1-59 ff.

[8] The usual description of these criteria is due to the fact that they were first established in paragraphs 45 and 55 of the Judgment of 12/12/2002, given in Case C-273/00, «Sieckmann» case, ECLI:EU:C:2002:748.

In this case, were discussed preliminary questions concerning article 2 of the Trade Mark Directive submitted by the *Bundespatentgericht*, following the appeal by Ralf Sieckmann against the decision of the *Deutsches Patent-und-Markenamt* [DPMA] refusing to register an olfactory sign as a trade mark - the pure chemical substance methyl cinnamate (cinnamic acid methyl ester) - for various services in classes 35, 41 and 42. The DPMA's refusal to register was based on the lack of graphic representation and the lack of distinctive capacity (§§ 3 Abs.1, 8 Abs. 1 and 2 of *Gesetz über den Schutz von Marken und sonstigen Kennzeichen [MarkenG])*.

Regarding the first plea referred, it must be understood that that olfactory sign was represented by the corresponding chemical formula (C6H5-CH = CHCOOCH3) and, with the application for registration, Ralf Sieckmann also provided a container with a sample of the sign's scent, adding that it is commonly described as «a balsamically fruity scent with a slight hint of cinnamon» (v. paragraphs 11 and 13 of the Judgment *cit*.).

The CJEU decided in the sense referred to in the text and this understanding was reiterated in subsequent judgments of the same Court.

All the CJEU Judgments referred to in this work are available for consultation at: https://curia.europa.eu/jcms/jcms/j_6/pt/.

On the judgment in the «Sieckmann» case, cf., among us, Gonçalves, Luís M. Couto, «Marca olfactiva e o requisito da susceptibilidade de representação gráfica – Court Judgment, of 12.12.2002, Case C-273/00», in: *Cadernos de Direito Privado*, no. 1, January/March 2003, p. 26.

marks or non-traditional trade marks, which many have been trying to exploit commercially[9], the truth is that the technological advances that emerge daily, and which allow new forms of representation, not exactly graphic, but which may not jeopardize legal certainty, are undeniable. Therefore, it is not surprising that one of the major changes resulting from the adoption of the new Trade Mark Directive – Directive (EU) 2015/2436 of the European Parliament and of the Council of 16 December 2015 [TMD][10] – was the elimination of the requirement of susceptibility of *graphic* representation of the sign, in order to access the registration of trade marks.

1. The legislative amendment determined by the Trade Mark Directive (recast)

With the entry into force of article 3 of the TMD, on 15th January 2019[11], in order for a sign to be registered as a trade mark, in any Member State[12], it must be capable of distinguishing the goods or services of one undertaking from those of other undertakings (paragraph a) but, in order to «ensure legal certainty and sound administration, it is also essential to require that the sign is capable of being represented in a manner which is clear, precise, self-contained, easily accessible, intelligible, durable and objective», allowing the representation of the sign «in any appropriate form using generally available technology, and thus not

[9] As we have already had the opportunity to mention in other studies, since Man is a multisensory animal and since everything that is perceptible by the senses and not only by one of the senses (vision), may constitute indicators for the consumer, the attempt of commercial exploitation of these other signs is understandable. For further developments, Carvalho, Maria Miguel, «"Novas" marcas…», *cit.*, p. 219. On the attempt to take advantage of the colour mark,, cf. Carvalho, Maria Miguel, «A possibilidade de registo como marca da cor *per se*», in: *Estudos em comemoração dos 20 anos da Escola de Direito da Universidade do Minho* (org. Mário Ferreira Monte/Joaquim Freitas da Rocha/Joana Aguiar e Silva/Elizabeth Fernandez), Coimbra, Coimbra Editora, 2014, 469-487 ff. and «A proteção jurídica da cor única como marca no âmbito da indústria da moda – breves notas a propósito dos casos da «sola lacada a cor vermelha», in: *Actas de Derecho Industrial y Derecho de Autor* (Espanha), vol. XXXIV, 2013-2014, 137-152 ff.

[10] OJ L 336, de 23/12/2015, 1 ff.
The TMD establishes the repeal of Directive 2008/95/EC, of 22/10/2008, as of 15 January 2019 (article 55). On this, cf. Carvalho, Maria Miguel, «A nova diretiva europeia sobre marcas e a sua transposição para a ordem jurídica portuguesa», in: *Revista de Direito Intelectual*, no. 02-2017, 89-122 ff.
On the preparatory work for this Directive, cf. Carvalho, Maria Miguel, «O estudo sobre o funcionamento geral do sistema europeu de marcas», in: Actas de Derecho Industrial y Derecho de Autor (Espanha), Tomo XXXI, 2010-2011, 509-526 ff., esp. 521 f.

[11] V. article 56 TMD.

[12] In the case of the EU trade mark, v. article 4 of Regulation (EU) 2017/1001 of the European Parliament and of the Council of 14/06/2017 on the European Union trade mark [EUTMR], *OJ L* 154, of 16 June 2017, 1 ff.

necessarily by graphic means, as long as the representation offers satisfactory guarantees to that effect» (v. Recital 13 of the TMD).

For these reasons, being removed the requirement for the susceptibility of graphic representation of the sign, it is now required that it must be capable of being represented on the register *in a manner which enables the competent authorities and the public to determine the clear and precise subject-matter of the protection afforded to its proprietor* (paragraph b).

Although we continue to consider that it would have been better to separate the regulation of the requirements concerning the representation of the sign from the concept of trade mark, we agree with the meaning of the amendment introduced by the new TMD in regard to the susceptibility of representation, since it seems to us that if a sign has distinctive capacity (and there are no other grounds for refusing its registration as a trade mark), it must be able to access the register if it can be *appropriately represented*. This appropriate form does not mean that the representation has necessarily to be done through graphic means, being allowed the use of any possible technological means, provided that legal certainty is guaranteed[13].

Assuming a substantial nature, this amendment requires transposition by the Member States until 14th January 2019[14]. However, given that the TMD does not lay down specific representation requirements - thus remaining the risk that the desired legislative approximation will not be achieved on this point, since some types of signs may be registered as trade marks in some Member States and rejected in others -, the European Trade Mark and Design Network (which includes the European Union Intellectual Property Office [EUIPO]), the Intellectual Property Offices of the Member States (including, of course, the Portuguese Institute of Industrial Property [*INPI, Instituto Nacional da Propriedade Industrial*]) adopted a Common Communication on this subject[15].

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[13] Carvalho, Maria Miguel, «A nova diretiva europeia…», *cit.*, p. 98.

[14] V. article 54(1) of the TMD.

[15] This Common Communication can be found at: https://euipo.europa.eu/tunnel-web/secure/webdav/guest/document_library/contentPdfs/about_euipo/who_we_are/common_communication/common_communication_8/common_communication8_en.pdf (visited, for the last time, on 26 April 2018).

This Common Communication – which has no legally binding effect[16] – aims to «facilitate the transposition process and strengthen the harmonising impact of the new directive» by promoting the uniform and consistent application of the new provisions in the European Trade Mark Law through information on the understanding reached in the context of the debate on common approaches to the «definitions and representation requirements for the new types of trade marks resulting from the abolishment of the graphical representation requirement»[17].

This will happen before the legislative process for the transposition of the TMD in each Member State begins[18] – by providing «structured information in a transparent manner, with a view to facilitating pre-legislative alignment, on the types of marks, their definitions and means of representation in respect of each Office»[19] – but also after its conclusion. Therefore, this document will be updated regularly and bi-annually[20].

In the version made available to this date, the Common Communication mentions two substantive issues.

On the one hand, it addresses the definitions and means of representation for the different types of marks, based on those established in article 3 of the

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[16] Furthermore, as stated in the same Communication, it should also not be read or interpreted "(...) as containing specific undertakings by Member States that would limit their freedom to make their own choices within the framework of the provisions of the new Trade Mark Directive" – Common Communication, *cit.*, p. 2.

It should also be noted that this Communication is part of a more comprehensive programme - the Convergence Programme of the European Union Intellectual Property Office (EUIPO) - launched in 2011 and which links the EUIPO, the national industrial property offices and user associations in order to reach a common base in areas where different practices occur. For further developments, v. https://www.tmdn.org/network/converging-practices.

[17] Common Communication, *cit.*, p. 3.

[18] In the case of the European Union trade mark, in addition to the Common Communication and the Implementing Regulation (referred to in the text and footnote 19, respectively), the provisions of the EUIPO in the «Guidelines for Examination in the Office, Part B, Examination, Final version, 1.0 01/10/2017» should be taken into account, especially «Section 4 Absolute grounds for refusal Chapter 2 EUTM Definition (article 7 (1)(a) EUTMR)», available for consultation at https://euipo.europa.eu/tunnel-web/secure/webdav/guest/document_library/contentPdfs/law_and_practice/trade_marks_practice_manual/WP_2_2017/Part-B/04-part_b_examination_section_4_absolute_grounds_for_refusal/part_B_examination_section_4_chapter_2/part_B_examination_section_4_chapter_2_EUTM%20definition_en.pdf (visited, for the last time, on 26 April 2018).

[19] Common Communication, *cit.*, p. 3.

[20] The first update is scheduled for 1 June 2018 (information collected at: https://euipo.europa.eu/ohimportal/en/news?p_p_id=csnews_WAR_csnewsportlet&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_count=2&journalId=3941045&journalRelatedId=manual/, visited, for the last time, on 26 April 2018).

Implementing Regulation of the EUTM[21/22], differentiating the word; figurative; shape; position; pattern; colour; sound; motion; multimedia and hologram trade

[21] Implementing Regulation (EU) 2017/1431 of the Commission, of 18 May 2017 which establishes the rules for implementing certain provisions of Council Regulation (EC) No 207/2009 on the EU trade mark, *OJ L* 205, of 8 August 2017, 39 ff. [Implementing Regulation of the EUTM].
This rule states the following:
"1. The trade mark shall be represented in any appropriate form using generally available technology, as long as it can be reproduced on the register in a clear, precise, self-contained, easily accessible, intelligible, durable and objective manner so as to enable the competent authorities and the public to determine with clarity and precision the subject-matter of the protection afforded to its proprietor.
2. The representation of the trade mark shall define the subject matter of the registration. Where the representation is accompanied by a description pursuant to paragraph 3(d), (e), (f)(ii), (h) or paragraph 4, such description shall accord with the representation and shall not extend its scope.
3. Where the application concerns any of the trade mark types listed in points (a) to (j), it shall contain an indication to that effect. Without prejudice to paragraphs 1 or 2, the type of the trade mark and its representation shall accord with each other as follows:
a) in the case of a trade mark consisting exclusively of words or letters, numerals, other standard typographic characters or a combination thereof (word mark), the mark shall be represented by submitting a reproduction of the sign in standard script and layout, without any graphic feature or colour;
b) in the case of a trade mark where non-standard characters, stylisation or layout, or a graphic feature or a colour are used (figurative mark), including marks that consist exclusively of figurative elements or of a combination of verbal and figurative elements, the mark shall be represented by submitting a reproduction of the sign showing all its elements and, where applicable, its colours;
c) in the case of a trade mark consisting of, or extending to, a three-dimensional shape, including containers, packaging, the product itself or their appearance (shape mark), the mark shall be represented by submitting either a graphic reproduction of the shape, including computer-generated imaging, or a photographic reproduction. The graphic or photographic reproduction may contain different views. Where the representation is not provided electronically, it may contain up to six different views;
d) in the case of a trade mark consisting of the specific way in which the mark is placed or affixed on the goods (position mark), the mark shall be represented by submitting a reproduction which appropriately identifies the position of the mark and its size or proportion with respect to the relevant goods. The elements which do not form part of the subject-matter of the registration shall be visually disclaimed preferably by broken or dotted lines. The representation may be accompanied by a description detailing how the sign is affixed on the goods;
e) in the case of a trade mark consisting exclusively of a set of elements which are repeated regularly (pattern mark), the mark shall be represented by submitting a reproduction showing the pattern of repetition. The representation may be accompanied by a description detailing how its elements are repeated regularly;
f) in the case of a colour mark,
i) where the trade mark consists exclusively of a single colour without contours, the mark shall be represented by submitting a reproduction of the colour and an indication of that colour by reference to a generally recognised colour code;
ii) where the trade mark consists exclusively of a combination of colours without contours, the mark shall be represented by submitting a reproduction that shows the systematic arrangement of the colour combination in a uniform and predetermined manner and an indication of those colours by reference to a generally recognised colour code. A description detailing the systematic arrangement of the colours may also be added;
g) in the case of a trade mark consisting exclusively of a sound or combination of sounds (sound mark), the mark shall be represented by submitting an audio file reproducing the sound or by an accurate representation of the sound in musical notation;
h) in the case of a trade mark consisting of, or extending to, a movement or a change in the position of the elements of the mark (motion mark), the mark shall be represented by submitting a video file or by a series of sequential still images showing the movement or change of position. Where still images are used, they may be numbered or accompanied by a description explaining the sequence;
i) in the case of a trade mark consisting of, or extending to, the combination of image and sound (multimedia mark), the mark shall be represented by submitting an audiovisual file containing the combination of the image and the sound;
j) in the case of a trade mark consisting of elements with holographic characteristics (hologram mark), the mark shall be represented by submitting a video file or a graphic or photographic reproduction containing the views which are necessary to sufficiently identify the holographic effect in its entirety.
4. Where the trade mark is not covered by any of the types listed in paragraph 3, its representation shall comply with the standards set out in paragraph 1 and may be accompanied by a description.
5. Where the representation is provided electronically, the Executive Director of the Office shall determine the formats and size of the electronic file as well as any other relevant technical specifications.
6. Where the representation is not provided electronically, the trade mark shall be reproduced on a single sheet of paper separate from the sheet on which the text of the application appears. The single sheet on which the mark is reproduced shall contain all the relevant views or images and shall not exceed DIN A4 size (29,7 cm high, 21 cm wide). A margin of at least 2,5 cm shall be left all around.
7. Where the correct orientation of the mark is not obvious, it shall be indicated by adding the word 'top' to each reproduction.
8. The reproduction of the mark shall be of such quality as to enable it to be: (a) reduced to a size of not less than 8 cm wide by 8 cm high; or (b) enlarged to a size of not more than 8 cm wide by 8 cm high.
9. The filing of a sample or a specimen shall not constitute a proper representation of a trade mark".

[22] V. also EUIPO, «Guidelines for Examination…», *cit*.

mark; - for which it lays down the admissible form of representation[23] - from the other types of marks, establishing for these the principle of admissibility of representation «in any appropriate form using generally available technology, as long as it can be reproduced on the register in a clear, precise, self-contained, easily accessible, intelligible, durable and objective manner so as to enable the competent authorities and the public to determine with clarity and precision the subject-matter of the protection afforded to its proprietor», while also foreseeing the possibility of being accompanied by a description.

On the other hand, the Common Communication indicates which electronic file formats are acceptable for non-traditional trademarks, admitting a «mono-format»[24] - given the lower build-in and maintenance costs, and better interoperability between systems when conducting searches[25] - without excluding, however, the acceptance of other formats.

In the Portuguese Law, as mentioned, there is still a requirement for the susceptibility of graphic representation (article 222), so it will be effectively necessary to amend this and all the rules in which it is foreseen (*v.g.*, article 234(1)), in order to eliminate and replace it with the representation requirement that respects the characteristics mentioned[26].

However, in addition to the changes in the legal order for trade marks, determined by the new TMD, it is also necessary to transpose, into the internal legal system, the Directive 2016/943 of the European Parliament and of the Council of 8 June 2016 on the protection of undisclosed know-how and business information (trade secrets) against their unlawful acquisition, use and disclosure, and to simplify and clarify the administrative procedures relating to the aquisition, maintenance and cancelation of the industrial property rights foreseen in the CPI, as well as introduce mechanisms that strengthen the system for the protection of those rights and foster effectiveness on the repression of

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[23] V. the different paragraphs of article 3(3) of the Implementing Regulation of the EUTM, which are almost identical to the previsions in Table 1 of the Common Communication (v. p. 4). Excluding one word or another (replaced by a synonym), the only difference concerns the omission, in relation to the form of representation of three-dimensional trade marks, of the limitation – which appears in the final part of article 3(3)(c) of the Implementing Regulation of the EUTM – to six views if the representation is not submitted electronically.
In Portugal, however, the forms of representation referred to are not yet in force, as is noted in https://inpi.justica.gov.pt/Portals/6/PDF%20INPI/Not%C3%ADcias%20-%20ficheiros%20de%20apoio/PT%20Common%20Communication%20-%20Portal%20Justi%C3%A7a.pdf?ver=2017-11-30-145429-233 (visited, for the last time, on 26 April 2018).

[24] V. Common Communication, *cit.*, 5 ff.

[25] V. Common Communication, *cit.*, 5 f.

[26] Carvalho, Maria Miguel, «A nova diretiva…», *cit*., 97 ff.

violations[27], it is the intention of the Portuguese Government to approve a *new* CPI, and work is currently underway to prepare that proposal[28].

In the proposal we had access to[29] - and not knowing if it corresponds to the law authorising the Government to approve the new Industrial Property Code[30] -, which distances itself from the initial regulatory change project[31], it was foreseen that a trade mark could be constituted by a sign or a set of signs capable of being represented graphically, namely words, including personal names, designs, letters, numerals, sounds, colour, shape of the product or its packaging, or a sign or set of signs which may be represented in a manner which enables the subject-matter of the protection afforded to the proprietor to be determined, in a clear and precise manner, provided they are capable of appropriately distinguishing the goods or services of one undertaking from those of other undertakings. Therefore, it is proposed a *disjunctive* provision [32] regarding representation , which is criticisable in our opinion, since it would appear that susceptibility

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[27] Preamble to the CPI Proposal, cited *infra.*

[28] In fact, on 26 April 2018, the Council of Ministers approved the law authorising the Government to approve the new Industrial Property Code (v. https://www.portugal.gov.pt/pt/gc21/governo/comunicado-de-conselho-de-ministros?i=205 and https://justica.gov.pt/Noticias/Governo-aprova-Revisao-do-Codigo-da-Propriedade-Industrial).
Although, at first, only the amendment to the CPI was still in force, as it also appears from the wording of Order No 10126/2017, of 10 November 2017 (DR, 2nd series, No 225, of 22 November 2017, 26337 ff.), which constituted "a CPI Review Working Group with the main objective of analysing the current CPI project, which includes the contributions of the interested parties" (our translation) and that should present its conclusions until 15 December 2017, (v. paragraphs 1 and 2 of said Order).

[29] We had access to this proposal because an opinion about it had been requested from the Portuguese Association of Intellectual Law (*APDI, Associação Portuguesa de Direito Intelectual*), in which we had the opportunity to participate, co-authoring with Vicente, Dário Moura/Marques, João Paulo Remédio/Almeida, Alberto Ribeiro de/Silva, Ana Pereira da. It should also be noted that APDI is part of the working group referred to in the previous footnote (v. 4(d) of the aforementioned Order).
On the preparatory work, cf. Marques, João Paulo Remédio, «Algumas notas sobre a revisão do CPI, no quadro do grupo de trabalho constituído na Secretaria de Estado da Justiça», in: *Revista de Direito Intelectual,* No 1, 2018, 195 ff..

[30] V. footnote 28.

[31] We had access to this document in the same terms explained in footnote 29.
In this initial proposal, regarding this point, the elimination of the requirement of susceptibility of graphic representation of number 1 of article 222 was contemplated and is replaced by the requirement of representation in a way which clearly and precisely identifies the subject-matter of the protection afforded to its proprietor and appropriately distinguishes the goods or services of one company from those of other companies.

[32] In fact, the disjunctive provision is highlighted in the preamble to the new CPI proposal to which we have had access and we do not know, as we have already mentioned, if it is part of the authorization law approved by the Council of Ministers.

of graphic representation is required for a sign or a set of signs which may be, according to the list of examples referred to therein, word, figurative, colour or shape «trade marks» while for the remaining signs (sign or set of signs), the representation must be in a manner which, clearly and precisely, determines the subject-matter of the protection afforded to its proprietor.

It may be said that this provision is aligned with the provision of the Implementing Regulation of the EUTM and the content of the Common Communication referred *supra*[33]. However, on the one hand, this approximation is only partial (since it does not specifically refer to all types of trade marks referred to therein – *v.g.* position, pattern, sound, motion, multimedia and hologram trade marks[34]), as it omits the initial provision of the referred Implementing Regulation – v. article 3(1) – that establishes which should be the rule - «The trade mark should be represented *in any appropriate form using generally available technology, as long as it can be reproduced on the Register in a clear, precise, self-contained, easily accessible, intelligible, durable and objective manner so as to enable the competent authorities and the public to determine with clarity and precision the subject matter of the protection afforded to its proprietor*» [our italic] - and, on the other hand, it seems to ignore the concept of normative regulatory provisioning and even the non-binding nature of the Common Communication[35]...

Therefore, it would be preferable to establish *one single requirement* regarding the representation of the sign to be registered as a trade mark, since, as we have referred, it would have to comply with what is foreseen in the Trade Mark Directive (as it appeared in the initial draft proposed for the amendment of article 222(1) referred to above[36]), that is to say, it must be formulated in a manner that allows *any form of representation that enable to determine, clearly and precisely, the subject matter of the protection afforded to its proprietor.* Of course, graphic representation – depending on the specific case – may be sufficient. For the remaining cases, the specification of the forms of representation may be left to a possible Implementing Regulation or to guidelines provided by INPI, which may (and should) be aligned with the position adopted in the Common Com-

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[33] This also seems to result from the preamble to the new CPI proposal to which we have had access and we do not know whether it appears in the authorization law approved by the Council of Ministers.

[34] Regarding these, v., respectively, paragraphs d), e), g), h), i) and j) of article 3(3) of the Implementing Regulation of the EUTM.

[35] V. footnote 15 *supra*.

[36] V. footnote 29 *supra*.

munication. Moreover, this is the direction that is being projected in other legal orders in the EU (as is the case of Spain[37]).

2. The scope of the legal amendment for non-traditional trade marks

Focusing on the subject of the present study, it is important to determine the scope of the legal amendment implemented by the Directive.

As we mentioned, the previous requirement for susceptibility of graphic representation was eliminated. However, the reasons for its requirement remain. In other words, it continues to result from the adoption of a registration system to the acquisition of trade mark rights the need for a representation that will technically facilitate the operability of that system and, at the same time, guarantee legal certainty. Thus, in order for a sign, which is capable of distinguishing goods or services, to be registered as a trade mark, it must be capable of being represented in *any form that is technologically possible*, but it must always enable the competent authorities and the public to determine, clearly and precisely, the subject matter of the protection afforded to the trade mark proprietor.

2.1. New technologies and the Internet of Things

The technologically possible form is something that is constantly evolving. And while it is true that a great deal of progress has already been made – compared to the initial trade mark registration situation – where we highlight the possibility, at least in national law, of submitting the application for registration digitally[38] and of representation in electronic format for some types of

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[37] In Spain, in *Anteproyeto de Ley de modificación parcial de la Ley 17/2001, de 7 de diciembre, de Marcas* (available for consultation at http://www.oepm.es/export/sites/oepm/comun/documentos_relacionados/Propiedad_Industrial/Normativa/AnteproyectoLeyModificacionParcialLey172001_7dic_Marcas.pdf, visited, for the last time, on 26 April 2018), it is foreseen in article 2 the amendment of the current article 4 of the *Ley de Marcas*, that states: "A trade mark may consist of all signs, especially words, including names of natural persons, drawings, letters, numbers, colours, shape of the product or its packaging, sounds, provided that such signs are appropriate to:

a) distinguish the goods or services of one undertaking from those of other undertakings and
b) be represented in the Trade Mark Register in a manner so as to enable the competent authorities and the public to determine with clarity and precision the subject matter of the protection afforded to its proprietor" (our translation).

[38] V. article 10-A of the CPI. Online registration is done on the website: https://servicosonline.inpi.pt/registos/main/start.jsp?timo=M.

marks[39], enormous changes are expected in the near future, making it also worth briefly mentioning the new possibilities opened up by the Internet of Things (IoT) and artificial intelligence (AI).

The IoT refers to the capacity of all objects («things») to be permanently connected to the Internet, identified on the network and able to communicate with each other[40]. AI refers to the capacity of a computer or robot to perform tasks, usually reserved for intelligent beings, to machines that react like human beings, who have autonomous decision-making skills. Both may be relevant regarding the registration of trade marks[41].

In fact, the trade mark's legal regulation may come to reflect, if this is to happen, a change in the products/services' marketing model referred to, among others, by Lee Curtis and Rachel Platts. We refer to the suggested modification of the traditional paradigm, which presupposes an interaction between people and trade marks (reactive system), to a decision based on predictions determined by a form of artificial intelligence (prediction system) and that potentially withdraws the human consumer from the process of acquisition of products/services[42].

This model – where products are purchased *automatically* (based on predictions[43/44]) and sent, for example, to the consumer's home – raises several questions regarding management and marketing (for instance, how exactly do different forms of artificial intelligence choose products? Based on trade marks or

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[39] V., for instance, the case of the sound signs for whose registration must be presented the corresponding musical phrases or a digital representation of the sign recorded in MP3 or WAVE format – 4.1.2.(d) of Order No 357/2014, of 6 March (amended by Order No 9179/2016, of 8/7/2016, republished in the DR, 2nd Series, No 137, of 19/07/2016, 22103 ff.) that establishes the regulation of the applications' formal requirements and the instruction documents for the requests of concession of exclusive industrial rights.

[40] The *Internet Society*'s definition of IoT generally refers to scenarios in which network connectivity and computing capacity is extended to objects, sensors, and everyday objects that are not normally considered computers, allowing these devices to create, exchange and consume data with minimal human intervention. V. *Internet Society* - «The Internet of things: an overview», October, 2015, available for consultation at: https://cdn.prod.internetsociety.org/wp-content/uploads/2017/08/ISOC-IoT-Overview-20151221-en.pdf (visited, for the last time, on 26 April 2018).

[41] It also raises issues that are very relevant to industrial property, in general, and to certain exclusive industrial rights, in particular, that are not addressed here for economic reasons.

[42] Cf. Curtis, Lee/Platts, Rachel, «AI is coming and it will change trade mark law» (available at: http://www.hgf.com/media/1173564/09-13-AI.PDF, visited, for the last time, on 26 April 2018).

[43] The cited authors refer, as an example for the future, the possibility of our refrigerator having the ability to monitor its contents and order products such as cheese or milk (*op. cit.*, p. 12).

[44] They may come to constitute as examples of these antecedents, although in a very incipient and non-automatic manner, the suggestions for purchasing products based on previous choices or visits that already exist today.

only on price and/or quality?), but also regarding the Law and, particularly in the context of this study, on Trade Mark Law. *V.g.*, how likely is artificial intelligence to be misleaded in the case of the imitation of a trade mark? Can it be confused or even associate similar trade marks? Can it be considered a «consumer», as it is currently considered in the European Trade Mark Law? If so, how will the «average consumer»[45] be determined? And also, from a different perspective, how can artificial intelligence be used to protect trade marks more effectively?[46]

Notwithstanding the relevance of all these (and many other) questions, for the present study, it is important that two aspects should be emphasised.

One concerns the registration process itself.

Until now, even online registration supposes some human intervention. But, in the more or less near future, it may be possible that the registration application is completely analysed by devices connected to other devices or computers which, with access to digital data (data bases; devices which allow the representation of «non-traditional» signs, etc.), and analysing all available information, automatically decide whether to grant or refuse the registration of a sign as a trade mark, perhaps with a smaller margin of error.

Another aspect, with even more interest for the subject under analysis, concerns the susceptibility of the representation of signs, especially in the cases of the so-called «non-traditional» trade marks.

In addition to the fact that technological advances have made it possible to eliminate the legal requirement concerning the susceptibility of the *graphic* representation of the signs to be registered as a trade mark, since it is already technologically possible to represent some of those «non-traditional» signs (v.,

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[45] These and other questions are raised in the work cited, which, in turn, is heavily based on studies by economists (namely, Agrawal, Ajay/Gans, Joshua/Goldfarb, Avi, authors of several articles published in 2017 in the *Harvard Business Review*, for instance, of 3 October 2017, «How AI Will Change Strategy: A Thought Experiment», available for consultation at https://hbr.org/product/how-ai-will-change-strategy-a-thought-experiment/H03XDI-PDF-ENG, visited, for the last time, on 26 April 2018).

[46] On the role of artificial intelligence regarding trade mark protection, v. also, «Protect Your Trademark with Artificial Intelligence» (available for consultation at https://news.developer.nvidia.com/protect-your-trademark-with-artificial-intelligence/, visited, for the last time, on 26 April 2018) and also Meale, Darren, «The future of trade marks: my co-worker is a robot», in: *Journal of Intellectual Property Law & Practice*, Vol. 13, 2018, No 2, p. 91.

for example, the sound trade mark[47], the shape trade mark[48], the colour trade mark[49]), it is anticipated that *new* forms of representation may arise – namely

[47] The form of representation of sound signs has already been the subject of a CJEU decision. V. the Judgment of 27 November 2003, delivered in the scope of the case C-283/01, which opposed Shield Mark BV to Joost Kist h.o.d.n. Memex, «Shield» case.

For a comment on this judgment, cf. Martinez Gutiérrez, Ángel, «En torno a la descripción como forma de representación gráfica de un signo olfactivo», in: *Actas de Derecho Industrial y Derecho de Autor*, Tomo XXVI, 2005-2006, 527 ff.

As we have already pointed out in another study, the difficulties in graphically representing this type of signs are essentially related to finding a mean that fulfill the «Sieckmann» criteria, i.e., a form of representation, namely by figures, lines or characters, which is clear, precise, self-contained, easily accessible, intelligible, durable and objective. For this purpose, the doctrine has proceeded to the differentiation between musical sounds and other sounds.

In the first case, the representation by means of a stave (i.e., by a score divided in tempos and which includes, in particular, a clef, musical notes and silences, whose form indicates the relative value and, if necessary, accidentals) has been accepted. However, some authors also admit the relevance of the indication of the title or of a description that allows the clear and precise identification of the concrete sound when it is a sound (or a set of sounds) known to the public.

In the remaining cases, in the impossibility of representation by stave, the admissibility of other forms of representation, such as the use of a verbal description of the sound and the digital recording of the sound, is discussed.

In the «Shield» case, the CJEU – by limiting its assessment to the means of graphic representation actually presented – considered that the «Sieckmann» criteria are not observed when the sign is graphically represented by musical notes or by a simple onomatopoeia without other accuracy and may not be respected by the verbal description. But it admitted the representation through the stave.

As we have seen with respect to olfactory signs, also/as well in the case of sound marks which cannot be represented by a stave, the possibility of constituting a trade mark, admitted by the CJEU, is endowed with technical difficulties, a situation which is increased by the fact that other forms of representation currently available of such signs (and some used in other legal orders) have not been analysed.

In fact, in addition to digital recordings, it is possible to use graphics such as the oscillogram and the spectrogram or the sonogram to represent non-musical sounds, however, doubts have been raised regarding the accessibility and understanding of these means by the general public.

After the amendment, in 2008, of the CPI still in force, the Portuguese legislator expressed some openness in this matter, since in article 234(1), it is now accepted that the graphic representation of sound signs be made through the respective musical phrases, in support defined by an order of the president of the INPI board of directors.

Currently, as we have already mentioned *supra*, this representation is admitted through «musical phrases or a digital representation of the sign to be recorded in MP3 or WAVE format» (our translation) (Order No 3571/2014, of 6 March, amended by Order No 9179/2016, of 8 July, in: *DR,* 2nd Series, No 137, of 19 July 2016, 22103 ff.).

In Portugal, two national sound trade marks have already been registered. The first is the national trade mark No 480308, to distinguish insurances and was represented as a stave and accompanied by a multimedia audio file - v. https://www.inpi.pt/portal_resources/sons/3415601.mp3. Registration was granted on 16 November 2011. The second is the national trade mark No 531888, to distinguish intellectual property legal and consultancy services and was represented as a stave and accompanied by a multimedia audio file - v. https://www.inpi.pt/portal_resources/sons/5150301.mp3. Registration was granted on 19 September 2014.

[48] On the three-dimensional trade mark, cf. Carvalho, Maria Miguel, «O registo de marcas de forma no âmbito da jurisprudência europeia», in: *Cadernos de Direito Privado*, No 55, 2016, July/September, 23-31 ff. and also Gonçalves, Luís M. Couto, «Marca tridimensional», in: *Nos 20 anos do Código das Sociedades Comerciais – Homenagem aos Profs. Doutores A. Ferrer Correia, Orlando de Carvalho e Vasco Lobo Xavier*, Vol. I (Congresso, empresas e sociedades), Coimbra, School of Law of the University of Coimbra/Coimbra Editora, 2007, 139 ff. and referring to the Industrial Property Code of 1940, Serens, M. Nogueira, «Parecer», in: *Colectânea de Jurisprudência*, Ano XVI, Tomo IV, 1991, 59 ff.

[49] On the subject, cf., among us, Carvalho, Maria Miguel «A possibilidade de registo como marca da cor per se», in: *Estudos em comemoração dos 20 anos da Escola de Direito da Universidade do Minho* (org. Mário Ferreira Monte/Joaquim Freitas da Rocha/Joana Aguiar e Silva/Elizabeth Fernandez), Coimbra, Coimbra Editora, 2014, 469-487 ff. and «A proteção jurídica da cor única como marca no âmbito da indústria da moda – breves notas a propósito dos casos da «sola lacada a cor vermelha», in: *Actas de Derecho Industrial y Derecho de Autor* (Espanha), vol. XXXIV, 2013-2014,137-152 ff.

electronic sensing or e-sensing – regarding signs whose registration has been denied (also[50]) because of the impossibility of representation in the forms legally required until now, as is the case, for example, of olfactory[51], gustatory[52] and tactile[53] trade marks, in the scope of European law.

In this context, future technological developments may make it possible to overcome some of the barriers that have been placed on them in certain legal orders[54], serving as examples of the development of «digital scent technology»

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[50] We say «also» because non-traditional trade marks often fulfill other grounds to refuse the registration. V. 3 *infra*.

[51] On the possibility of registering olfactory signs, cf., among us, Cruz, Rui Solnado da, *A marca olfactiva,* Coimbra, Almedina, 2008.

At the European level, the then Office for Harmonisation in the Internal Market [OHIM] (now EUIPO) granted the (community) trade mark registration of «the smell of freshly cut grass» for tennis balls (V. Decision of the Second Board of Appeal of 11 February 1999 in Case R 156/1998-2, concerning the application for registration No 428 870 («the smell of freshly cut grass»)), which has meanwhile expired. However, following the Court of Justice Judgment in the «Sieckmann» case, this possibility began to be rejected, v., for example, the Judgment of the then Court of First Instance, of 27 October 2005, regarding case T-305/04, where the registration of «the smell of ripe strawberry» to mark products of classes 3, 16, 18, 25 was discussed. For a commentary on this judgment, cf. Martinez Gutiérrez, Ángel, *op. cit.*, 739 ff.

On the problems raised by the olfactory trade mark, cf. Karapapa, Stavrovla, «Registering scents as community trade marks», in: *The Trade Mark Reporter*, 100, 2010, No 6, 1335 ff. (available for consultation at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2574642, visited, for the last time, on 26 April 2018).

[52] We would like to recall that, while the requirement for susceptibility of graphic representation was in force, OHIM refused to register any gustative sign as a community trade mark (the current European Union trade mark). V. the decision of the Second Board of Appeal of 4 August 2003 in the case R 120/2001-2, regarding the taste of artificial strawberry flavouring to mark pharmaceutical products.

[53] Gonçalves, Luís M. Couto («Marca tridimensional», *cit.*, 143 f.) refers to as a tactile mark, although disguised as a three-dimensional mark, the application for community trade mark of optical lenses with a particular touch, which was assessed and rejected by the OHIM Board of Appeal in the «Five Ribs» case, by the decision of 21 March 2001 (R-0448/1999-2).

On the registration of this type of trade marks in the USA, cf. Monteiro, Christina S. («A Non-traditional Per-Spectrum: The Touch of Trademarks», in: *INTA Bulletin*, June 15, 2010, Vol. 65, No 11, available for consultation at http://www.inta.org/INTABulletin/Pages/ANontraditionalPerSpectrum.aspx (visited, for the last time, on 26 April 2018), which indicates, for example, the registration, in 2006, by *American Wholesale Wine & Spirits, Inc.* of trade mark No 3,155,702, for a tactile mark, alone or used with the Khvanchkara wine, described in the register as «a velvet textured covering on the surface of a bottle of wine».

It should also be noted that INTA's [International Trademark Association] Board has adopted a resolution favouring the extension of recognition, protection and registration of tactile marks under appropriate circumstances (v. http://www.inta.org/Advocacy/Pages/ProctectabilityofTouchMarks.aspx, visited, for the last time, on 26 April 2018).

[54] Cf. Sergio Balaña («El entorno digital? segunda oportunidad para la marca olfativa? Estudio acerca de la capacidad del signo olfativo para funcionar como marca en el mercado», in: *Actas de Derecho Industrial*, Tomo XXVI, 2005-2006, 25 ff.) which refers, in particular, to telematic networks.

Cf. also the study on «virtual reality environment» by Wilson, Caroline «Trade mark law in an online future – coming to its senses?», of 19 September 2007, consulted on the Internet at the website: http://www.law.ed.ac.uk/ahrc/gikii/docs2/wilson.pdf (visited, for the last time, on 9 April 2018).

(or «olfactory technology»), the so-called «electronic noses» (or «e-noses»)[55] – devices that incorporate chemical sensors, which analyse scent, collect qualitative and quantitative information regarding their composition and identify it by standardised methods of recognition, generating an «image» of the scent in a graphic form, which will include colour, in the case of «colorimetric electronic noses»[56]; «smelling screens» (screens with devices that emit scents on specific parts of the emitted images)[57] and also «scent domes» (peripheral devices, connectable to computers, which create simulations of scents for their users, by vaporisation and emission through the device in the direction of the user's nose, based on order processing, sent by a computer programme or digital file, resulting in a combination of aromatic oils - synthesised from natural fragrances - which are found inside this device, in «replaceable cartridges»)[58].

More incipient seems to be the digital technology regarding gustatory signs[59] and haptic or tactile signs[60].

2.2. The meaning of the reference to the «Sieckmann» criteria in the Trade Mark Directive

Although the Directive stipulates, as a rule, the admissibility of the representation of the sign *in any appropriate form, using generally available tech-*

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[55] As referred by Wilson, Alphus D./Baietto, Manuela, «Applications and Advances in ElectronicNose Technologies», in: *Sensors*, 2009, 9(7), 5099-5148 ff. (available for consultation at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3274163/pdf/sensors-09-05099.pdf, visited, for the last time, on 9 April 2018), the term «electronic nose» was coined by Gardner, J.W./Barlett, P.N., in 1988. For further developments, cf., by the last-mentioned authors, *A brief history of electronic noses*, Sens. Actuat. B: Chem 1994, 18, 211–220 ff., https://doi.org/10.1016/0925-4005(94)87085-3 (visited, for the last time, on 26 April 2018).

[56] Karapapa, Stavrouvla, *op. cit*., 1355 ff.

[57] Cf., on this subject, La Diega, Guido Noto, «Non-conventional marks: the EU reform of trade marks, Brexit, and the Internet of Things», in: *Diritto Mercato Tecnologia*, 16 January 2018, esp. 11 f. (available for consultation at: https://www.dimt.it/index.php/it/notizie/16608-non-conventional-marks-the-eu-reform-of-trade-marks-brexitand-the-internet-of-things, visited, for the last time, on 26 April 2018).

[58] Karapapa, Stavrouvla, *op. cit.*, 1355 ff.

[59] Regarding these, cf. Ranasinghe, Nimesha/Cheok, Adrian David/Fernando, Owen Noel Newton/Nii, Hideaki/Gopalakrishnakone, Ponnampalam, «Digital Taste: Electronic Stimulation of Taste Sensations», in: *International Joint Conference on Ambient Intelligence*, 2011, 345 ff., https://doi.org/10.1007/978-3-642-25167-2_48.

[60] Regarding these cf. Wassom, Brian, «A distinctive touch: augmented textures and haptic trademarks», 21/07/2011, http://www.wassom.com/a-distinctive-touch-augmented-textures-and-haptic-trademarks.html (visited, for the last time, on 26 April 2018).

nology, the truth is that, as we have already mentioned, it has not gone without expressly stating that, in order to «ensure legal certainty and sound administration, it is also essential to require that the sign is capable of being represented in a manner which is clear, precise, self-contained, easily accessible, intelligible, durable and objective» (v. Recital 13 of the TMD), which seems to reaffirm the seven «Sieckmann» criteria, making it important to reflect briefly on the meaning of this reference.

For some authors, the elimination of the requirement for the susceptibility of graphic representation, determined by the TMD, will imply the elimination of the «Sieckmann»[61] criteria. For others, however, the suppression of graphic representation will not «"open the door" to the registration of unconventional trade marks», defending that «the representation requirements remain very strict»[62]. There is also another doctrine that defends that the new legal configuration may imply a different interpretation of those jurisprudential guidelines[63].

We personally believe that if the criteria are explicitly mentioned in the Directive's Recitals , this must mean that the legislator has been sensitive to their need and goodness, and should therefore continue to be applied, even if the consideration of new forms of representation – other than graphic – may effectively come to require a *different* interpretation, in order to take into account the specificities resulting from their character, but without neglecting the need to ensure legal certainty and the registration system management.

3. Final remarks

Notwithstanding the admissibility of new forms of representation, which may facilitate the registration of certain non-traditional signs (v., for example, sound signs, holograms, position trade marks), we believe that for others, the grounds for refusal of registration will remain, at least for now.

Moreover – *and this is the most important point for us* – even if a sign can be represented, by any form that is technologically possible and meets the referred criteria, that does not mean that it can be necessarily registered as a trade mark.

In fact, the trade mark is a *distinctive* sign of goods or services and, therefore, only distinctive, differentiating signs can be registered as trade marks. The problem that affects many of these non-traditional signs concerns this (in)apti-

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[61] In this sense, cf., Sahin, Onus, «The past, the present and the future of colour and smell marks», in: *European Intellectual Property Review,* 2016, 38 (8), p. 513.

[62] Gonçalves, Luís M. Couto, *Manual de Direito Industrial – Propriedade Industrial e Concorrência Desleal*, 7th edition, revised and updated, 2017, p. 201.

[63] Cf., in this sense, La Diega, Guido Noto, *op. cit.,* p. 6.

tude and this is not solved by the acceptance of non-graphic forms of representation, even though these may not question legal certainty. Therefore, we agree with LaLonde/Gilson: "the tension between nontraditional trademarks used in sensory marketing and the trademark requirement of identifying the source of products is palpable. A trade mark *must* identify the source, and if a scent or flavor or texture just makes a product smell, taste or feel more desirable, that may well be its legal death knell"[64], since it also raises further grounds for refusal of its registration (*v.g.* functionality)[65].

It remains to be seen whether if, also here, technology – and in particular artificial intelligence – may change the *status quo* by influencing the signs' distinctive capacity and/or whether it implies a new (average)[66] consumer paradigm or a different conception of the trade mark and the functions performed by this distinctive sign.

[64] Lalonde/Gilson, *op. cit.*, p. 217. The authors also add that "in terms of trademark protection, marketing can also be self-destructive in directing consumers to a product's useful features." Cf. also Aurea Suñol, «Las marcas no convencionales: signos gustativos, sonoros y olfativos», 16 Nov 2016, in: *Almacén de Derecho* (http://almacendederecho.org/las-marcas-no-convencionales-signos-gustativos-sonoros-olfativos/, visited, for the last time, on 26 April 2018).

[65] For further developments on this point, cf., among others, Hughes, Justin, «Non-Traditional Trademarks and the Dilemma of Aesthetic Functionality», *Loyola Law School, Los Angeles Legal Studies Research Paper* No 2017-15 (available for consultation at http://dx.doi.org/10.2139/ssrn.2946257, visited, for the last time, on 26 April 2018). This study will be published in *The Protection of nontraditional marks: critical perspectives* (Irene Calboli and Martin Senftleben, eds.), in press.

[66] V. 2.1 *supra*.

ROBOTIC SOFTWARE INTELLECTUAL PROPERTY [1]

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Abstract: Is software executed by robots protected by intellectual property rights? If so, which branch of IP applies to robotic software: copyright, patents, trade-secrets, all together? This paper focus on robots generated by humans and increasingly provided with artificial intelligence (AI). Will IP be an obstacle to the development of artificial intelligence or rather a stimulus in the evolutionary process?

Keywords: robotics – software – intellectual property

Summary: 1. Introduction. 2. Legal protection of robotic software. 3. Copyright in the Software. 4. Trade Secrets. 5. Patents for inventions related to computer programs. 6. Patenting the brains of robots? 7. Patents for robotic prostheses (i.e. replicas of parts of the human body). 8. Conclusion.

1. Introduction

The robot is, basically, an automaton whose functionality, mobility and ability to communicate and learn depends on the model. The meaning of the word robot ranges from the toy dog-robot to Sofia, passing through the auto-

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matons of industrial production, especially in the automotive, electronic or textile sectors.

Robots execute instructions programmed in the form of software. The software is the computer program, i.e. the set of instructions performed or executed by a computer device, namely a computer or a smartphone. Software has a source code, written in programming language (e.g. Basic, Cobol, Pascal, C ++, Java, Python, etc.) and an object code or executable file (in machine or binary language). There are several kinds of software: firmware, which is software embedded in the machine (e.g. ROM, BIOS); operating systems (iOS, Android, Windows); and applications (Office, Antivirus, Browsers, Games). In broad sense, software also includes software algorithms and documentation (program description and instruction manual), as well as databases or broad-based information that it processes (so-called 'dataware').

In the field of robotics, software is the centre of operations or commands of the robot, and the degree of intelligence of the robot depends on the software it performs or executes. The robot is often designed according to the image and likeness of its human creator, both in physical appearance and in behaviour and communication. However, robots do not all look human-like. Compare, for - example, the Astro-mechanical droid R2-D2 with the C-3PO, the latter an android of protocol, with shapes closer to humans, and which is presented in the following terms: "I am C-3PO, cyborg of human relations and fluent in 6 million different languages and speeches."

These characters from George Lucas's epic fiction Star Wars are mechanical (as opposed to biological) beings endowed with intelligence. Intelligence will evolve not only in communicational and behavioural terms, but also physically, with the Hasbro Transformers, alien robots that are able to turn their bodies into other objects like motor vehicles. Many of these beings are not even human creations, instead they come from worlds yet undiscovered and may pose a threat to the survival of the human species...

This paper focus on robots generated by humans and increasingly provided with artificial intelligence (AI), although not necessarily in human form. AI is a branch of computer sciences that looks for computational methods or devices capable of emulating the rational capacity of the human being to solve problems, to think or, in general, to act intelligently. That is the case of IBM's Watson, with relevant applications in healthcare and the legal sector, as well as in water, energy or traffic management systems. There is even mention of Watson overcoming Google: it is able not only to search information in the web, but also to process it in terms similar to human thinking, and it can be used on a smartphone. Legal challenges posed by technological advances impact several fields of law, from civil law to labour law, as well as administrative and tax law.

The European Parliament has passed a resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics. In particular, it states "general principles concerning the development of robotics and artificial intelligence for civil use", notably a principle on intellectual property rights according to which "there are no legal provisions that specifically apply to robotics, but that existing legal regimes and doctrines can be readily applied to robotics, although some aspects appear to call for specific consideration; calls on the Commission to support a horizontal and technologically neutral approach to intellectual property applicable to the various sectors in which robotics could be employed".[3]

2. Legal protection of robotic software

This paper focus the legal protection of software executed by the robot, i.e., whether robotic software can and should be protected, and if so on what terms.

Robotic software, as a computer program, can be, and is, protected under intellectual property. The question has been raised more than half a century ago and it has been widely discussed, to the point that an author exclaimed about papers on the legal protection of software: "Not another one!"[4]

Some argued that software by its very nature should be protected as a technical invention by patent law, while others argued for the protection of computer programs under copyright law. A third way would be to assign a new *sui generis* protection to software, a mixture of patent and copyright. Finally, it was also possible to resort to the protection of trade secrets or technological know-how.

However, in 1973, the Munich Convention on the European Patent excluded the computer program as such from the subject matter of patents, and this exclusion was laid down in the domestic legislation of the contracting parties to that convention. In 1980, the US Copyright Act has been amended to grant copyright to computer programs.[5] In 1985, virtually all G7 countries adopted legislation in the same direction. In 1991 the European Community also

[3] European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics, para. 18 (2015/2103(INL)).

[4] DWORKIN, G., «Copyrights, Patents and/or 'Sui Generis': What Regime Best Suits Computer Programs», in: *International Intellectual Property Law and Policy* (ed. HANSEN, H), I, London, Sweet & Maxwell, 1996, p. 165.

[5] Cf. MILLER, Arthur, «Copyright protection for computer programs, databases, and computer-generated works: is anything new since CONTU?», *Harvard Law Review*, 106/5 (1993), p. 977-1073, 985 ss.

enshrined the copyright solution, as later did several international intellectual property instruments such as the 1994 TRIPS Agreement and the 1996 WIPO Treaties.[6]

3. Copyright in the Software

In Europe, the Council Directive 91/250 of 14 May 1991 (later replaced by Directive 2009/24/EC) has harmonized the legal protection of computer programs. It has been implemented in Portugal by Decree-Law No 252/94 of October 20, which has provided a kind of "anomalous" or "improper" copyright.

Instead of amending the Copyright (and Related Rights) Act, domestic legislation drew up a specific statute for software.[7] In short, computer programs which, in their form of expression - including their preliminary design material (e.g. diagrams) - have a creative character (i.e. when they constitute intellectual creations) are protected (DL 252/94, art. 1/2). However, copyright does not protect the principles or algorithms implemented in the program, nor its functionality, but only the way in which they are presented, namely in source code.

Copyright belongs in principle to its intellectual creator. However, it can be assigned to a third party by contract and the law assigns it to the principal, the employer or the company where software is created, respectively, for hire, by employees, or within a company as a collective work (DL 252/94 art. 3, Copyright Act, art. 19). The moral rights of the creator of computer programs appear reduced to the right of paternity as the right to claim the authorship of the program and identification in the work (DL 252/94, art. 9). The right to the integrity of the work is deleted from moral rights, as article 15 (2) of the Copyright Act is excluded from computer programs (DL 252/94, art. 3/5). Said Article of the Copyright Act reads that "The right to make changes to the work depends of the express agreement of its creator and can only be exercised under the terms agreed upon." However, the courts do not exclude the moral right to integrity of the work, so that employers or acquirers of the program are prevented from freely modifying it.

With regard to economic rights, a broad concept of reproduction, as confirmed by the courts, and the right to produce and sell copies are listed (subject to EU exhaustion). The duration of the copyright is governed by the general rule of 70 years *post mortem auctoris* or, where rights belong to a legal person (e.g.

[6] Further developments, PEREIRA, Alexandre Dias, *Informática, direito de autor e propriedade tecno-digital*, Coimbra Editora, 2001, VIEIRA, José Alberto, *A proteção jurídica do programa de computador pelo direito de autor*, Lex, Lisboa, 2005.

[7] Belgian has also adopted a specific Act, Law of 30 June 1994. Cf. STROWEL, Alain/ TRIAILLE, Jean Paul, *Le droit d'auteur, du logiciel au multimedia*, Bruxelles, Bruylant, 1997, p. 136 s.

a company), from its dissemination (Copyright Act, art. 36). In free use, comparing with copyright law in general, no freedom of reproduction is foreseen for private use of computer programs.

An innovative aspect of copyright that the directive introduced concerns the rights of the legitimate user (or license holder), who is provided with the rights to reproduce and to study the program in the context of its use, to make a backup copy, to reproduce and to modify the program for the purpose of correcting errors, including in our view reverse engineering strictly necessary for interoperability with independent program, and the use, for those purposes, of the information thus obtained. Users' rights are mandatory and do not detract from other means of software protection, namely patent law and protection of trade secrets (DL 252/94 arts. 6 and 7).

4. Patents for inventions related to computer programs

Is robotic software eligible for patent law protection?

The assignment of patents depends on the application fulfilling certain requirements. Patents concern technical inventions, i.e., works of the spirit on technical problems and that are not just mathematical or logical formulas. Technical inventions must be novel in the light of the state of the art and result from an inventive step, in the sense that they are not obvious. Finally, the invention must be susceptible of industrial application, i.e., capable of use in industry or agriculture.

The patent object does not cover all the works of the mind. Discoveries, scientific theories and mathematical methods, materials or substances already existing in nature and nuclear material, aesthetic creations, designs, principles and methods of engaging in intellectual activities in the field of games or in the field of economic activities, computer programs as such, without any contribution, and presentations of information, are not eligible for patents, unless the object for which the patent is applied is limited to the elements mentioned in it (Industrial Property Code, art. 52).

The provisions of the Munich Convention on the European Patent underpinning said internal system have not prevented the European Patent Office from granting patents to inventions relating to computer programs, in particular in the sector of medical devices. In the case of robots, reference is made to patent EP 1169092 B1 on a telescopic fire-fighting robot, controlled manually or remotely, and automatically connected to the water-channeling system and hung in a monorail in tunnels. According to the summary of the disclosure of the invention, the *fire-fighting robot* serves to extinguish fires in tunnels. It hangs in a carriage that runs on a monorail to the tunnel vault. An oil-dynamic tele-

scopic piston allows transport to be reduced to the road surface. This feature allows the robot to overcome any obstacle, protect people and transport people without traffic obstacles and fight the fire. To have a continuous extinguishing of fire, the robot is connected to the water conduit by a flexible tube with 30 meters with an automatic arm.[8]

In the USA, patents do not meet a standard similar to CPE. There are software patents, including robotic software. This is the case, for example, of patent US 8996429 B1: methods and systems for the development of the *robotic personality*. According to the patent summary, the patented technology consists of methods and systems of interaction of the robot with the user in order to generate a personality of the robot. The robot can access a user's device to determine or identify information about a user's identity and the robot can be configured to the user's measure with the identifiable information. The robot can find data associated with the user's identity through voice or facial recognition. The robot can provide a personalized interaction or response to the user based on the user's specified information. In some instances, the personality or personalization of a robot can be transferred from one robot to another (machine), and the information stored in one robot can be shared with another robot through the cloud.[9]

5. Patenting the brains of robots and robotic prostheses?

Should there be software patents on the logical component of the robot? The Free Software Foundation, created by Richard Stallman, launched the GNU GPL (General Public License) licenses ensuring the freedom to reproduce, modify, and/or distribute software. The use of free software developed by this community would be free, conditioned only to the duty to provide the license together with the software and to share the same freedom that is received. The idea is to prevent copyright and patents from impeding the free development of software, which is considered a language subject to the constitutional imperatives of free speech. In the EU, there is a European version of the GPL, the European Union Public License. Will patents deter the development of AI and the evolution of Robots? The rational of patents is the opposite: patents provide a stimulus to innovation by granting inventors with a temporary monopoly over a new product or process. So, the case may be that patents in robotic software contribute to the evolution of Artificial Intelligence.

[8] https://patents.google.com/patent/EP1169092B1/sv

[9] https://www.lens.org/lens/patent/US_8996429_B1

Another question is whether pieces of the robot that replicate parts of the human body can be patented. Article 54(c) of the Industrial Property Code provides that a new invention may be patented, where it involves an inventive step and is capable of industrial application, affecting any element isolated from the human body or otherwise produced by a technical process, including the sequence or partial sequence of a gene, even if the structure of that element is identical to that of a natural element, provided it is expressly observed and specifically set forth in the patent application, the industrial application of a sequence or a partial sequence of a gene. Therefore, robotic prostheses are arguably eligible for patent protection.

6. Trade Secrets

Robotic software can be protected as know-how or confidential business information. Article 318 of the Industrial Property Code protects trade-secrets or know-how as undisclosed information. It is a special form of unfair competition, i.e., acts of competition contrary to the honest standards and practices of any branch of economic *activity.* It is the disclosure, acquisition or use of business secrets of a competitor, without the consent of the competitor, where such information (1) is secret, in the meaning that it is not generally known or easily accessible in its entirety or in the exact configuration and connection of its constituent elements to persons in circles who normally deal with the type of information in question; (2) has commercial value because it is secret; (3) has been the subject of considerable diligence in the light of the circumstances of the person legally in control of the information to keep it secret.

In the European Union, the European Parliament and the Council have adopted Directive 2016/943 of 8 June 2016 on the protection of know-how and confidential business information (trade secrets). Protection is provided against the acquisition, use and disclosure of confidential business information, which is considered secret information in the sense that: (1) in its entirety or in the exact configuration and connection of its constituent elements, it is not generally known to those in circles who deal normally with the type of information in question, or is not easily accessible to such people; (2) with commercial value because it is secret; (3) and which has been the subject of reasonable action, in the light of the circumstances, to be kept secret by the person exercising his control by law.

7. Conclusion

Robotic software is an essential dimension of AI systems. This paper figured out several possibilities to protect robotic software under intellectual property law. The first way is copyright law, as computer programs are listed as eligible copyright subject-matter, yet with special rules. However, copyright is limited in scope and does not exhaust the legal protection of robotic software. In particular, the patent system may prove a relevant solution for robotic software to protect its functionality. Finally, regardless of copyright and/or patent law, trade-secret protection is also an important branch of legal protection for robotic software.

In any case, is it important to preserve freedom of innovation so that AI can be developed to the benefit of Mankind and Nature.

FIGHTING PLANNED OBSOLESCENCE OR 'THE LIGHTBULB CONSPIRACY' AS AN UNFAIR COMMERCIAL PRACTICE: FOR A CIRCULAR ECONOMY

R. Koolhoven/E. L. Heerema [1]

Abstract: The French environmental group Halte à l'Obsolescence Programmée (HOP) reported several producers of printers and Apple for deliberately shortening the lifespan of their products, for the first time enforcing the new legislation on 'planned obsolescence'. Deliberately shortening product lifespan is not only detrimental to the environment and the consumer who is being economically disadvantaged; it is also contrary to the commonly shared opinion that our current level of consumption and production are depleting the earth and its resources. On a European level, course is therefore set to shift from the linear model of production and consumption towards a sustainable, circular economy. The question we address in this article, is whether the Directive on Unfair Commercial Practices could provide for a legal basis to tackle planned obsolescence as an environmental and consumer issue.

Keywords: planned obsolescence, unfair commercial practices, circular economy

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economy 2.1 The Sustainable Development Goals 2.2 European initiatives 3. The Unfair Commercial Practices Directive 3.1 The UCPD in overview 3.2 The active, misleading information provision 3.3 The misleading omission a. Omission of information b. Another transactional decision? c. No prevention of the practice 3.4 The general clause of unfair commercial practice a. Professional diligence b. Material distortion of the economic behaviour of the average consumer c. Prevention? 4. Concluding remarks

Introduction

On the 27th of December 2017, the French Environmental group 'Halte à l'Obsolescence Programmée' (Stop Planned Obsolescence) filed a complaint against Apple for intentionally slowing down older iPhone models.[2] Earlier that year, it filed a case against printer producers Epson, HP, Brother and Canon, causing the French prosecutors to launch an investigation.[3] On January 5th 2018, the Parquet de Paris entrusted the Competition and Consumer Authorities (DGCCRF)[4] to start a preliminary inquiry on Apple as well, for deceit by means of 'obsolescence programmée' (planned obsolescence).[5]

Even though there have not yet been any fines imposed on producers, it is commonly believed and even proven in other cases that producers are using techniques to deliberately reduce the lifespan of their products.[6]

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[2] WHITE, Jeremy, Apple sued over slowing phones in France, independent.co.uk/life-style/gadgets-and-tech/apple-lawsuit-phones-slow-france-planned-obsolescence-legal-challenge-crime-a8132371.html#gallery, March 19, 2018.

[3] AGENCE FRANCE PRESSE, Apple, Epson face French legal pressure over planned obsolescence, news.abs-cbn.com/business/12/28/17/apple-epson-face-french-legal-pressure-over-planned-obsolescence, March 22, 2018.

[4] The 'Direction générale de la concurrence, de la consommation et de la répression des fraudes (DGCCRF)' is the authority entrusted with the enforcement of competition legislation, consumer affairs and fraud control. AGENCE FRANCE PRESSE, Apple visé en France par une enquête pour obsolescence programmée, france24.com/fr/20180108-france-apple-vise-enquete-obsolence-programmee-iphone-hop, March 19, 2018. HOP, Les fabricants d'imprimantes mis en cause par une plainte, halteobsolescence.org/les-fabricants-dimprimantes-mis-en-cause-par-une-plainte, March 19, 2018.

[5] The French term is 'tromperie': *un délit qui consiste à induire en erreur*. According to the IATE dictionary this is to be translated with 'deceit': intentionally giving a false impression, see IATE. europa.eu search 'tromperie'.

[6] Article L441-2 Code de la Consommation (France): 'Est interdite la pratique de l'obsolescence programmée qui se définit par le recours à des techniques par lesquelles le responsable de la mise sur le marché d'un produit vise à en réduire délibérément la durée de vie pour en augmenter le taux de remplacement'.

For a long time, it was argued that this practice is only detrimental to consumers to some extent because rapid product renewal stimulates innovation and was necessary to keep our economies flourish. Lately though, planned obsolescence and the E-waste deriving from it - started playing a big role in the public debate on climate-change. Global policymakers agree that we need to restructure production and consumption, because our linear production and consumption model is depleting the earth of its resources and creating too much waste.

France was the first European country to draft legislation to tackle 'planned obsolescence' as an environmental, societal and economic problem by imposing sanctions on fraudulent producers aside the European Unfair Commercial Practices legislation.[7] In this article, we will explore whether the European Directive on Unfair Commercial Practices (hereafter: UCPD) as such offers a European, legal basis for tackling planned obsolescence.[8] We will answer this question in light of the fact that the European Commission, European Parliament and European Economic and Social Committee (EESC) all announced the search for a way to ban planned obsolescence and head for sustainable consumption in a circular economy, whereas the UCPD provides for maximum harmonisation. We will conclude with advantages and disadvantages to the proposed solutions and emphasise that further research into the efficacy of numerous public and private law instruments in this field is necessary.

1. Planned obsolescence and the light bulb conspiracy

Obsolescence is in the nature of goods. Products become worn out and that is normal. However, there is a practice that producers adopt to make a consumer need something sooner than technically necessary. This causes many goods being thrown away even though they could still function properly.[9]

In 1932 the New York real estate agent Bernard LONDON wrote an article titled 'Ending the depression through planned obsolescence'. He explained that producers could speed up obsolescence to give the economy and labour market a boost. If a product is perceived as 'old' or does not function as good as a

[7] BERNE, Xavier, Une proposition de loi veut pénaliser l'obsolescence programmée, nextinpact.com/news/78504-une-proposition-loi-veut-penaliser-l-obsolescence-programmee.htm, March 20, 2018.

[8] Directive 2005/29/EC of the European Parliament and of the Council of 11 May 2005 concerning unfair business-to-consumer commercial practices in the internal market and amending Council Directive 84/450/EEC, Directives 97/7/EC, 98/27/EC and 2002/65/EC of the European Parliament and of the Council and Regulation (EC) No 2006/2004 of the European Parliament and of the Council ('Unfair Commercial Practices Directive'), 2005, OJEU 11.6.2005, L 149/22.

[9] RITZER, George & DEAN, Paul, *Globalization: A Basic Text*, 2nd edition, Chichester, John Wiley & Sons, 2015, p. 312-313.

newer model or wears down easily, consumers will buy more which in turn helps the economy flourish. The core strategy became to augment the volume of sales by planning obsolescence, whereas before that, in the 19th century, goods were built to last a lifetime or longer.[10]

In the '20s and '30s of the 20th century, parallel to LONDON's article, the mass production of light bulbs for commercial purposes started, which grew to become – rightly or wrongly - the first well-known example of 'planned obsolescence'. Allegedly, the leading producers came together as the *Phoebus cartel* to not only standardize light bulbs, but also to conspire about deliberately shortening the lifespan of the bulbs below their possible lifespan to maximize sales volumes - hence the name 'the light bulb conspiracy'. The so-called 'Centennial Light', a light bulb burning since 1901 in a Fire Department in Livermore California, is said to be the evidence for the conspiracy because it is a light bulb that dates from before the Phoebus cartel.

The Centennial Light became a symbol for planned obsolescence as a business model.[11]

1.1 Definition

Over the course of years, several definitions of the term 'planned obsolescence' have appeared, of which the core always is the shortening of the replacement cycle to generate long-term sales volumes.[12] According to BULOW, planned obsolescence is 'the production of goods with uneconomically short useful lifes so that customers will have to make repeat purchases'.[13] In his definition he incorporates the effect that design decisions have on customers, which is also a prerequisite in Article 5 UCPD which we turn to later. The lifespan is 'the ability of a product to perform its function at the anticipated performance level over a given period (number of cycles – uses – hours in use), under the expected

[10] SLADE, Giles, *Made to Break: Technology and Obsolescence in America*, 1st edition, Cambridge (MA), Harvard University Press, 2007, p. 72-73. LONDON, Bernard, *Ending the depression through planned obsolescence,* pamphlet online on commons.wikimedia.org/wiki/File:London_(1932)_Ending_the_depression_through_planned_obsolescence.pdf, May 9, 2018.

[11] WIERING, Frank, *Tegenlicht Lab: Einde van bezit*, VPRO, 2015, vpro.nl/programmas/tegenlicht/kijk/afleveringen/2015-2016/einde-van-bezit.html, May 9, 2018; KRAJEWSKI, Markus, The great lightbulb conspiracy, spectrum.ieee.org/tech-history/dawn-of-electronics/the-great-lightbulb-conspiracy, March 20, 2018.

[12] JONKER, Jan, STEGEMAN, Harry & FABER, Niels, *De circulaire economie - Denkbeelden, ontwikkelingen en business modellen*, Nijmegen, Whitepaper, 2016, p. 7.

[13] BULOW, Jeremy, «An Economic Theory of Planned Obsolescence», *The Quarterly Journal of Economics*, 101(4), 1986, p. 729–749.

conditions of use and under foreseeable actions'.[14] The appearance of planned obsolescence is not limited to the design or production phase. It can relate to maintenance and replacement as well. One can imagine that designing a product to discourage DIY repair or replacement of a component is a form of planned obsolescence. Not because the product is of inferior quality material, but because the buyer needs to make economic decisions repeatedly: to have the product repaired by an official dealer at a high price, to wait for a long time for a spare part or to buy a new product which is maybe only twice that price and is immediately available in another colour or style or 'newer' model.

The definition offered by the French *Code de la Consommation* (hereafter: CC) consists of the same three elements – (1) acting/designing (2) to shorten the lifespan of a product (3) to encourage repeat purchases – and adds a fourth element: (4) the lifespan should be shortened *deliberately*. There is a difference between designing a product with a shorter lifespan and deliberately shortening the lifespan to encourage repeat purchase. A short lifespan could be a matter of price and quality. A producer might bring two types of an alike product on the market; an expensive one consisting of higher quality materials and a cheaper one. The argument could be to make innovations accessible to the greater public. We will discuss this further in our legal analysis.

1.2 Types of obsolescence

SLADE defines three types of obsolescence in his book *Made to break*: technological, psychological and planned obsolescence.[15] Other distinctions are made as well and there is overlap.

Technological obsolescence is characterised by the invention of a technically advanced product that makes the previous model obsolete. An example SLADE gives is the electric starter motor for cars. When the electric starter motor was invented, all cars that had to be hand cranked became 'old'. Under technological obsolescence, also 'systemic obsolescence' is ranged: if the system in which a product is used is altered in such a way that its continued use becomes difficult. For example introducing non-compatible software updates or updates which are more voluminous and require more memory (such as 'eye candy' – more pixels) so that older computers are unable to process them.[16] Perfectly

[14] BOULOS, Stéphanie et al., *The Durability of Products: Full Report*, DOI 10.2779/37050, p. 7.

[15] SLADE, Giles, *Made to break: technology and obsolescence in America*, 1st edition, Cambridge (MA), Harvard University Press, 2007, p. 3-4.

[16] MIAO, Chun-Hui, «Planned obsolescence and monopoly undersupply», *Information Economics and Policy*, 23(1), 2011, p. 51–58, explaining that making a new generation of technically incompatible products - like game consoles - is a form of planned obsolescence.

functioning computers are rendered technically or systemically obsolete by the fact that the newer versions demand too high performances. An example can be found in the microprocessors for personal computers, whose highly obsolete market is dominated by two global producers Intel and AMD. It is argued that the systemic innovations are put on the market gradually to force consumers to regularly update their equipment.[17] If two dominant players in the field gradually introduce novities to the market, they are sure that consumers are forced to repeat purchases.[18]

A problem that goes hand in hand with technological obsolescence is the fact that the current design of laptops and mobiles, that always need to be thinner and lighter, complicates the possibility of repairing or updating hardware components. Apple for example has soldered their RAM to the motherboard of its computers. If a new software version demands more of the hardware, it is impossible to upgrade the hardware, thus rendering a functioning device obsolete faster than when its parts would have been replaceable. A comparable practice is to use a non-standard format of hard drives on computers.

The French organization ADEME - involved in environmental research and advocacy for tackling planned obsolescence, calls technological or systemic obsolescence '*obsolescence fonctionnelle*': 'a product does not respond anymore to the new expected use for technological reasons (incompatibility with new equipment) or rules'.[19]

The second type of obsolescence defined by SLADE is 'psychological obsolescence'. This is in a narrow sense a marketing strategy, consisting of introducing a different 'fashion', a different colour or slightly changed style. SLADE describes General Motors' cars as an example, because it introduced differently coloured cars which competitors did not do.[20] Henry T. FORD opposed: *'Any customer can have a car painted any color that he wants so long as it is black.'* Coloured cars became fashionable status symbols and with that development, General Motors found a strategy to shorten the replacement cycle of its cars and to gain an edge on its competitors.[21] Another strategy is not to change the colour,

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[17] LEE, Dave, The problem with forced tech obsolescence, bbc.com/news/technology-35984185, March 21, 2018.

[18] GOTTINGER, Hans-Werner, *Economies of Network Industries*, 1st edition, London/New York, Routledge, 2003, p. 176-177.

[19] ADEME, Étude sur la durée de vie des équipements électriques et électroniques, 2012, p. 15, ademe.typepad.fr/files/dur%C3%A9e-de-vie-des-eee.pdf, March 21, 2018.

[20] SLADE, Giles, *Made to break: technology and obsolescence in America*, 1st edition, Cambridge (MA), Harvard University Press, 2007, p. 36, 49-50.

[21] SCHAUB, Coralie, La vie gâchée des objets, liberation.fr/futurs/2012/10/28/la-vie-gachee-des-objets_856572, March 22, 2018.

but to add an extra function to 'model 3', calling it 'super-3' or '3i', which makes the previous model appear old.

ADEME would categorise this under 'obsolescence d'évolution' corresponding to the fact that a product does not respond to the wishes of the consumer anymore because they want a newer model for other functionalities or design.[22] In this description technological obsolescence overlaps with psychological obsolescence: producers that release technically updated products might persuade consumers that are vulnerable to status, to buy the technically newer or better product, whereas the 'old' product still functions properly.

Thirdly, SLADE describes the term 'planned obsolescence' as a catchall phrase to describe the assortment of techniques used to artificially limit the durability of a manufactured good in order to stimulate repetitive consumption.[23] Producers plan the lifespan of a product shorter than technically necessary to prevent the market from becoming saturated. Planning the lifetime of a product is done already during the design phase of a product. The process also referred to as 'contrived durability' is about designing a product to deteriorate quickly for cost or weight saving reasons. Using inferior material, soft metal, cheap plastic in stress-bearing components will decrease the lifespan of a product. If this is done, this will not in itself be an example of a planned obsolescence strategy with the producers' purpose to self-enrichment, because a producer has the freedom to set the durability level of a product and offer a cheaper model. Even though making decisions to create cheap and single-use products or disposables is not a crime detrimental to consumers, it is detrimental to the environment. According to the Belgian Senate 'planned obsolescence' is the design of a product, planning the expiration-date.[24] A way to plan the expiration-date and influence the lifetime of a product is not only to choose inferior materials, but also to make repair more difficult.[25] FORESMAN wrote how Apple 'screwed the iPhone out

[22] ADEME, Étude sur la durée de vie des équipements électriques et électroniques, 2012, p. 15, ademe.typepad.fr/files/dur%C3%A9e-de-vie-des-eee.pdf, March 22, 2018.

[23] SLADE, Giles, *Made to break: technology and obsolescence in America*, 1st edition, Cambridge (MA), Harvard University Press, 2007, p. 5.

[24] Belgian Senate, *Proposition de résolution en vue de lutter contre l'obsolescence programmée des produits liés à l'*énergie 2011, senate.be (search by File Number 5-1251/1), March 22, 2018.

[25] KINOKUNI, Hiroshi, «'Planned antiobsolescence' occurs when consumers engage in maintenance», International Journal of Industrial Organisation, Vol. 28, 2010, p. 441–450. For obvious reasons Kinokuni considers repairing products to augment their lifespan a form of 'planned anti-obsolescence'.

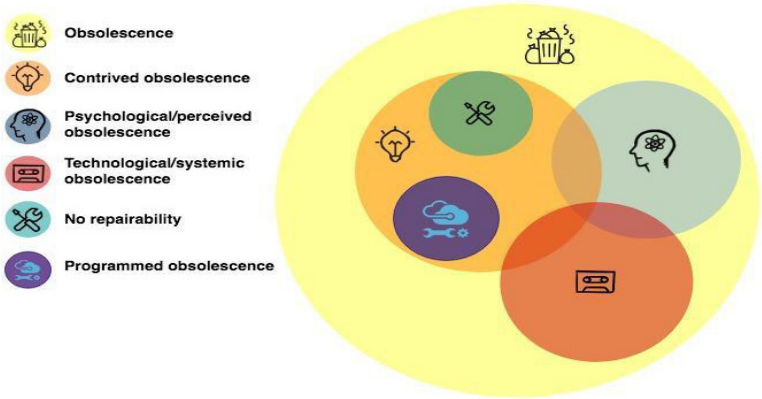
of DIY repair'.[26] DIY repair is an important, yet simple way to save resources and prevent waste.

Within the notion of planned obsolescence, some authors distinguish the term 'programmed' obsolescence. It is planned obsolescence in the sense that producers disable a product deliberately to prevent it from working to incite repeated purchases by customers. 'Programmed' obsolescence refers to the employment of chips (one specific technique) in cartridges that make it impossible to use the printer after a certain number of prints or duration of time.[27] Apparently, when printers warn the user that the cartridge is empty, 50 percent of the toner cartridge is often still full. In the United States Hewlett Packard (HP) was involved in three putative class-action lawsuits (*Ciolino* v. HP, *Rich* v. HP, and *Blennis* v. HP), which were consolidated into one suit (In re: HP Inkjet Printer Litigation) for unfair business practices relating to its inkjet printers' use of ink cartridges. The parties agreed to a global settlement, in which HP promised to discontinue the use of unnecessary replacement messages and compensate the consumers in the class action for $5,000,000 for future purchases from Hewlett Packard.[28]

[26] FORESMAN, Chris, Apple 'screwing' new iPhones out of simple DIY repair, online: arstechnica.com/gadgets/2011/01/apple-screwing-new-iphones-out-of-simple-diy-repair/ (last visited March 22, 2018).

[27] WRBKA, Stevan, «Warranty Law in cases of planned obsolescence – The Austrian situation», *Journal of European Consumer and Market Law*, 2017(2), p. 67-76 describes a distinction of 'obsolescence of function, desirability and quality'.

[28] POWER, James, «Tearing Down a House of Coupons: CAFA's Effect on Class Action Settlements», *University of St. Thomas Law Journal*, Vol. 9, Issue 3 (2012), p. 906-932; In re HP Inkjet Printer Litig., No. 5:05-cv-3580, 2011 WL 1158635, at *5 (N.D. Cal. Mar. 29, 2011); JDSUPRA, In re: HP Inkjet Printer Litigation: Ninth Circuit Reverses And Remands Hewlett-Packard Coupon Settlement, online: jdsupra.com/legalnews/in-re-hp-inkjet-printer-litigation-nin-77516/ (last visited March 22, 2018).



In (legal) literature, there is no clear distinction or division of types of obsolescence into criminal or fraudulent planned obsolescence and 'acceptable' contrived durability.[29] The figure we incorporate, only offers our understanding of different types of obsolescence and their overlap. Because there are no data on how often, in what sector, nor in which way 'obsolescence' is deliberately practiced, the illustration does not represent a scale either.

1.3 The French prohibition of 'planned obsolescence'

In the last decade, the problem of planned obsolescence - called 'obsolescence programmée' - received a lot of attention in France. In 2010, there was the broadcast of a documentary on the French television channel Arte, *Prêt à jeter,* which means 'Ready to throw away'.[30]

Then, planned obsolescence received political attention; Eva Joly, candidate during the presidential campaign of 2012 of *Europe Ecologie*, proposed to ban the practice of planned obsolescence.[31] The group Europe Ecologie-Les Verts offered draft legislation, which was debated in parliament in March 2013 as part

[29] WRBKA, Stefan, «Warranty Law in Cases of Planned Obsolescence - The Austrian Situation», *Journal of European Consumer and Market Law*, 2017(2), p. 67-76.

[30] DANNORITZER, Cosima (prod.), *Prêt à jeter*, ARTE, 2010, online: arte.tv/fr/videos/042441-000-A/pret-a-jeter (last visited March 26, 2018).

[31] VIGNAL, François, Eva Joly veut interdire 'l'obsolescence programmée', publicsenat.fr/lcp/politique/eva-joly-veut-interdire-l-obsolescence-programmee-197806, March 22, 2018.

of the 'consumer' bill of rights.[32] It was suggested to prolong product conformity, facilitate access to spare parts needed for repair for ten years, and to make planned obsolescence strategies punishable by two years imprisonment and a fine of € 37,500. Article 8 of Loi no. 2014-344 of 17 March 2014 on consumption then provided that 'within one year of the promulgation of this law, the Government shall submit to Parliament a report on planned obsolescence, its legal definition and its economic questions'.[33]

Almost six months after the deadline, no report was submitted even though the battle against planned obsolescence was one of the key goals of the ecological transition desired by the President of the Republic. After a question from the Senate, the Ministry of Environment Energy and the Sea, responsible for international climate relations, answered in September 2016 that planned obsolescence still is a priority in the transition to the circular economy, but more time was necessary to finish the report, to be able take into account the Law on Energy Transition for Green Growth.[34] Article 99 of that law made planned obsolescence an offence, sanctioned by maximum two years imprisonment and a fine of € 300,000 for an individual, and 5% of the annual turnover for a contravening company.

Article 99 was inserted into the French Code de la Consommation as the new Article L441-2, which defines forbidden planned obsolescence as 'the practice defined by the use of techniques by which the person responsible for putting the product on the market aims to deliberately reduce the lifetime of a product with the purpose of increasing the amount of replacements'.[35] This addition to the Code de la Consommation was part of a greater operation, in which the presumption of non-conformity was extended as well to 24 months (article L. 217-7

[32] FRANCEINFO & AGENCE FRANCE PRESSE, Que dit la proposition de loi contre l'obsolescence programmée?, francetvinfo.fr/politique/que-dit-la-proposition-de-loi-contre-l-obsolescence-programmee_309719.html, March 22, 2018; SENET, Stéphanie, Une loi pour lutter contre l'obsolescence programmée?, journaldelenvironnement.net, March 22, 2018.

[33] LOI n° 2014-344 du 17 mars 2014 relative à la consommation, Article 8.

[34] MINISTRY OF ENVIRONMENT, ENERGY AND THE SEA, senat.fr/questions/base/2015/qSEQ151018275.html; LOI n° 2015-992 du 17 août 2015 relative à la transition énergétique pour la croissance verte, Article 99, legifrance.gouv.fr/eli/loi/2015/8/17/2015-992/jo/article_99.

[35] The original wording of Article L-441-2 Code de la Consommation is: 'Est interdite la pratique de l'obsolescence programmée qui se définit par le recours à des techniques par lesquelles le responsable de la mise sur le marché d'un produit vise à en réduire délibérément la durée de vie pour en augmenter le taux de remplacement'.

Code de la Consommation).[36] Consumers also obtained improved information rights, like the right to know for how long spare-parts will be available, and the right to receive these parts within two months (article L. 111-4 Code de la Consommation)[37], with the purpose to support sustainability and reparability. One question one can debate about is how this article can exist next to the UCPD, because the character of the UCPD is maximum harmonization, so that Member States are no longer free to regulate or prohibit such practices.[38] The European Commission in its guidance of 2016 enshrined that the UCPD does not affect national rules intended to protect interests not of an economic nature; Member States can set more stringent rules to regulate commercial practices in case of the protection of health, safety and the environment.[39] The environment can therefore be considered as one of the exceptions to the harmonisation system that lead to differences between countries. We are of the opinion that the French article was a necessity as well, for the purpose of legal certainty (lex certa and lex scripta), given the fact that also criminal prosecution - and not only civil consumer law enforcement - is aimed for.

1.4 Elements

The French legislator chose to further elaborate four elements in Article L441-2 to battle planned obsolescence: 'le recours à des techniques', 'réduire la durée de vie', délibérément', 'pour en augmenter le taux de remplacement'. One may assume that the use of techniques to shorten the lifespan can be ranged under technological or psychological obsolescence as well; it may have as a result

[36] Article L217-7: 'Les défauts de conformité qui apparaissent dans un délai de vingt-quatre mois à partir de la délivrance du bien sont présumés exister au moment de la délivrance, sauf preuve contraire. Pour les biens vendus d'occasion, ce délai est fixé à six mois. Le vendeur peut combattre cette présomption si celle-ci n'est pas compatible avec la nature du bien ou le défaut de conformité invoqué'.

[37] Article L111-4: 'Le fabricant ou l'importateur de biens meubles informe le vendeur professionnel de la période pendant laquelle ou de la date jusqu'à laquelle les pièces détachées indispensables à l'utilisation des biens sont disponibles sur le marché. Cette information est délivrée obligatoirement au consommateur par le vendeur de manière lisible avant la conclusion du contrat et confirmée par écrit lors de l'achat du bien. Dès lors qu'il a indiqué la période ou la date mentionnées au premier alinéa, le fabricant ou l'importateur fournit obligatoirement, dans un délai de deux mois, aux vendeurs professionnels ou aux réparateurs, agréés ou non, qui le demandent les pièces détachées indispensables à l'utilisation des biens vendus. Les modalités d'application du présent article sont précisées par décret.'

[38] BECKERS, Anna, «The regulation of market communication and market behaviour: Corporate social responsibility and the Directives on Unfair Commercial Practices and Unfair Contract Terms», *Common Market Law Review*, 2, 2017, p. 475–515.

[39] EUROPEAN COMMISSION, Guidance on the implementation/application of Directive 2005/29/EC on Unfair Commercial Practices, COM(2016) 320 final, p. 8.

that an older model is not popular anymore or does not look good anymore or functions slightly slower which could be annoying. However, to act within the realm of Article L-441-2 the subjective or psychological element is not key. The goal of the definition on L441-2 is '[…] to limit the term 'planned obsolescence' to (a) *objective technical reasons* and to exclude the subjective dimension linked to a consumer's own choices.[40] The techniques that could be used to reduce the lifespan are the introduction of a flaw, a weakness, a scheduled stop, a technical limitation, incompatibility, insufficient memory to cope with updates or other obstacles for repair. A common example is software for which the publisher ends support after a certain date, forcing users to purchase a newer version that they do not necessarily need and that is not compatible with the user's hardware and causes the obsolescence of the hardware.

In time, all products show signs of wear. Therefore, not all decrease of value or performance by technique can be seen as a crime or unfair practice. Only (b) *actively* restricting the lifespan by saving on durability without any technical reason to do so, is seen as 'obsolescence programmée'. The act should furthermore be (c) *deliberate* and have the purpose to (d) *increase the sales volume*. As we have seen how certain techniques can have different effects, it will be difficult to draw a line between affordable product design and planned obsolescence. In addition, the legislator acknowledges it is a phenomenon which is hard to characterise.[41]

1.5 Enforcement

The Code de la Consommation (Article L454-6) punishes planned obsolescence with imprisonment and a fine of 300,000 euros. The fine may be increased, in proportion to the benefits derived from the offense, up to 5% of the annual average turnover, calculated based on the last three annual turnovers known at the date of the facts. Natural persons may be prohibited - see Article 131-27 of the Penal Code - to exercise certain public functions or exercise certain social activities related to the offense.

It will be up to the individual consumer who wishes to sue a producer for fraud to provide proof of the use of a planned obsolescence technique. It is however proven to be difficult for the consumer to prove that the producer acted deliberately with the objective to maintain a market for his own products and to

[40] ADEME, Étude sur la durée de vie des équipements électriques et électroniques, 2012, p. 15, ademe.typepad.fr/files/dur%C3%A9e-de-vie-des-eee.pdf, March 22, 2018.

[41] GOUVERNEMENT FRANÇAISE, *Rapport du Gouvernement au Parlement sur l'obsolescence programmée, sa définition juridique et ses enjeux économiques*, p. 9, ecologique-solidaire.gouv.fr/sites/default/files/RAPPORT_Obsolescence_programmee.pdf, March 26, 2018.

create a necessity for replacement or renewal. It is discussed that this difficulty is the reason that in the two years after the entering into force of the new legislation, no consumer has yet challenged a producer.[42] Other problems rise as well. Companies are often based abroad and able to invoke business secrecy or the protection of their patents.[43] Enforcing these rules requires technical research and many expenses, which explains that the consumer is bound to turn to a consumer organisation (such as the aforementioned HOP) to start a class action.

2. Towards a circular economy

2.1 The Sustainable Development Goals

In September 2015 during a United Nations Summit, the '2030 Agenda for Sustainable Development' was adopted as a resolution by the UN. This resolution is regarded as the follow-up on the Millennium Goals, which were in effect until 2015. Seventeen goals were implemented, amongst them tackling poverty, inequality and climate change and pursuing a sustainable way of consumption and production. These SDG's are not legally binding to any of the countries that have ratified the resolution, but they do put political and ethical pressure on the partaking countries.[44] In particular, there is the issue of the export of waste to the low-income countries. The waste that is exported to poorer countries to dispose of it or to store it, leads to drinking water pollution and environmental problems in those countries.[45] It is however, partly the result of our current high level of consumption and disposal. This trend morally forces consumers in first-world countries to change their consumptive behaviour and at the same time, forces producers to change their methods. The initiatives we see on European and national levels align with these Sustainable Development Goals, but try to translate them into more concrete policy measures and (future) legislation.

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[42] MARTIN, Marie & ROTA, Daniel, Obsolescence programmée: le Parquet de Paris ouvre une seconde enquête, fidal-avocats-leblog.com/2018/02/obsolescence-programmee-parquet-paris--ouvre-seconde-enquete, March 26, 2018.

[43] DELAPIERRE, Michel, La loi sur l'obsolescence programmée ne panique pas l'industrie, tendances.info/2015/03/02/la-loi-sur-lobsolescence-programmee-ne-panique-pas-lindustrie, March 26, 2018.

[44] UNITED NATIONS, Sustainable Development Goals, un.org/sustainabledevelopment/development-agenda, March 26, 2018.

[45] AHMED, Syez Farad, The Global Cost of Electronic Waste, theatlantic.com/technology/archive/2016/09/the-global-cost-of-electronic-waste/502019, March 26, 2018; UNEP, *Waste crime - waste risks, Gaps in meeting the global waste challenge*, 2015, europa.eu/capacity4dev/file/25575/download?token=WAWKTk7p, March 26, 2018.

2.2 European initiatives

In 2002, the Council and European Parliament adopted the Directive on Waste Electrical and Electronic Equipment (WEEE Directive) which obliged Member States to establish a system for the collection of e-waste. Reuse, recovery, recycling, and correct disposal of the remaining waste should be provided for by August 2005. This Directive made the collection, re-use and recycling targets part of the producer's obligations. At the same time the Directive on the Restriction of the Use of Hazardous Substances (RoHS) was adopted to ban hazardous substances from electronic equipment to facilitate recycling and to reduce emissions when the remaining e-waste is landfilled or incinerated.[46] These rules were said to be the first initiatives to fight printer producers that used counter chips, blocking printing beyond a programmed number of sheets.[47] Some ink cartridges were equipped with a chip counting the number of prints, indicating a false ink level in the printing software, which leads to the disposal of cartridges that still contain ink.

In recent years, obsolescence and product quality gained more attention in the journey towards a circular economy. In 2013, the European Economic and Social Committee voted on an opinion by Thierry LIBAERT and Jean-Pierre HABER against planned obsolescence.[48] In the years thereafter, the 'Ecodesign Working Plan' emerged. In 2017, the European Economic and Social Committee evaluated the Ecodesign Working Plan in the light of the Circular Economy Action Plan.[49] It concluded that the Ecodesign Working Plan is too limited to be a strong driver for wholesale change in behaviour through the supply chains of goods and services. The focus should be on the full lifecycle of products, including their durability, ease of maintenance and repair, potential for sharing

[46] Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment, as amended by Directive 2003/108/EC, Directive 2003/108/EC of the European Parliament and of the Council of 8 December 2003 amending Directive 2002/96/EC on waste electrical and electronic equipment (WEEE) and Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

[47] CLOVER, Charles, Printer giants fight EU move to ban 'clever chip', telegraph.co.uk/news/worldnews/northamerica/usa/1390150/Printer-giants-fight-EU-move-to-ban-clever-chip.html, March 26, 2018.

[48] LIBAERT, Thierry & HABER, Jean-Pierre, Opinion of the European Economic and Social Committee on 'Towards more sustainable consumption: industrial product lifetimes and restoring trust through consumer information' (own-initiative opinion), 2014/C 67/05, OJEU 6.3.1024, C 67/23, eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013IE1904&from=en, March 26, 2018.

[49] EUROPEAN ECONOMIC AND SOCIAL COMMITTEE, «Opinion of the European Economic and Social Committee on the 'Communication from the Commission Ecodesign Working Plan 2016-2019'», OJEU 13.10.2017, C 345/97 (COM(2016) 773 final).

and digitisation, reuse, upgradeability, recyclability and actual uptake after use in the form of secondary materials in products entering the market. The ESSC advised to incorporate the principles of the circular economy in the context of digitisation, sharing and the functional economy, in order to have consistency across the various strategies that are intended to deliver a new economic model. Furthermore, component parts of a product should be easily recoverable for re-use and/or remanufacture and drive the creation of a strong secondary market for raw materials. It also noted that labelling requirements about life expectancy - as were also suggested by the French ADEME - can drive improved eco-design strategies and help consumers in decision-making, thus becoming a driver for behavioural change.[50]

The question that rises from these visions, for example the point that consumers should be informed about the lifespan of products, is whether not informing consumers about the influence that the producers took over the products expiry date should already been seen as a misleading omission as mentioned in Article 7 of the Unfair Commercial Practices Directive? Alternatively, if a more commonly shared opinion is that these practices of planned obsolescence are unfair behaviour of a producer vis-a-vis the consumer, the problem could be addressed as an unfair market practice in the sense of Article 5 UCPD? In essence, the French legislator also found planned obsolescence tortious, fraudulent behaviour. Is the existing legal framework of the UCPD not sufficient?

3. The Unfair Commercial Practices Directive

The Unfair Commercial Practices Directive was adopted by the European parliament on May 11, 2005 and needed implementation by the Member States before June 12, 2007. The aim of the directive is to create a level playing field of competition between producers within the internal market of the Union. Recital 8 of the UCPD mentions that the UCPD's side effect is that it will protect the interests of producers already adhering to the rules. The other aim is to protect consumer's economic interests by restraining producers in the practices they utilise in their course of business. The consumer should not be persuaded to make economic (purchase) decisions for the wrong reasons. Overall, these measures lead to increased consumer faith in the market.

Article 3 of the UCPD defines the scope of applicability: the directive applies to all unfair commercial practices, which take place before or during a business-to-consumer transaction. The directive faces the difficult task of

[50] About the information model: STRAETMANS, Gert, «Misleading practices, the consumer information model and consumer protection», *Journal of European Consumer and Market Law,* 5, 2016, p. 199-211.

discerning between actual unfair commercial practices and common market practices as Recital 6 exempts common market practices such as 'product placement' and 'brand differentiation' from the scope of 'unfair practices'. Within the realm of planned obsolescence, the Apple-example proves to be a good example of this difficult distinction: under what circumstances does the use of a technique (slowing down the operating system of a phone) prevent a product from being damaged and under what circumstances is that same technique seen as an unfair commercial practice because it persuades consumers to make a purchase decision?

3.1 The UCPD in overview

The directive can be divided into three standards that tackle unfair practices: 1. a general clause of unfair commercial practice; 2. a more specific clause of misleading or aggressive practices; 3. a blacklist of practices that are to be regarded as unfair practices under any circumstance.

When assessing a practice within the realm of the UCPD, there is a specific order to adhere to which is mostly due to practical reasons. The most efficient thread to follow is to first search for the practice on the blacklist of aggressive commercial practices mentioned in annex 1 of the UCP. Article 5 sub 5 UCPD writes 'Annex I contains the list of those commercial practices which shall in all circumstances be regarded as unfair. The same single list shall apply in all Member States and may only be modified by revision of this Directive.' There is a large variety of aggressive practices, such as displaying a quality mark without having the authorisation to do so, or creating the impression that the consumer cannot leave the premises until a contract is formed. An analysis of the blacklist shows that the practice of using a technique to shorten the lifespan of a product is not mentioned. Therefore, there is the need to assess whether it is an unfair commercial practice within the general clause or within the misleading and aggressive practices.

The second question one should address is whether the practice is aggressive or misleading in the sense of Article 6 to 9 of the UCPD. Article 8 - further explained in Article 9 - mentions a.o. the use of harassment, coercion, physical force and undue influence. This Article is related to the context in which a contract was concluded and therefore does not focus on the practice of research and development or design which took place before the product was sold. We can therefore conclude that Article 8 and 9 cannot be applied to qualify and tackle planned obsolescence as an unfair commercial practice.

Article 6 and 7 address the misleading of consumers, either by actions (6) or omissions (7). Taking into consideration that planned obsolescence is to be discerned from normal wear-and-tear by active manipulation, the first self-evi-

dent question is whether the use of a lifespan shortening technique is seen as a misleading action. If we take into account that the consumer is usually not informed about the use of lifespan shortening techniques, the second self-evident question is: 'Is not informing the consumer about the use of a lifespan shortening technique to be regarded as an unfair practice - e.g. a misleading omission - as in Article 7 of the UCPD?'

3.2 The active, misleading information provision

A commercial practice shall be regarded as misleading under Article 6 UCPD if it contains false information and is therefore untruthful or even likely to deceive the average consumer. The deception is seen in relation to several elements under which: the composition of the product and the need for a service, part, replacement or repair.[51] The provision of information about these elements should either cause or be likely to cause the average consumer to make a transactional decision that he would not have made otherwise.

The first question is under which element one could range the use of lifespan shortening techniques. In the example cases we mentioned, printer manufacturers and Apple used chips and software updates to shorten the lifespan, which are related to the composition of the products. Also, these techniques influence the need for services, parts, replacement or repair.

Furthermore, the provision of the information should be actively misleading. This requires the producers to have informed the consumer about the composition of the product and the (lack of) need for services, parts or repair in a more 'positive' way than the shortened lifespan justifies. It seems to us, that the required active deceit of the producer, lies more in the nature of the information provided, than in the use of lifespan shortening techniques. This becomes even clearer when one takes into account the wording of Article 7, about not-mentioning information concerning the composition or need for services, parts or replacement. This shows that the practice of planned obsolescence is not covered by the active misleading practice of Article 6, as this requires an active deed in the sphere of information provision.[52] This Article only comes into consideration when Apple would for example promote its iPhone with slogans and commercials expressing the thought that iPhones are made to last a lifetime. It would

[51] There is a clear relation between unfair commercial practices and pricing: DUIVENVOORDE, Bram, «The CJEU decision in Citroën/ZLW: Ready for REFIT?», *Journal of European Consumer and Market Law,* 2, 2017, p. 77-79.

[52] STRAETMANS, Gert, «Misleading practices, the consumer information model and consumer protection», *Journal of European Consumer and Market Law,* 5, 2016, p. 199-211.

come into consideration if the printer manufacturers would advertise about their printers as the most sustainable, long-lasting printers, for example.

3.3 The misleading omission

The Article which seems likely to tackle the use of lifespan shortening techniques as a consumer problem in an indirect way, seems Article 7 of the UCPD: *'A commercial practice shall be regarded as misleading if, in its factual context, taking account of all its features and circumstances and the limitations of the communication medium, it omits material information that the average consumer needs, according to the context, to take an informed transactional decision and thereby causes or is likely to cause the average consumer to take a transactional decision that he would not have taken otherwise.'*

a) Omission of information

As noted under 3.2 both Article 6 and 7 cover not the use of the lifespan shortening technique, but the way the producer deals with informing the consumer about it. Whereas the provision of information should be actively misleading under Article 6, Article 7 explicitly addresses the situation in which producers do not inform the consumer about the composition of the product and the need for services, parts, replacement or repair. The required omission - again - lies more in the nature of the information provided, than in the use of lifespan shortening techniques as such. This Article does come into consideration when Apple would actually use software updates to slow down the use of the iPhone without informing the consumer.

Other than Article 6, Article 7 does not elaborate on the elements that the misleading information can be about. It does not mention the composition or nature, or benefits of the product, or the need for services, parts, replacement or repair. It only refers to 'material information'. In paragraph 4 it is written what material information is *in the case of an invitation to purchase*, in short summarised: the main characteristics of the product, to an extent appropriate to the medium and the product; the identity of the trader, the price, freight, delivery charges, arrangements for payment, delivery, performance, the existence of a right of cancellation etc.. However, the UCPD does not give a precise definition of material information which is to be given about the product for example in the later stage of the decision-making process. In paragraph 1 of Article 7, one reads that material information is the information that the average consumer needs, according to the context, to take an informed transactional decision.

This leads to the difficult question whether a consumer would have decided otherwise, if he/she would have been informed about the lifespan shortening techniques.[53]

b) Another transactional decision?

How to assess whether the omission about the use of a lifespan shortening technique causes or is likely to cause the average consumer to take a transactional decision that he would not have taken otherwise? The transactional decision of an average consumer is based on numerous factors, such as the price, nature of the product, reputation of the producer and so forth. Whether omitted information about planned obsolescence influences the transactional decision may differ from one case to another.[54] To answer the question, it is interesting to understand the reasoning in the case in which Volkswagen was fined for unfair commercial practices. When Volkswagen was caught using software that altered the settings of car-engines in testing environments to meet environmental standards, the Dutch Consumer and Market Authority accused the company of using unfair commercial practices because the consumers would have taken other transactional decisions if they would have known about the practices. Volkswagen argued that less than 2% of consumers would make transactional decisions solely based on the environmental impact their vehicle would make.[55] The Dutch Consumer and Market Authority reasoned that even when environmental impact is not a leading cause for consumers to make transactional decisions; it still plays

[53] It is easier if the 'material information' as in Article 7(5) is required based on Community law. Information requirements established by Community law in relation to commercial communication are found in sector-specific EU legislation, as the Energy Labelling Directive (Directive 2010/30/EU), the Eco-design Directive (Directive 2009/125/EC) or the Fuel economy Directive (Directive 1999/94/EC). Such information requirements are more specific than the information requirements of the UCPD.

[54] The term average consumer, even though the European Court of Justice has defined it as 'the reasonably informed, reasonably observant, circumspect consumer' (Directive 2005/29/EC, recital 18), still remains a very complicated subject. This is demonstrated in the lengthy PhD-thesis of DUIVENVOORDE: DUIVENVOORDE, Bram, *The Consumer Benchmarks in the Unfair Commercial Practices Directive*, diss., Amsterdam, Springer International Publishing, 2014. We will not go into detail on this term as it would pass the purpose of this article, besides this we are also convinced that this term should be carefully assessed with each individual case.

[55] HAFNER, Rebecca, WALKER, Ian & VERPLANKEN, Bas, «Image, not environmentalism: A qualitative exploration of factors influencing vehicle purchasing decisions», *Transportation Research Part A: Policy and Practice*, 97, 2017, p. 89-105.

a role in the process of transactional decision-making.[56] In other words, if information about the environmental damage caused by vehicles has the capacity to influence a consumer, this information should be regarded as material information. The difference we acknowledge though is that based on Directive 1999/94/EC relating to the availability of consumer information on fuel economy and CO2 emissions in respect of the marketing of new passenger cars requires the display of a fuel economy label next to all new passenger cars at the point of sale containing, in particular, the official data on fuel consumption. This is an example of information that is material based on Community law. By analogy of the reasoning though, the information about the use of techniques to shorten the lifespan of a product has the capacity to influence the decision making of a consumer - he might expect more, given the price, or he might want to search for a comparable product which is more expensive but lasts longer - this information should be regarded as material information as in Article 7 of the UCPD.[57]

Even though WRBKA makes short mention of it, he seems to support this viewpoint. When the Commission[58] regards the failure to mention the deliberate shortening of the lifespan of a product as an unfair commercial practice, he specifies that this practice is to be regarded as a misleading omission as in Article 7 of the UCPD.[59] It is however clear why one of the initiatives discussed on both the French and European level is the introduction of a specific labelling requirement: an information obligation will lead to the legal fact that an omission is the omission of material information. It will take away all doubt regarding this question.

c) No prevention of the practice

This route, we find it important to distinguish, will not primarily prevent the use of lifespan shortening techniques in consumer goods. It will force producers to make consumers aware of the techniques that have been used, but does

[56] CONSUMER AND MARKET AUTHORITY (ACM), Decision on Volkswagen (AG), ACM/17/003870, October 18, 2017, par. 87-88, acm.nl/sites/default/files/documents/2017-12/besluit-acm-beboet-volkswagen-ag-voor-oneerlijke-handelspraktijken-2017-12-01.pdf, May 8, 2018. In general, about the administrative enforcement of legislation by this ACM: TIGELAAR, Leonieke, *Sanctionering van de informatieplichten uit de Richtlijn consumentenrechten*, diss. Zutphen, Uitgeverij Paris, 2017, p. 194-196.

[57] Judgement of 8 Februari 2017, *Carrefour Hypermarchés SAS v ITM Alimentaire International SASU,* C-562/15, EU:C:2017:95, par. 30.

[58] EUROPEAN COMMISSION, Commission reply to parliamentary questions, questions Nos. E-001284/2011, E-002875/2011 and E-004273/2011, europarl.europa.eu/sides/getAllAnswers.do?reference=E-2011-004273&language=EN, March 23, 2018.

[59] WRBKA, Stevan, «Warranty Law in cases of planned obsolescence – The Austrian situation», *Journal of European Consumer and Market Law*, 2, 2017, p. 67-76.

not prohibit this practice. It merely makes consumers 'informed'. The rationale - one can imagine - is that consumers are at liberty to compare price, producer, characteristics, and so on and decide for themselves whether they support this practice because they are free to choose another product. This rationale can be ranged behind the suggested labelling-policy that has been discussed as a solution before. On an individual level, this will strengthen the consumer's rights, process of decision-making and faith in the honesty of a producer. [60] Another advantage of using this route, is that an unfair commercial practice such as the misleading omission can occur before, during and after the purchase decision, so that also updates for phones or products for the internet-of-things which are delivered later and cause obsolescence, are governed by it.[61] More in particular, using the misleading omission could be proven to be most effective as it does not involve the extensive interpretation of the general clause that we will address in the next section. On the other hand, taking into consideration that planned obsolescence is an environmental problem which one wants to ban rather than condone upon an information requirement, this route is a weak solution.

3.4 The general clause of unfair commercial practice

The fact that one rather wants to stop these practices altogeher, leads to the question whether planned obsolescence could be tackled within the realm of consumer rights, yet addressing producer behaviour. That is, not on the consumer information side, but on the other - producer - side of the same relation. This is where assessing planned obsolescence in the light of the general clause of Article 5 UCPD comes into play, because paragraph 1 states 'Unfair commercial practices shall be prohibited'.

Article 5 paragraph 2 of the Directive explains that a commercial practice shall be unfair if: *(a) it is contrary to the requirements of professional diligence, and (b) it materially distorts or is likely to materially distort the economic behaviour with regard to the product of the average consumer whom it reaches or to whom it is addressed, or of the average member of the group when a commercial practice is directed to a particular group of consumers.*

The practice described here is a specified tort. The consequence of the unfair commercial practice is that the individual consumer may claim the damage suffered from the producer if the two conditions are met cumulatively.

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[60] STRAETMANS, Gert, «Misleading practices, the consumer information model and consumer protection», *Journal of European Consumer and Market Law,* 5, 2016, p. 199-211.

[61] TIGELAAR, Leonieke, *Sanctionering van de informatieplichten uit de Richtlijn consumentenrechten*, diss. Zutphen, Uitgeverij Paris, 2017, p. 28-30.

a) Professional diligence

Professional diligence is defined in Article 2 section h of the Directive: *'professional diligence' means the standard of special skill and care which a trader may reasonably be expected to exercise towards consumers, commensurate with honest market practice and/or the general principle of good faith in the trader's field of activity;*

The term professional diligence consists of two elements: the reasonably expected standard of (1) special skill and (2) care.

The reasonably expected standard of special skill refers to the competence that is necessary in fulfilling professional duties. The standard rises above the competence of an ordinary person. For example, the baker may be expected to know how to bake a loaf of bread and the dentist may be expected to be proficient in dentistry. Problematic according to PAVILLON is the question whose reasonable expectations are to be regarded as leading, given the fact that reasonable expectations are not defined in the UCPD.[62] Here the 'average consumer' comes into play (see 3.3.2). With regard to the use of lifespan shortening techniques, one could argue that an average consumer does not expect and should not reasonably expect a producer to deliberately make its product bad. We note that this rationale can be found in the French legislator's definition of planned obsolescence as 'fraud' and not an honest market practice that an average consumer may reasonably expect.

The average standard of care, the second element of professional diligence, can be found in market practices in a certain field of activity or a code of conduct. Article 1 (f) specifies a 'code of conduct' as 'an agreement or set of rules not imposed by law, regulation or administrative provision of a Member State which defines the behaviour of traders who undertake to be bound by the code in relation to one or more particular commercial practices or business sectors'. Codes of conduct are self-imposed and employed by the majority of producers in an industry. A code of conduct can be guiding (see recital 20 of the UCPD), but the standard market practice can be hard to define. The dissertation of HUISMAN about market ethics, governing the difference between good and bad behaviour, shows that ruling values within a firm and within an industry are hard to establish. Understanding the weight different personal, industrial and societal values have and the influence of the different actors on the production process has been subject of sociological studies.[63] To understand the commonly shared va-lues of several firms in one field of activity is even harder, as was shown in

[62] PAVILLON, Charlotte, *Open normen in het Europees consumentenrecht*, diss., Deventer, Kluwer, 2011, p. 297-302.

[63] HUISMAN, Wim, *Tussen winst en moraal*, diss., 's Gravenhage, Boom Juridische Uitgevers, 2001, p. 9-18.

the 'Lightbulb conspiracy'. Until today, it is not clear whether the planning of the lifespan of lightbulbs was the expression of an unfair - unethical - commercial practice, or of the normal - ethical - market practice in which producers search for a way to make innovative products financially accessible for the greater public, offering a product of a lower quality for a more affordable price.

To compensate this 'open norm', the definition of professional diligence was given a more normative direction, mentioning the 'honest market practice'. A practice therefore cannot be seen as 'in line with professional diligence' on the sole basis that it is endorsed through a detrimental - however commonly used - code of conduct. A common market practice that is morally unacceptable (such as cartels together lowering the average quality to the detriment of the consumer) shall not be a 'fair commercial practice' merely because all producers operate under the same low level of skill and care. This 'standard level' therefore offers guidance, but cannot provide the standard norm of 'professional diligence' when it is dishonest.[64] In this respect, it is interesting that ABBAMONTE compares professional diligence to the common law concept of 'duty of care'.[65] Also TJONG TJIN TAI emphasises that professional diligence consists of duties: '*Diligence is therefore a general manner of specifying the actions that a debtor has to undertake in the performance of the contract, whereby the precise actions have to be determined by the debtor during the performance (possible independently without clear instructions from the creditor), taking into account the concrete circumstances*'.[66]

HARTLIEF warns for the continuous broadening of duties of care that leads to an expansion of tort liability (of which unfair commercial practices are a species) moving away from the parties own responsibility to protectionism.[67] Banking, medical treatment, and building law are obvious examples of areas in which the duties of care have extended. The rationale at the basis of this extension of professional liability is, in HARTLIEF's opinion, that 'bad luck' apparently should not exist anymore. He debates whether this has gone too far and whether a consumer should have a heavier duty to inform himself and investigate the product instead.

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[64] LEGISLATIVE EXPLANATORY COMMENTS (Toelichting), NvW II, Kamerstukken II 2007/08, 30 928, 10, p. 3.

[65] ABBAMONTE, Giuseppe, «The Unfair Commercial Practices Directive: An Example of the New European Consumer Protection Approach», *Columbia Journal of European Law*, 3, 2006, p. 695-712.

[66] TJONG TJIN TAI, Eric, «Professional diligence as a standard in European private law», *Tilburg Private Law Working Paper Series*, 1, 2015, ssrn.com/abstract=2565877, May 9, 2018.

[67] HARTLIEF, Ton, «Autonomie en solidariteit. Beweging in het verbintenissenrecht», *Weekblad voor Privaatrecht en Notarieel Recht,* 6564, 2004, p. 106-108.

We oppose to this reasoning and believe that it is righteous to make an appeal to the duty of care of the producer, which derives from an honest practice. Using techniques to shorten the lifespan is usually done secretly and an average consumer does not have to expect that producers act like that. When engaging in stock exchange HARTLIEF's argument holds true: a consumer should realize he may win or lose. However, when buying a product the planned deterioration cannot be called 'bad luck' or a 'risk' the consumer is bound to take. In support of our vision, we note that consumer products are becoming more and more complex especially when software is a component; even the average well-informed consumer cannot be expected to fully understand their functioning anymore and is surrendered to the goodness of the producer. The skill - which is lacking on the side of the consumer - present at the producer's side causes expectations, and the fact that all parties to a contract should take into account the legitimate interest of the other party, the fact that the producer is the one who has full influence over the situation and can reasonably be expected to reduce the chance of negative effects, costs of measures etcetera, are reasons to impose on the producers this duty.

The producer that functions on a higher than average level of skill and care is professionally diligent.[68]

b) Material distortion of the economic behavior of the average consumer

The general clause of Article 5 UCPD requires not only the practice being contrary to professional diligence, but also the possible distortion of economic behavior of the average consumer.

How to assess whether the omission about the use of a lifespan shortening technique causes or is likely to cause the average consumer to take a transactional decision that he would not have taken otherwise? Similarly to the criteria concerning the misleading omission with regard to transactional decisions, the transactional decision of an average consumer is based on numerous factors, including the price, nature of the product, reputation of the producer and so forth.[69] The reasoning in the Volkswagen-case again forms an answer. When Volkswagen argued that less than 2% of consumers would make transactional decisions solely based on the environmental impact their vehicle would make[70], the Dutch Consumer and Market Authority reasoned that even when environ-

[68] LEGISLATIVE EXPLANATORY NOTES, (Memorie van Toelichting), Kamerstukken II 2006/07, 30 928, 3, p. 13.

[69] See footnote 53.

[70] HAFNER, Rebecca J., WALKER, Ian & VERPLANKEN, Bas, «Image, not environmentalism: A qualitative exploration of factors influencing vehicle purchasing decisions», *Transportation Research Part A: Policy and Practice*, 97, 2017, p. 89-105.

mental impact is not a leading cause for consumers to make transactional decisions, it does play a role in the process of transactional decision-making. By analogy, knowing or realising that a producer uses techniques in a product to shorten the lifespan - one can imagine - has the capacity to influence the decision making of a consumer. He might not condone of these practices either and wish to search for a comparable product of a producers that produce according to 'fair market practices'. In this respect the Fairtrade-example is relevant. It has been shown that consumers pay $1-2 billion a year extra to buy Fairtrade certified goods in the belief that the money goes to farmers in third world countries.[71] Fairtrade is a certification brand, assuring the consumer that the product has been produced and marketed according to the standards of Fairtrade Labelling Organizations International. There are several 'ethical' brands with smaller market shares as well[72], altogether showing that ethics and fairness in trade are a factor on which consumers base their choice of products.[73] By analogy one could reason that (information about) fairness has the capacity to influence consumer decision making. The UCPD does not limit the material distortion test to assessing whether the transactional decision has been distorted, taking into account the facts and circumstances in concreto. It also requires an assessment as to whether a commercial practice is 'likely' (i.e. capable) to have such an impact on the average consumer in abstracto.[74]

Another step is identifying (the expectations of) the average consumer. HARTLIEF describes a trend in which the legislator tries to protect a consumer who is rather naïve and quickly impressed. He also notes that this kind of protection does not have any regard for the plurality that exists within the group of consumers. Which may lead to the unfair designation of a smaller or lesser party in an agreement. Furthermore, the scope of protection is also expanded. There are more and more types of contracts that are now subject to consumer protection regulations, HARTLIEF mentions travel, time-sharing, medical treat-

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[71] If one primarily considers wages, there is no difference in fact between certified and non-certified plantations. There are differences in terms of in-kind benefits that generate savings for workers. Links to several research projects online: wur.nl/en/newsarticle/Is-a-Fairtrade-banana-better-than-a-regular-banana.htm, April 22, 2018.

[72] BALLET, J & CARIMENTRAND, «Fair Trade and the Depersonalization of Ethics», *Journal of Business Ethics*, 92, 2010, p. 317–330.

[73] GRIFFITHS, Peter, «Unlawful conduct, ethics and Fairtrade: controlling the public discourse», griffithsspeaker.com/Fairtrade/Unlawful%20behaviour%20and%20control%20of%20discourse%20Trading%20Standards.docx, April 22, 2018; MOHAN, Sushil, *Fair Trade Without the Froth - a dispassionate economic analysis of 'Fair Trade',* Institute of Economic Affairs, London, 2010.

[74] EUROPEAN COMMISSION, Guidance on the implementation/application of Directive 2005/29/EC on Unfair Commercial Practices, COM(2016) 320 final, eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016SC0163&from=EN, p. 36.

ment, investing on the stock market, and more.[75] His critical assessment of this development will continuously be part of the debate in which consumer rights or producer obligations are reset. We imagine that within the field of planned obsolescence this open norm - 'the average consumer' - will be used by producers to limit the legitimate lifespan expectancy that a consumer may have; or as Brooks STEVENS put it in the 1960s: 'planned obsolescence results from the consumer's desire to own something a little newer, a little better, a little sooner than is necessary'.[76] In other words: the average consumer does not expect long lifespans.

c) Prevention?

What will this course of enhanced producer duties, opposed to the strengthening of consumer right, lead to?

Defining planned obsolescence as a practice contrary to professional diligence that is able to influence economic consumer decisions, has as its consequence that such a practice will be outlawed according to Article 5 paragraph 1 UCPD. It seems like an understandable choice, because the grounds for liability are present: the liable party is the party that is able to factually control the situation and can - for reasons of fraud prevention or environmental sustainability - reasonably be expected to act accordingly. The damages occurring from the practice can be prevented by the producer.

Defining the use of lifespan shortening techniques as contrary to professional diligence, implies in contract law that a producer is no longer allowed to use the practice. If he uses it, the consequence in contract law is that a contract for the sale of such a product is void. The contracting parties will therefore be limited in their autonomy by tort law defining a duty of care and level of skill, or as one can also put it: the consumer is freed from being taken advantage of and regains his autonomy in the sense that the comparing of prices has become easier because a distorting element is taken away. Even though contracting is an area in which the parties have considerable liberty and autonomy, some contracts and practices are not accepted by the legislator.

This route will - in our view - not necessarily lead to an easier instrument for the individual consumer in an individual case, because it can be hard to establish for the individual what the standard levels of care and skill and professional diligence are. Here we wish to remind the reader of the thin line between making an affordable product and making a misleading product. Secondly, even

[75] HARTLIEF, Ton, «Autonomie en solidariteit. Beweging in het verbintenissenrecht», *Weekblad voor Privaatrecht en Notarieel Recht,* 6564, 2004, p. 106-108.

[76] STEVENS, Brooks, «Planned obsolescence - Is it Fair?'», *The Rotarian*, 1960, p. 12; JONKER, Jan, STEGEMAN, Harry & FABER, Niels, De *circulaire economie - Denkbeelden, ontwikkelingen en business modellen*, Nijmegen, Whitepaper, 2016, p. 7-9.

if the standards are laid down in a code of conduct, an individual consumer should still prove that the producer *acted* contrary to it. The French Code de la Consommation shows that no individual used the L441-2 yet, in two years time due to this. However, the goal in the case of defining planned obsolescence as an unfair commercial practice, is beneficial: the tort route will allow the consumer access to redress by means of a claim to compensate him for the damages suffered. One should merely conclude it is proven to not be the most effective in individual cases.

A positive effect of expanding tort liability is that it can have a preventive effect. It will force producers to stop such practices. In that sense it could be proven to be a more effective way than the misleading omission to go about this problem from an environmental perspective, taking into account that planned obsolescence is a broader issue which also touches upon the consumer's interest, but not solely.

The next question, on which we will not elaborate here, is whether the enforcement of the prohibition of such practices is to be found only within the realm of the private consumer law or whether enforcement needs the active part-taking of a governmental institution such as a Consumer or Market Authority that can impose fines as well. We think there is a task at hand for consumer authorities and would like to mention the French road adopted as an example again.

Even though elements of the general clause of unfair commercial practice are only vaguely defined by the Directive - leading to different Member States interpretations in national courts, legal uncertainty and different level playing fields within competition law[77] - using this general clause will advance legal certainty in the sense that the existing literature and jurisprudence are already shaping the contours of professional diligence and care. This provides for clearer guidelines for producers than a new provision would. In this respect, guidance can be given by the European Commission and European Court of Justice to the national Member States authorities and legislators.

4. Concluding remarks

The answer to our first question, which problem consumers are facing, is clear: products are becoming more and more complex and producers have the means to persuade consumers to take transactional decisions. These ways vary (1.1-1.2) from marketing - psychological obsolescence - to fraud of which Volkswagen's software that manipulated harmful emissions in a testing environments is an example. Another way to influence consumer transactional decision

[77] Opinion of Advocate General Trstenjak, *Zentrale zur Bekämpfung unlauteren Wettbewerbs eV v Plus Warenhandelsgesellschaft mbH,* Case C-304/08, EU:C:2010:12, par. 90.

making is - as printer producers and Apple allegedly did - to shorten product lifespan. We acknowledged that one can debate this on an ethical level. On the one hand there is the thesis that prohibiting the practice will lead to more expensive products and less wealth for poorer people and less choice for consumers. Moreover, the thin line between fraudulent planned obsolescence and designing an affordable product with a matching quality - i.e. between being fined or not - could have a chilling effect on producers. On the other hand there is the antithesis that a prohibition will protect the consumer. The synthesis of thesis and antithesis is that tackling planned obsolescence will have positive and negative effects for both producers and consumers. We think - together with policymakers and legislators - that the environmental argument should therefore be decisive, emphasising the necessity to stop planned obsolescence (see 2).

The answer to the question how planned obsolescence can be stopped is not easy. The first question we addressed (3.1-3.2) was whether the existing rules on unfair commercial practices will suffice. We reached the conclusion that the misleading omission (3.3) is an option, combined with the obligation to inform about the composition of the product and the need for services, parts, replacement or repair. Establishing that a consumer would have taken another transactional decision if he would have been informed about the lifespan shortening techniques, is not a barrier. Even when the composition of the products and the use of lifespan shortening techniques are not leading causes for consumers to make transactional decisions, they still play a role in the process of transactional decision-making. This approach matches the proposal of the EESC about labelling products reflecting lifespan compared to the requirements of giving material information identified by sector specific regulation on eco-design, energy consumption and CO2-emissions in the car-industry: 'Labelling is critical when it comes to consumers and transparency. However, labelling is not a cure-all, and may especially not be the most appropriate tool when dealing with business to business products/services.' The disadvantage of the misleading omission-route - besides that it does not cover B2B situations - is that it will not primarily prevent the use of lifespan shortening techniques. It might force producers to make consumers aware, as a result of which consumers may choose the 'fairer' product. Another disadvantage is that it in fact leaves solving what has become an environmental issue to the individual consumer.

The second option we addressed (3.4) was using the general clause of unfair commercial practices to tackle producer behaviour. If we define the use of lifespan shortening techniques as being not professionally diligent. The legal consequence is that the practice will be forbidden, thus having stronger environmental impact. Legitimate questions in this regard are how far-reaching the producers' duty of care is, and whether extended producer liability under consumer law for environmental purposes goes to far? Who are addressee and beneficiary

of this new norm? How big is the realm of interests protected by the harmonized unfair commercial practices directive? However, without disregarding the aforementioned questions, we suggest that it is righteous to appeal to the duty of care of the producer given the fact he has full control and influence over the situation. Formerly, extended duties of skill and care were justified by the special societal function certain professionals have. Today we see that producer liability is extended for environmental purposes within the realm of socially responsible entrepreneurship. This is a trend as consumers are becoming more and more critical regarding the quality of products, their origin, taking into account sustainability, child labour, fair distribution and climate.[78] In this regard, the benefit of adopting a very precise rule to tackle planned obsolescence, has to be emphasised: it will provide for a legal basis which leaves no doubt as to the expected behaviour of producers. Based on such a specific rule not only the consumer or a market authority can enforce the norm, but also the company directors can be held liable by the supervisory board for example based on the principle of legality. A precise rule has to be complied with, however whether directors have the duty to pursue the Corporate Social Responsibility goals is not clear.[79] Fraud is a breach of directors' duties even if it secures beneficial business.[80] Adopting a specific rule will make enforcement within a company possible, next to environmental or economic criminal enforcement (*lex certa* and *lex scripta*), besides private law individual consumer claims and market authority enforcement through administrative law.

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[78] See many research areas within this realm on wur.nl/en/Research-Results/Themes/Socially-responsible-entrepreneurship.htm.

[79] ROTT, Peter, «Directors' Duties and Corporate Social Responsibility under German Law – Is Tort Law Litigation Changing the Picture?», *NJCL,* 1, 2017, p. 11-27; a breach of these duties under company law could gives rise to damage claims by the supervisory board on behalf of the company. Based on this, the supervisory board of Volkswagen AG is currently considering to sue the directors of Volkswagen AG and Audi for at least negligent omission to prevent 'Dieselgate'. GNIRKE, Kristina, Winterkorn und Stadler droht Millionenforderung, *Spiegel online*, spiegel.de/wirtschaft/unternehmen/volkswagen-martin-winterkorn-und-rupert-stadler-droht-millionenforderung-a-1141287.html, April 26, 2018, see also: NEMETH, Kristin & MORAIS CARVALHO, Jorge, «"Dieselgate" and Consumer Law: Repercussions of the Volkswagen scandal in the European Union», *European Journal of Consumer and Market Law,* 1, 2016, p. 35.

[80] HENNING-BODEWIG, Frauke, «Corporate social responsibility, the VW scandal and the UCP Directive», *European Journal of Consumer and Market Law,* 5, 2016, p. 153.

THE CREWLINK AND RYANAIR CASES AND THE INTERNATIONAL EMPLOYMENT CONTRACT

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Abstract: The international employment contract is established in the Brussels I Regulation through a system of favourable treatment in relation to the employee, party which is considered contractually weaker. This system is characterised, in general terms, by the restrictive use of agreements conferring jurisdiction and by providing the employee with forums designed according to his procedural position, benefiting the employee in relation to the employer. One such forum is the court for the place where or from where the employee habitually carries out his work, which has jurisdiction to decide disputes resulting from an international employment contract where the plaintiff is the employee. The concept of the place where or from where the employee habitually carries out his work has been the subject of reflection by the Court of Justice of the European Union (CJEU), which has pronounced itself through a broad interpretation that allows the determination of the place that has a more significant connection with the dispute. The place where the employee habitually carries out his work can be difficult to ascertain in those situations where work is carried out in several Member States, so the CJEU has developed an evidence-based method which takes into account the factual material present in the case, in order to determine that location. In the *Crewlink* and *Ryanair* cases, which are now commented, the CJEU returns to the legal regime relating to international jurisdiction of the international employment contract, in two situations involving the work of aircraft crews that

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because of the large relocation they present, constitute a challenge for the interpretation of the rules foreseen in the Brussels I Regulation.

Keywords: International employment contract; place where the employee habitually carries out his work; international jurisdiction.

Summary: 1. The Ryanair and Crewlink cases; 2. Brussels I Regulation 3. The protection of the employee as the weaker negotiating party 3.1. The choice-of-court agreements 3.2. International jurisdiction 4. Conclusions

1. The *Ryanair* and *Crewlink* cases;

On 17 September 2017, the CJEU decided on the joined cases *Sandra Nogueira, Victor Perez-Ortega, Virginie Mauguit, Maria Sanchez-Odogherty, José Sanchez-Navarro v Crewlink Ireland Ltd* (hereinafter referred to as the *Crewlink* case) and *Miguel José Moreno Osacar v Ryanair Designated Activity Company* (hereinafter referred to as the *Ryanair* case)[2], which concerned an international employment contract.

In the *Ryanair* case, *Moreno Osacar* celebrates an employment contract in Spain with *Ryanair*, which is an airline whose headquarters are in Ireland. The functions to be performed by *Moreno Osacar* would correspond to those of the cabin crew, including, but not limited to, security, handling, assistance and control of passengers, airport boarding duties, on board sales, cleaning of the airplane interior and safety checks.

The contract was written in English, containing an agreement conferring jurisdiction in favour of the Irish courts and a choice-of-law agreement setting the Irish law as the law applicable to the employment contract. The contract also indicated that *Moreno Osacar*'s work would occur in Ireland, since his duties were carried out on board *Ryanair* aircraft registered in Ireland. In the contract, the Charleroi airport, in Belgium, was designated as the employee's home base and established that the employee must reside less than one hour away from that base, which meant *Moreno Osacar* had to change his residence to Belgium.

It should be noted that under the terms of article 17 of the Chicago Convention on International Civil Aviation of 7 December 1944, in force in all Member States, aircraft are nationals of the State in which they are registered, which means that the aircraft on board of which *Moreno Osacar* performed his cabin crew duties had Irish nationality. In addition, the need to designate a home base for a crew member on the civil aviation employment contracts resulted from

[2] *Sandra Nogueira, Victor Perez Ortega, Virginie Mauguit, Maria Sanchez Odogherty, José Sanchez Navarro v Crewlink Ireland Ltd* (C*168/16), and Miguel José Moreno Osacar v Ryanair Designated Activity Company, formerly Ryanair Ltd (C169/16)*, Joined cases (C168/16) and (C169/16), of 17 September 2017, ECLI:EU:C:2017:688.

Regulation No 3922/91 of 16 December 1991 on the harmonisation of technical requirements and administrative procedures in the field of civil aviation[3], as amended by Regulation No 1899/2006 of 12 December 2006[4]. The home base would be «the location nominated by the operator to the crew member from where the crew member normally starts and ends a duty period or a series of duty periods and where, under normal conditions, the operator is not responsible for the accommodation of the crew member concerned»[5].

On 16 June 2011, *Moreno Osacar* quit and brought proceedings before the Belgian courts, based on Belgian law, in order to obtain compensation from *Ryanair* for failure to comply with its obligations under that law. *Ryanair* contests the jurisdiction of Belgian courts to assess the action by invoking the jurisdiction agreement in favour of the Irish courts, established in the employment contract. It also refers to a number of circumstances which it considers to reveal a close connection between the dispute and the Irish courts, as an element of the attribution of jurisdiction to these courts, namely: the *electio iuris* in favour of Irish law; in matters of taxation and social security, *Moreno Osacar* was subject to Irish law; the employment contract was performed on board registered Irish aircraft and, therefore, subject to Irish law; although the contract was signed in Spain by *Moreno Osacar*, it was only signed by *Ryanair* at its seat in Ireland.

It was also apparent from the action that the Charleroi airport was the place where *Moreno Osacar* started and ended his working days, and that it was also the place where he had to remain in order to substitute absent crew members.

Following an initial decision by the Belgian court, stating the lack of jurisdiction to assess the dispute, the Mons Higher Labour Court, to which *Moreno Osacar* appealed, in light of the doubts raised by the case, suspended the proceedings and approached the CJEU in order to clarify the doubts regarding the international jurisdiction of Belgian courts to assess this labour dispute.

The *Crewlink* case was attached to the *Ryanair* case because of the similarities between the two. Again, we have an international employment contract, where the work is performed on board an aircraft, namely *Ryanair* aircraft. Be-

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[3] Annex III (Common technical requirements and administrative procedures applicable to commercial transportation by aeroplane), subpart Q (Flight and duty time limitations and rest requirements), OPS 1.1090, point 3.1.

[4] The Annex III to *Regulation (EEC) No 3922/91 was repealed by Regulation No 216/2008 of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency,* under the terms foreseen in article 69.

[5] According to OPS 1.1095, point 1.7, of subpart Q, of Annex III, of *Regulation No 1899/2006 of 12 December 2006 amending Council Regulation (EEC) No 3922/91 on the harmonisation of technical requirements and administrative procedures in the field of civil aviation.*

tween 2009 and 2010, *Nogueira* and others, of Portuguese, Spanish or Belgian nationality, concluded an employment contracts with a company with a seat in Ireland – *Crewlink*. Although the contracts were signed with *Crewlink*, these employees would be assigned to serve as cabin crew members on board *Ryanair* aircraft.

The employment contracts, written in English, had a choice-of-law agreement in favour of the Irish law to regulate the contract and an agreement conferring jurisdiction to the Irish courts. It was stipulated in the contract that remuneration should be paid to an account in an Irish bank and that the tasks should be carried out on board *Ryanair* aircraft, registered in Ireland, considering the employment seat in Ireland. Although the employer could transfer employees to another airport, the employees' home base was the Charleroi airport, in Belgium, and employees were required to reside one hour away from the home base.

In 2011, due to dismissal or resignation, the abovementioned employment contracts are terminated and the employees approach the Belgian labour court, claiming the payment of compensation. Following the declaration of incompetence by the court of first instance and subsequent appeal, the Mons Higher Labour Court addresses the CJEU, once again, with doubts regarding the establishment of jurisdiction in this case.

The action reveals that the employees systematically started and ended their work day at the Charleroi airport, the home base for the service they performed, and where they waited to substitute potentially absent crew members. In addition, it was clear from the employment contracts that the employees were required to abide by *Ryanair*'s aviation security policy, the presence of employees at the Charleroi airport at a place shared by *Ryanair* and *Crewlink* was proved and *Ryanair*'s exercise of disciplinary power over *Crewlink* employees, which indicated a work community between employees of both companies.

2. Brussels I Regulation

In the present case, there is a question of international jurisdiction, and therefore, it is necessary to call upon the existing regulations on jurisdiction and the enforcement of judgments in civil and commercial matters. In this domain, the most recent legal instrument is *Regulation No 1215/2012 of 12 December 2012 on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters* (Brussels I *bis*), which governs international jurisdiction and the recognition of foreign decisions, replacing Regulation 44/2001 (Brussels I),

pursuant to article 80[6]. In turn, the latter replaced the *1968 Brussels Convention on Jurisdiction and the Enforcement of Judgments in Civil and Commercial Matters* between the Member States, adopting its structure and, to a large extent, its text. There is an interpretative continuity between these three legal texts, which has been adopted by the CJEU, seeing as the most recent legal instruments are an update of the previous ones[7].

The Brussels I *bis* Regulation is one of the reference legal instruments in the European Union's (EU) policy of judicial cooperation in civil matters[8], including the unification of international jurisdiction rules, rules for the recognition of judgments made by the courts of the Member States and for the recognition of authentic instruments drawn up or registered in a Member State and court settlements from a Member State. This Regulation repealed the Brussels I Regulation (article 80 of Brussels I *bis*) and is applicable as of 10 January 2015 (article 81 of Brussels I bis), to legal proceedings instituted, to authentic instruments drawn up or registered or court settlements approved or concluded on or after that date. At an earlier date, the Brussels I Regulation shall apply, which entered into force on 1 March 2002, pursuant to its own article 76, being determined, in its own article 66(1), that the Regulation legal framework shall apply to legal proceedings instituted or authentic instruments after the entry into force thereof. The present case concerns precisely the legal framework relating to the employment contract and, in light of its territorial scope, the application of the Brussels I Regulation.

The Brussels I Regulation governs civil and commercial matters (article 1), excluding the issues listed in article 1(1), *in fine*, and article 1(2): the status or legal capacity of natural persons, rights in property arising out of a matrimonial relationship, wills and succession; bankruptcy; social security; arbitration; revenue, customs or administrative matters. In addition, the application of the

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[6] Regarding the main amendments made by the Brussels I bis Regulation to the previous text, v. Gonçalves, Anabela Susana de Sousa, «A Revisão do Regulamento Bruxelas I Relativo à Competência Judiciária, ao Reconhecimento e à Execução de Decisões em Matéria Civil e Comercial», in *Estudos em Comemoração dos 20 Anos da Escola de Direito da Universidade do Minho*, Mário Monte *et al.* (coord.), Coimbra, Coimbra Editora, 2014, 39-59 ff.

[7] In this sense, v. the CJEU rulings: *Reisch Montage AG c. Kiesel Baumaschinen Handels Gmbh*, of 13 July 2006, case C-103/05; *Falco Privatstiftung and Thomas Rabitsch v. Gisela Weller-Lindhorst*, *cit.*; *Peter Pammer v. Reederei Karl Schlüter GmbH & Co. KG (C-585/08) and Hotel Alpenhof GesmbH v. Olivier Heller (C-144/09)*, of 7 December 2010, joined cases C-585/08 and C-144/09, consulted on *http://eur-lex.europa.eu* [27/10/2011].

[8] Regarding the policy of judicial cooperation in civil matters, v. Gonçalves, Anabela Susana de Sousa, «Cooperação judiciária em matéria civil e Direito Internacional Privado», *in Direito da União Europeia*, Coimbra, Almedina, 2016, 339-391 ff.

Brussels I Regulation requires that the situation in dispute contains an international element, since the Regulation does not apply to purely internal situations[9].

In regards to spatial scope, the rules of international jurisdiction of the Brussels I Regulation apply in situations where the defendant is domiciled in a Member State, pursuant to article 2(1) and 3(1)[10]. Article 4(1), *in fine*, however, exempts certain situations in which the courts of the Member States may have jurisdiction, independently of the defendant's domicile, such as situations of exclusive jurisdiction or the existence of agreements conferring jurisdiction (articles 22 and 23). In turn, the rules of jurisdiction apply to judgments given by the courts of the Member States, within the material scope of Brussels I, pursuant to article 32 of the Regulation. The Regulation also applies to the enforceability in the Member States of authentic instruments drawn up or registered in another Member State and also enforceable within the Member States in its material scope, pursuant to article 57. Finally, it also governs, under the same conditions, the enforcement in a Member State of court settlements which have enforceable value in the Member State of origin (article 58).

3. The protection of the employee as the weaker negotiating party

The general rule of international jurisdiction, establishes in article 2(1) of the Brussels I Regulation, confers jurisdiction to the court of the defendant's domicile. In addition to the general rule, the Regulation contains rules of special jurisdiction which establishes alternative forums in relation to the general rule and which were designed in light of the dispute's proximity with the court (articles 5 to 7), as well as in matters relating to contractual or extra-contractual liability, which are inspired by the principle of proximity and are intended to safeguard the parties' legitimate expectations and to promote the sound admi-

[9] This was stated in the Jenard Report and in the Schlosser Report, as well as in a wide range of CJEU jurisprudence: JENARD, Paul, «Report on the Convention of 27 September 1968 on jurisdiction and the enforcement of judgments in civil and commercial matters», *OJ C* 59, 1979, f. 8; SCHLOSSER, Peter, «Report on the Convention of the Association of the Kingdom of Denmark, Ireland and the United Kingdom of Great Britain and Northern Ireland to the Convention on jurisdiction and the enforcement of judgments in civil and commercial matters and to the Protocol on its interpretation by the Court of Justice», *OJ C* 59, 1979, 81 f.; CJEU, *Andrew Owusu v N. B. Jackson, trading as «Villa Holidays Bal-Inn Villas»*, Case C-281/02, of 1.3.2005, § 25, still concerning the Brussels Convention, among others.

[10] It also results from the argument 8 of Brussels I Regulation.

nistration of justice[11]. However, the rules of international jurisdiction, establishes in the Regulation that seeks to protect the weakest negotiating party, have priority.

The Brussels I Regulation has a set of rules of international jurisdiction aimed at protecting the weaker party in the legal relationship, which is characterised by an increase in the number of forums to which the weaker party may resort, compared to the counterparty, which is limited practically to the court of the defendant's domicile, establishing some norms, including a *forum actoris*, and setting more rigorous requirements for the valid conclusion of a choice-of-court agreements. This list includes the rules of jurisdiction relating to the insurance contract, the consumer contract and the employment contract[12].

Originally, in the Brussels Convention, the employment contract did not have this protective treatment in relation to one of the parties, which was only introduced in Convention 89/535/EEC[13] in the then article 5(1), 2nd part. Subsequently, the Brussels I Regulation introduces into the legal regime of the employment contract, a treatment similar to consumer and insurance contracts, both on

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[11] Regarding the rules of special jurisdiction and the justification of the forums in question, v., *v.g.*, Carbone, Sérgio, *Il nouvo sapazio giudiziario dalla Convenzione di Bruxelles al Regolamento CE 44/2001*, 4th Ed., Torino, G. Giappichelli Editore, 2002, 81 ff.; Real, Manuel Desantes, 1986, *La Competencia Judicial en la Comunidad Europea*, Barcelona, Bosch, 1986, 287 ff.; Droz, Georges A. L., *La compétence judiciaire et l´effet des jugements dans la communauté économique européenne selon la Convention de Bruxelles du 27 septembre 1968*, Université de Droit, d'Economie et des Sciences Sociales Oaris II, Paris, 1971, 71 ff.; Gaudemet-Tallon, Hélène, *Compétence et Exécution des Jugements en Europe, Matières Civiles et commerciale*, 5th Ed., L.G.D.J., Issy-les-Moulineaux, 2015, 195-340 ff.; SALERNO, Francesco, 2006, *Giurisdizione ed efficacia delle decisioni straniere nel regolamento (CE) n. 44/2001 (La revisione della Convenzione di Bruxelles del 1968)*, 3rd Ed., Cedam, 2006, 154-155 ff.; Sousa, Miguel Teixeira de, Vicente, Dário Moura, *Comentário à Convenção de Bruxelas*, Lex, Lisbon, 1994, 93-94 ff.

[12] Regarding these rules aimed at protecting the weaker party, v., *v.g.*, HEISS, Helmut, «Jurisdiction in matters relating to insurance», in *Brussels I Regulation*, Ulrich Magnus, Peter Mankowski (coord.), 2nd Ed., Munich, Sellier European Law Publishers, 2012, 331-362 ff.; NIELSON, Peter Arnt, «Jurisdiction over consumer contracts», in *Brussels I Regulation*, Ulrich Magnus – Peter Mankowski (Coord.), 2nd Ed., Munich, Sellier European Law Publishers, 2012, 363-391 ff.; Esplugues Mota, Carlos, Palao Moreno, Guillermo, 2012 «Jurisdiction over individual contracts of employment», in *Brussels I Regulation*, Ulrich Magnus – Peter Mankowski (Coord.), 2nd Ed., Munich, Sellier European Law Publishers, 2012, 391-412 ff.; PINHEIRO, Luís de Lima, *Direito Internacional Privado, Competência Internacional e Reconhecimento de Decisões Estrangeiras*, Vol. III, 2nd Ed., Coimbra, Almedina, 2012, 136-164 ff.; STONE, Peter, *EU Private International Law, Harmonization of Laws*, Edward Elgar, Cheltenham – UK, 2008, 113-132 ff.

[13] *Convention on the accession of the Kingdom of Spain and the Portuguese Republic to the Convention on jurisdiction and the enforcement of judgments in civil and commercial matters and to the Protocol on its interpretation by the Court of Justice with the adjustments made to them by the Convention on the accession of the Kingdom of Denmark, Ireland and the United Kingdom of Great Britain and Northern Ireland and the adjustments made to them by the Convention on the accession of the Hellenic Republic*, published in *OJ L* 285, 3.10.1989, 1-98 ff.

the systematic plan, for its treatment in an autonomous section, and by clearly assuming the need for a more favourable treatment for the weaker contractual party (argument 13). This legislative option is maintained in the current Brussels I *bis* Regulation, which is assumed in Recital 18 that establishes the need for more favourable rules of international jurisdiction for the weaker negotiating party.

The view of the employee as the weaker contractual party results from the configuration of the legal employment relationship itself, since it implies a situation of legal subordination in «(...) in which one person is constituted before the other (the employer), and that it is analysed within the existence of a duty of obedience towards him and in the acceptance of a disciplinary power to be exercised by him.»[14] Due to the situation of legal subordination, because it is a contract of indefinite duration that is being determined in a phased manner according to the employer's orders, to which the employee is subjected, the employee is considered to be the weaker negotiating party in several legal systems. This «(...) led legislation to attempt to compensate the unfavourable starting situation by means of an employment relationship regime which, by treating both parties of the relationship unequally, would compensate the imbalance in which the employee finds himself/herself initially»[15]. This attempt by the legislator to rebalance the legal relationship, through a more favourable treatment to the weaker negotiating party, was also verified in the legal regime of international employment contract: both regarding the scope of the rules of international jurisdiction; and in the scope of conflict of laws, initially in article 6 of the *Rome Convention of 1980 on the Law Applicable to Contractual Obligations* and, more recently, in article 8 of *Regulation No 593/2008 of the European Parliament and of the Council of 17 June 2008 on the law applicable to contractual obligations* (Rome I).

The legal regime of the international employment contract is found in section V of the Brussels I Regulation, where the rules of international jurisdiction that are more favourable to the employee can be found[16]. It was the interpretation of the rules contained therein which led to CJEU's preliminary ruling by the Belgian courts.

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[14] RAMOS, RUI MOURA, *Da Lei Aplicável ao Contrato de Trabalho Internacional*, Coimbra, Almedina, 1991, 723 f. (author's translation).

[15] *Idem, ibidem*, 725 f. (author's translation).

[16] Among others, v. CJEU, *Ahmed Mahamdia v People's Democratic Republic of Algeria*, case C154/11, of 19 July 2012, ECLI:EU:C:2012:491, § 44; *idem*, *Glaxosmithkline, Laboratoires Glaxosmithkline v Jean-Pierre Rouard*, case C462/06, of 22 May 2008, ECLI:EU:C:2008:299, § 17; *Sandra Nogueira, Victor Perez Ortega, Virginie Mauguit, Maria Sanchez Odogherty, José Sanchez Navarro v Crewlink Ireland Ltd* (C*168/16), and Miguel José Moreno Osacar v Ryanair Designated Activity Company, formerly Ryanair Ltd (C169/16)*, Cit., § 49.

Before proceeding, clarification should be given regarding the interpretation of the rules foreseen in the Regulation, taking into account CJEU indications.

Conflict of laws, rules of international jurisdiction and rules on recognition have a complementary connection among themselves when it comes to regulating private international issues, which is evident in the European Union various legal acts which address this matter. This complementarity results from the identity of objectives between the rules in question, from rationality and the systematic functioning of the EU legal order, which argue in favour of an autonomous interpretation in relation to the Member States' national laws, as well as an articulated interpretation between legislative acts in the scope of judicial cooperation[17].

The CJEU has stated its position through an autonomous interpretation of the concepts, both in the Brussels Convention and in the Brussels I Regulation, taking into account their respective spirit, objectives and principles, as a means of ensuring the consistent application of those instruments[18], and is reaffirmed in the case being commented at the moment[19].

The articulated interpretation is acknowledged, on the one hand, in the preamble of various legal acts, such as Recital 7 of the Rome I Regulation, which emphasises the need to apply the rules established in that Regulation, pursuant to the rules of the Brussels I Regulation, taking into account the need for joint implementation of both and the sharing of common objectives. This articulated interpretation between the Brussels Convention and the Brussels I Regulation with the Rome Convention and the Rome I Regulation has already been stated,

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[17] Regarding this autonomous and articulated interpretation, v. Gonçalves, Anabela Susana de Sousa, «Cooperação judiciária em matéria civil e Direito Internacional Privado», *in Direito da União Europeia*, Almedina, Coimbra, 2016, 330-291 ff.

[18] V., *v.g.*, Rulings (CJEU), *LTU Lufttransportunternehmen Gmbh & Co. KG v Eurocontrol*, of 14 October 1976, case 29/76; État néerlandais c. Reinhold Rüffer, of 16 December 1980, case 814/76; *Francesco Benincasa v Dentalkit Srl*, of 3 July 1997, case C-269/95; *Roche Nederland BV and others v Frederick Primus and Milton Goldenberg*, of 13 July 2003, case C-539/03; *Gesellschaft für Antriebstechnik mbH & Co. KG v Lamellen und Kupplungsbau Beteiligungs KG*, of 13 July 2006, case C-4/03; and *Falco Privatstiftung and Thomas Rabitsch v Gisela Weller-Lindhorst*, of 23 April 2009, case C-533/07.

[19] *Sandra Nogueira, Victor Perez Ortega, Virginie Mauguit, Maria Sanchez Odogherty, José Sanchez Navarro v Crewlink Ireland Ltd* (C*168/16), and Miguel José Moreno Osacar v Ryanair Designated Activity Company, formerly Ryanair Ltd (C169/16)*, Cit., § 47.

on several occasions, by the CJEU[20] and is once again emphasised in the case commented[21].

3.1. The choice-of-court agreements

The protection of the weaker party in the employment contract is verified, from the start, in relation to the choice-of-court agreements.

The possibility of the parties celebrating an agreement conferring jurisdiction results from the recognition of the principle of party autonomy in this domain and the interests of the contracting parties. The reasons that may determine the author's translation s may be of a diverse nature and include the ease in determining the competent jurisdiction in the event of a dispute, increasing the procedural speed in resolving the dispute; the need to produce evidence and proximity to the possible dispute; the possibility of coincidence *forum-ius*, choosing the court according to the applicable law, with advantages in the sound administration of justice; the ease in recognising and executing the decision; the concentration of related disputes in the courts of the same State, with the consequent reduction of costs. Thus, in addition to the recognition of the sphere of freedom of the contracting parties, the choice-of-court agreements allow for certainty, security and predictability in relation to the competent court, reducing tactic delays regarding court jurisdiction[22], with gains in the swift resolution of the dispute.

The protection of the weaker party is expressed in the context of the choice-of-court agreements, since there was a concern that resorting to them could not undermine the protection conferred to the weaker contracting party. Therefore, certain cautions can be found in the Brussels I Regulation, in order to

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[20] CJEU ruling, *Heiko Koelzsch v État du Grand-Duché de Luxembourg*, case C-29/10, of 15 March 2011, consulted in *http://eur-lex.europa.eu* [27/10/2011]; CJEU, *Peter Pammer v Reederei Karl Schlüter GmbH & Co. KG (C-585/08) and Hotel Alpenhof GesmbH v Olivier Heller (C-144/09)*, *cit.*; CJEU, *Jan Voogsgeerd v Navimer SA*, case C-384/10, of 15 December 2011, ECLI:EU:C:2011:842.

[21] CJEU, *Sandra Nogueira, Victor Perez Ortega, Virginie Mauguit, Maria Sanchez Odogherty, José Sanchez Navarro v Crewlink Ireland Ltd* (C*168/16), and Miguel José Moreno Osacar v Ryanair Designated Activity Company, formerly Ryanair Ltd (C169/16)*, Cit., § 47.

[22] Note, as referred by Ulrich MAGNUS, «Art. 23» *in Brussels I Regulation*, Ed. Ulrich Magnus/Peter Mankowski, 2nd Revised Edition, Sellier European Law Publishers, 2012, 444 f., a choice-of-court agreement shall not prevent a court from examining its jurisdiction when one of the parties, in breach of a choice-of-court agreement, proposes to take action in that court.

prevent the stronger contracting party from manipulating the formation of will and the consent of its co-contractor[23].

In these terms, and pursuant to article 21 of the Brussels I Regulation, the rules of jurisdiction foreseen in the Regulation can only be derogated by agreements conferring jurisdiction in two situations.

The first is established in article 21(1) and consists in the fact that the choice-of-court agreements are subsequent to dispute. Once the dispute has arisen, it is considered that the employee is already aware of the interests and rights he is entitled to, and his consent to an agreement conferring jurisdiction can be presumed to be conscious and in his interest.

The second situation is foreseen in article 21(2), which establishes the possibility that the agreement conferring jurisdiction can be established at a time prior to the dispute, as long as it allows the extension of the range of jurisdictions to which the employee can resort to, in addition to those indicated by the rules of the Regulation. In the latter case, the increase in the number of courts to which the employee, as the plaintiff, can resort to is considered to be of his benefit. It should be noted that, in this second situation, the forums resulting from the choice-of-court agreements are added to those resulting from articles 18 and 19 of the Regulation, not excluding the jurisdiction of the latter, as already stated by the CJEU[24]. Taking into account the protective purpose of article 21, it concludes that even if there is a choice-of-court agreement, the employee may ignore its content and resort to the courts resulting from articles 18 and 19[25].

The clause conferring jurisdiction to the Irish courts was the result of the employment contract and had been stipulated before the dispute arose. Thus, it would have to respect article 21(2), and would only be substantially valid if the list of courts to which the employee could bring proceedings in the event of a dispute with the employer was extended. What happened in the case was precisely the opposite. The jurisdiction clause was restrictive and limited the employees' possibilities of appealing to courts besides the Irish ones, in breach of the provisions of article 21(2). In this sense, and according to the best interpretation, the choice-of-court agreement was considered not applicable to the employees[26].

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[23] *V.* Ramos, Rui Manuel Moura, «Remarques sur les développements récents du droit international privé portugais en matière de protection des consommateurs», *in Estudos de Direito Internacional Privado e de Direito Processual Civil Internacional*, Coimbra Editora, 2002, 33 f.

[24] CJEU, *Ahmed Mahamdia v People's Democratic Republic of Algeria*, Case C-154/11, of 19 July 2012, ECLI:EU:C:2012:491, § 62.

[25] *Idem, ibidem*, §63.

[26] CJEU, *Sandra Nogueira, Victor Perez Ortega, Virginie Mauguit, Maria Sanchez Odogherty, José Sanchez Navarro v Crewlink Ireland Ltd* (C*168/16), and Miguel José Moreno Osacar v Ryanair Designated Activity Company, formerly Ryanair Ltd (C169/16)*, Cit., § 54.

3.2. International jurisdiction

The Brussels I Regulation determines rules of international jurisdiction for the individual employment contract, which establishes a procedurally favourable treatment for the employee, as results from Recital 13 of the Regulation.

Pursuant to article 19, an employer domiciled in a Member State may be sued by the employee: in the courts where the employer is domiciled (1); or in the Member State in which the employee habitually carries out his work or in the courts for the last place where he did so (2)(a)]; or in the Member State in the courts for the place where the business which engaged the employee is or was situated, if the employee does or did not habitually carry out his work in any one country (2)(b)]. In turn, the employer may bring proceedings against the employee only in the courts of the Member State in which the employee is domiciled (article 20). An analysis of the listed rules shows that there is a difference in the tools available to each one of the contracting parties, seeing as the employee has several courts to choose from, and the employer is already sentenced to the courts of the Member State where the employee is domiciled.

It is precisely the interpretation of the rule set in article 19(2)(a) which justified the reference for a preliminary ruling by the Belgian court, and the question was referred to the CJEU, if the habitual place of performance of the employment contract could be equated with the concept of home base established in Regulation No 3922/91 as «the location nominated by the operator to the crew member from where the crew member normally starts and ends a duty period or a series of duty periods and where, under normal conditions, the operator is not responsible for the accommodation of the crew member concerned»[27].

First of all, it is important to look at the interpretation made by the CJEU in relation to the concept *place where the employee habitually carries out his work*. This concept is also used as a subsidiary connecting factor in the conflict-of-laws rule concerning the international employment contract. In the absence of a chosen law, the law of the country where the employment contract is habitually carried out (*lex loci laboris*) will be applied, pursuant to article 6(2)(a) of the Rome Convention and article 8(2) of the Rome I Regulation. Therefore, it is also, pursuant to article 6(1) of the Rome Convention and article 8(1) of the Rome I Regulation, the law that establishes the standard for the employee protection, since the law chosen by the parties will be rejected if the mandatory rules of the subsidiary applicable law are more protective of the employee.

[27] According to OPS 1.1095, point 1.7, of subpart Q, of Annex III, of Regulation No 1899/2006 of 12 December 2006 amending Council Regulation (EEC) No 3922/91 on the harmonisation of technical requirements and administrative procedures in the field of civil aviation.

The advantages resulting from this connection in determining the applicable law are several. First of all, the subordination of all the employer's employees who work in the same place to a similar legal framework, which is beneficial to the employer in terms of organisation and management of his human resources[28]. In addition, the economic and social consequences of work have a primary impact on the country in which the work is carried out, which will be interested in having the rules governing these working conditions applied and subjecting those working in its territory to the same legal regime. This means the employee will have some information about the law applicable, right from the start, thanks to the activity of the unions representing the employees. In addition, the place where work is carried out represents the centre of gravity of the employment contract, presenting advantages over other possible connecting factors[29]. The European Union interest also justifies the adoption of this connection: to those who work within the EU territory, the labour law in force in Europe will be applied, originating mainly from the EU and done to facilitate the free movement of workers within the EU (article 45 TFEU), to assist freedom of establishment (article 49 TFEU) and to reduce the competitive advantages between States based on their labour legislation.

Now, article 19(2)(a), adopts the same jurisdiction factor to the international employment contract, achieving the coincidence *forum-ius*, which is justified for several reasons. The legal regulation of the employment contract is constituted by a set of internal rules, some of public nature, imperative, some belonging to the public policy of the forum State and others assuming the nature of overriding mandatory provisions. The nature of these provisions aim to assign certain rights to the employee, based on the principle of *favor laboris*. Consequently, there is also interest in the territorial application of these laws regarding working conditions, working hours, holidays, among others, for reasons of peace and social stability. All employees who perform their work in the same State should benefit from the protective status granted by that State to the

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[28] In this sense, among others, Corrao, Maria Ersilia, «I Rapporti di Lavoro nella Convenzione Europea sulla Legge Applicabile alle Obbligazioni Contrattuali», *RDIPP*, Anno XX, 1984, pp. 104-105; Simon-Depitre, Marthe, «Travail», *in Répertoire de Droit International,* Dalloz, direction Ph Francescakis, T. II, 1969, 970 f.; Villani, Ugo, *La Convenzione di Roma Sulla Legge Applicabile ai Contratti*, Bari, Cacucci Editore, 1997, 159 f.

[29] *V.* the comparison made in relation to nationality or residence done by Ramos, Rui Moura, *Da Lei Aplicável ao Contrato Individual de Trabalho*, *Da Lei Aplicável ao Contrato de Trabalho Internacional*, Coimbra, Almedina, 1991, 910 f.

employee, so traditionally, many of these standards have territorial application[30]. This is because there are rules that assign rights to the employee in relation to his employer; others assign rights to the employee according to the State in which he performs his employment contract. Therefore, the coincidence *forum/ius* allows the avoidance of problems inherent to the extraterritorial application of standards of labour law. From this coincidence *forum/ius* will also result a sound administration of justice, seeing as the competent court will apply the forum law, the one it knows best, which facilitates the determination of its content, reduces situations of judicial error, with gains also in the realm of speed in the resolution of the dispute.

In addition, the court of the place where the employee habitually carries out his work will be the court closest to the labour dispute, which makes it easier to produce evidence. Furthermore, it is also considered that this jurisdiction allows the employee to bring proceedings against the employer or defend himself with less costs associated[31], which is a reasonable argument, taking into account those situations where the employee is domiciled in the country where the employment contract is performed or the legal support that can be given to the employee working in a certain territory by the unions established there.

As already pointed out, it is necessary to refer to the content of the concept place where the employee habitually carries out his work through an articulated interpretation between the Brussels Convention and the Brussels I Regulation with the Rome Convention and the Rome I Regulation[32].

According to the CJEU case law, the notion of *place where the employee habitually carries out his work* must be interpreted broadly, taking into account

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[30] *V.* on Gamillscheg, Franz, «Labour Contracts», *IECL*, vol. III, 3 ff.; Knapp, Blaise, «La protection des travailleurs des sociétés membres du groupe», *in Colloque International sur le Droit International Privé des Groupes de Sociétés*, org. Le centre d´Études Juridiques Européennes de la Faculté de Droit de Genève, Genève, May 1974, 151 ff.; Knapp, Felice Morgenstern-Blaise, «Multinational Enterprises and Extraterritorial Application of Labour Law», *ICLQ*, vol. 27, 1978, 774 ff.

[31] CJEU, *Herbert Weber v Universal Ogden Services Ltd*., case C-37/00, of 27 February 2002, ECLI:EU:C:2002:122, § 49; *idem*, *Petrus Wilhelmus Rutten v Cross Medical Ltd. Rutten*, Case C-383/95, of 9 January 1997, § 22 and 24; *idem*, *Sandra Nogueira, Victor Perez Ortega, Virginie Mauguit, Maria Sanchez Odogherty, José Sanchez Navarro v Crewlink Ireland Ltd* (C*168/16), and Miguel José Moreno Osacar v Ryanair Designated Activity Company, formerly Ryanair Ltd (C169/16)*, Cit., § 58.

[32] CJEU, *Heiko Koelzsch v État du Grand-Duché de Luxembourg*, Cit., § 33; *idem*, *Jan Voogsgeerd v Navimer SA*, Cit.; *idem*, *Sandra Nogueira, Victor Perez Ortega, Virginie Mauguit, Maria Sanchez Odogherty, José Sanchez Navarro v Crewlink Ireland Ltd* (C*168/16), and Miguel José Moreno Osacar v Ryanair Designated Activity Company, formerly Ryanair Ltd (C169/16)*, Cit., § 56.

the factors characterising the employee's activity[33], and the court of the habitual place of work maintains jurisdiction, even when the work is carried out in several States «(...) if it is possible, for the court seised, to determine the State with which the work has a significant connection (...)»[34]. In this interpretation, the principle of proximity emerges to help determine the concept of *habitual place of work*, extending its scope, in order to determine the place that has a more significant connection to the dispute, avoiding the proliferation of competent courts[35].

The place where the employment contract is normally performed is where the employee actually carries out his activities, which can be difficult to determine in those situations where work is carried out in several States, and it is necessary to refer to the CJEU case law to determine the applicable law. In the *Rutten* decision, the CJEU found, in a case where the employee worked in several countries, that the habitual place of work is to be interpreted as the place where the employee establishes «(...) [the] effective centre of professional activities from which an employee performs the essential part of his duties vis-à-vis his employer»[36]. In order to determine the place from which the employee fulfils the essential part of his duties vis-à-vis his employer, in that decision, the CJEU tested a set of factors that would help the judge establish that place, taking into account the circumstances of that specific case, such as: the State where the employee spends most of his working time; where his office is located; where he plan his professional activity; the place where he returns after

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[33] And restrictive interpretation of article 6(2)(b) of the Rome Convention, which determines the subsidiary application of the law of the place of business which engaged the employee is situated, if it is not possible to *lex loci laboris*: «Heiko Koelzsch v *État du Grand*-Duché de Luxembourg», *cit.*, § 47. A broad interpretation of article 6(2)(a) of the Rome Convention, and the restrictive interpretation of paragraph b of the same rule was subsequently reaffirmed by the CJEU: «Jan Voogsgeerd v. Navimer SA», *cit.*, § 35; «Anton Schlecker v. Melitta Josefa Boedeker», *cit.*, § 31.

[34] «Heiko Koelzsch v *État du Grand*-Duché de Luxembourg», *cit.*, § 43.

[35] CJEU, *Herbert Weber*, Cit., § 49; *idem*, *Petrus Wilhelmus Rutten,* Cit., § 22 and 24; *idem*, *Sandra Nogueira, Victor Perez Ortega, Virginie Mauguit, Maria Sanchez Odogherty, José Sanchez Navarro v Crewlink Ireland Ltd* (C*168/16), and Miguel José Moreno Osacar v Ryanair Designated Activity Company, formerly Ryanair Ltd (C169/16)*, Cit., § 58.

[36] «Petrus Wilhelmus Rutten v Cross Medical Ltd», case C-383/95, 09.01.1997, *CJ* 1997, I-57 f., § 27. In the previous ruling «Mulox IBC Ltd v Hendrick Geels», case C152/92, 13.07.1993, CJ 1993, I-4075 f., § 24, the CJEU stated that when work is performed in more than one State, the place where or from which the employee primarily fulfils his duties vis-à-vis his employer would be relevant. This notion has been affirmed by the CJEU in other cases: *v.g.*, «Herbert Weber v Universal Ogden Services Ltd», case C-37/00, 27.02.2002, *CJ* 2002, p. I-02013, §44; «Heiko Koelzsch v *État du Grand*-Duché de Luxembourg», *cit.*, § 39, in which the CJEU specifically analyses the conflict rule in article 6 of the RC; «Jan Voogsgeerd v Navimer SA», case C-384/10, 15.12.2001, *CJ* 2011, 00000 f., §41 also regarding article 6 of the Rome Convention.

each business trip abroad[37]. The option of using a factor-based method for determining the place of habitual performance of the employment contract was also used in the case of *Heiko Koelzch*, which concerned an employment contract related to an international transport activity. In this case, the CJEU listed as factors to consider: the place from which the employee carried out his transport tasks; from which he received instructions concerning his tasks and where his work was organised; the place where his work tools were situated; the places where transport was usually carried out; the places where the goods were loaded and unloaded; the place where the employee returned after completion of his tasks[38]. As is apparent from the cited case law, the factors to be considered vary according to the activity in question and the factors which characterise it[39]. If the employee does not have an office which can constitute the effective centre of his professional activities (in the sense of the place where the essential part of his duties vis-à-vis his employer is fulfilled), the habitual place of work will be the place where the employee has completed most of his working time, according to the *Weber* case[40] or the place where the employee carries out most of his tasks, as stated in the *Heiko Koelzch* case[41]. This factor-based method is assumed by the CJEU as able to reflect the underlying contractual legal relationship and the set of elements that characterises the place where the work is carried out, preventing «(...) a concept such as that of 'place where, or from which, the employee habitually performs his work' from being exploited or contributing to the achievement of circumvention strategies»[42].

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[37] «Petrus Wilhelmus Rutten v Cross Medical Ltd», Cit., § 27. This evidence also stemmed from the *Mulox IBC* ruling where it was suggested that the location of the employee's office in a contracting State where he had established his residence and from which he performed his work and to where he returned after each business trip should be taken into account, as a criterion for determining where the employee habitually carries out his work: «Mulox IBC Ltd v. Hendrick Geels», *cit.*, § 26.

[38] «Heiko Koelzsch v *État du Grand*-Duché de Luxembourg», *cit.*, § 49.

[39] *Idem*, *ibidem*, § 50.

[40] «Herbert Weber v Universal Ogden Services Ltd», *cit.*, § 50. It concerned an employee who worked as a cook for the same employer in several places, and the CJEU chose to give relevance to a temporal criterion based on the relative duration of periods of time spent working in the various States, is that «(…) all of an employee's term of employment must be taken into account in establishing the place where he carries out the most significant part of his work and where, in such a case, his contractual relationship with his employer is centred»: *idem*, *ibidem*, § 52. However, this temporal criterion which implies considering the entire duration of the employment relationship is dependent on the consideration of the circumstances surrounding the specific case: *idem*, *ibidem*, § 53.

[41] «Heiko Koelzsch v *État du Grand*-Duché de Luxembourg», *cit.*, § 45.

[42] CJEU, *Sandra Nogueira, Victor Perez Ortega, Virginie Mauguit, Maria Sanchez Odogherty, José Sanchez Navarro v Crewlink Ireland Ltd* (C*168/16), and Miguel José Moreno Osacar v Ryanair Designated Activity Company, formerly Ryanair Ltd (C169/16)*, Cit., § 62.

The application of the factor-based method in the present case would imply the determination of the place from which the employee carried out his transport-related tasks; received instructions concerning his tasks and organised his work; the place where his work tools were to be found; where the aircraft aboard which the work was habitually performed were stationed[43]. The CJEU refuses to connect the concept of place where the employee habitually carries out his work for the purposes of the Brussels I Regulation to the concept of the home base, pursuant to Regulation No 3922/91, since both instruments have different objectives, with the latter focusing on technical and administrative harmonisation in the safety field[44].

Nonetheless, the CJEU acknowledged that the concept of the home base would be relevant in the application of the factor-based method, in order to determine the concept of the place where the employee habitually carries out his work, seeing as the home base allows the identification of the place from which the employee carried out his work, since that concept refers to the place where the employee normally starts and ends a duty period or a series of duty periods, the place where the employee organizes his daily work, where he is at the disposal of the employer, having to reside in a place nearby for that reason, being determined by the air carrier, within the scope of its power of direction[45]. The concept of the home base would therefore be a significant indication for the determination of the place where the employee habitually carries out his work.

It should be noted, however, that the CJEU admitted that, as a result of the application of the factor-based method to the specific case being assessed by the judge, the factual elements may present closer connections with a place other than the home base, constituting this other place as the one from which employees habitually carries out his work[46].

In addition, in order to determine the place from which employees habitually carries out his work, the CJEU devalued the Member State of the nationality of the airline aircrafts[47], which seems to be a correct option because the aircraft's nationality can be easily manipulated by the airline in its favour, since, pursuant to article 17 of the *Chicago Convention on International Civil Aviation*, aircraft are nationals of the State in which they are registered. The airline can more easily manipulate the place of registration, in order to influence the acquisition of a nationality for the aircraft that is more favourable to it so, if this ele-

[43] *Idem, ibidem*, § 64.

[44] *Idem, ibidem*, § 66.

[45] *Idem, ibidem*, § 70-71.

[46] *Idem, ibidem*, § 72.

[47] *Idem, ibidem*, § 75.

ment had relevance for determining the law of the place of habitual performance of the employment contract, the employer could easily exploit this element in order to achieve a more favourable position in the resolution of labour disputes. Thus, the main objective of article 19 of the Brussels I Regulation would be unsuccessful, which is the protection of the employee as the weaker party, and the broader interpretation of the concept of place where the employee habitually carries out his work, which is the resolution of the labour dispute by a court close to the employment relationship.

4. Conclusions

In the *Crewlink* and *Ryanair* cases, the CJEU returns to the legal framework regarding international jurisdiction of the international employment contract, in two situations involving the work of crew members on board of aircrafts, which because of the large relocation they present, constitute a challenge for the interpretation of the provisions set in the Brussels I Regulation.

The first question to be answered concerned the material validity of a choice-of-court agreement established in the employment contract and which limited the jurisdiction of any disputes which could arise from that contract to the Irish courts. Having been previously agreed upon before the dispute arose, this agreement conferring jurisdiction would only be valid if it extended the list of courts to which the employee could bring proceedings in the event of a dispute with the employer, pursuant to article 21(2), which did not occur in this specific case.

In view of the invalidity of the jurisdiction clause, the second question to be answered would be the competent court to judge the dispute, and there is a doubt regarding the interpretation of article 19(1) of the Brussels I Regulation, which establishes the jurisdiction of the court as the place where the employee habitually carries out his work. The referring court questioned the CJEU whether the place where the employee habitually carries out his work could be treated in the same way as the concept of the home base set in Regulation No 3922/91.

According to the CJEU case law, the concept of *habitual place of work* must be interpreted broadly, taking into account the factors which characterise the employee's activity, maintaining the jurisdiction factor habitual place of work, even when it occurs in several States, provided that it is possible to determine to which State does the work present a more significant connection. To this end, and in situations where work is carried out in several States, as was the case in the cases analysed, the CJEU developed a factor-based method where the court uses a set of factual evidence, to be applied according to the circumstances of the specific case, in order to determine the *habitual place of work*. It was this method that the CJEU re-affirmed in the *Crewlink* and *Ryanair* cases and that

has proved to be an effective method in determining the *habitual place of work* in the more delocalised international employment contracts, such as those involved in the cases assessed. Although the CJEU refused to automatically assimilate the concept of *habitual place of work* to the home base, it considered that this would be a significant evidence of that place and, consequently, the competent international jurisdiction to resolve the dispute. In addition, in order to establish the competent court, it devalued elements which can be easily exploited by the employer to achieve a more favourable position in the resolution of labour disputes, which seems to be a consistent interpretation with the objective of protecting the weaker negotiating party within the regime of the international employment contract, established in the Brussels I Regulation.

ECOURT INNOVATION: TRANSPARENCY, COSTS AND PROCESS PENDENCY REDUCTION ENHANCING TRUST IN JUSTICE

Irene Portela[1], Miguel Matos[2]

Abstract: The Portuguese Justice Ministry has made a remarkable effort in information, communication, and transparency as far as the procedural data is concerned. Despite the profound digital reforms promoted in the last five years, the OECD reports keep indicating weaknesses in the functioning of the judicial system. The time spent to solve civil, commercial and other cases, and the rate of the unsolved cases in civil and commercial courts (per 100 inhabitants) in Portugal continues to be in the final places on the ranking of European countries. The most distressing obstacles that prevail over the final results of the process at court are their cost and duration, with effects that can be devastating. Among all the damages that may result from the delay in obtaining the result sought through the process is the deny of the effectiveness of the judicial protection. Exemption demonstrates the unacceptability of the injury suffered by the party who, even winning, cannot practically enjoy the result of the process, due to the irremediable loss of his right, resulting from the delay in the jurisdictional rendering. The TESTOR project consists of improving legal certainty, expeditious dispute resolution, costs reduction, and flow pending. The objective is to simplify the production of evidence in advance to be used for legal purposes. For that, the evidence (any type of digital document/file) is digitally signed by

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all the stakeholders (include a solicitor) and submitted to an online platform that creates a proof of evidence, stores and manages permissions access to the evidence. The material facts must be proven and this activity is crucial to establish the proof of value - the value of what is provable.

Keywords: proof of evidence, archive, digital signatures

1. Introduction

The Portuguese Justice Ministry with a presentation of the "Plano de Ação Justiça + Próxima" [Plane of Action + Close Justice] wants to mark the founding moment of the changes that the Government intends to introduce in the area of justice[3] .

Article 38, number 1, of the Decree-Law No. 76-A/2006, of 29 March, comes to assign responsibilities to solicitors performing "simple recognition and special mentions, in person and by similarity, authenticate private documents and certify translations of documents pursuant to notarial law." The same article, under number 2, confers probative force to acts of recognition, endorsements, and certifications held by solicitors, since, as explained in article 38 number 3, is carried out by registration in the computer system[4].

In this context, the Ordem dos Solicitadores e dos Agentes de Execução (OSAE) - the Portuguese Chamber of Solicitors -, has developed an application of "Online Register of Solicitors" called ROAS[5] , which allows these professionals, the registration of acts of recognition, authentication and certification, through platform authentication for a user/password authentication mechanism assigned by the Chamber of Solicitors.

The legality and certification of documents deposited in the ROAS are ensured by the use of paper-based Authentication seals sticker (vignettes/number of vignette), which are issued to each solicitor and sent to the solicitor's professional domicile, by registered letter.

In accordance with the provisions of the "Regulamento de Publicidade e Imagem dos Solicitadores e Agentes de Execução" (Regulation 786/2010), the

[3] MINISTÉRIO DA JUSTIÇA, Plano de Ação + Justiça. https://publicacoes.mj.pt/. [Online; accessed 2-May-2018].

[4] Decreto Lei nº 76-A/2006, Diário da República nº 63/2006, 1º Suplemento, Série I-A, de 2006-03-29.

[5] https://www.solicitador.org/roas2/login.jsp

authentication of documents composed of more than one page, is performed using a single seal, placed on a staple that unites the pages in the document. In the authentication process, the solicitor must also sign or initial the seal, putting the date on which the signing or initialing was affixed. This procedure turns "private" document in a "particular authenticated" document, but does not have the force of "public document" as for example with the notarial deed. The document signed by solicitor/lawyer can be fraudulently altered, that is, without the consent of its author or the parties involved (in the case of legal transactions) are here concerned the values of authenticity, integrity, and non-repudiation. On the other hand, there is the possibility of the document being destroyed or damaged and this possibility increases over time, and can also have a corrosive effect and an irreparable damage in its form and content. The digital information is presented in a number of formats, mapped into binary code in computer storage media, and their access and preservation places to the new "curators" of contracts/wills/statements for future memory, the challenge of "irreversibility and their incorruption". This information, encrypted, secure and verifiable comes to convert the action of Solicitors and agents of enforcement to authenticators agents, and plenipotentiaries certifiers of the powers that the legislature assigned to them, the role of real justice auxiliaries. The main objective of TESTOR[6] is to provide a proof of evidence for any type of digital document which can be legally accepted and indisputable. The digital document is stored on an online platform with access restrictions, working TESTOR as a trusted archive service. In this paper it is discussed the proof of concept, the related work and presented the project.

2. Proof of Concept

This proof of concept is to build and develop the prototype with the use of information and communication technologies (ICTs) from an online registration platform digital documents with probative legal value, to be in the future managed by the OSAE – Order of the Solicitors in the eJustice System, within the civil procedure law judicial cases or in a vast "digital data certification" with all the security and privacy data warranties, and in respect with the constitutional and human rights.

Research impact relates to the successful application of the idea and its recognition by qualified end-users (OSAE, Judges and Courts and other stakeholders). The eJustice Community (the Lawyer Order, the Justice Ministry, the citizens) engagement will be important for the validation of this proof of concept's quality and impact. Because of its position at this applied end of the re-

[6] Project co-financed by PORTUGAL 2020, TESTOR - The production and simplification of evidence SAICT-POL/26167/2016.

search spectrum, proof of concept is an intermediate measure of the conversion rate of ideas into a set of "Justice and legal services". It provides immediate feedback on the Justice service (Courts, Judges, lawyers, solicitors, citizens).

The adding value of this project is:

- Relative value, in the case of an authenticated private document;
- Absolute value, in the case of a document that is full proof;
- Admitting all kinds of digital files - regardless of its format and its content (the existing platform only allows the registration of documents in PDF format with a maximum size of two megabits).

Respecting four functional prerogatives:

1 Originality/ authoring/authenticity of the document in its origin: answering the question, who is the author of this document?

2 The continuation or document eternity in conditions that allows their use or access. The passage of time on the document without it perishes, spoil, disappear or become unreadable;

3 The document size - although the document can be compressed, regardless of size can be stored on the platform;

4 Document security to prevent their appropriation - or access to them without an electronic key preventing any violation of preventing any violation of correspondence or professional or trade secret.

The main results expected from the project are:

1 The implementation of the project provides valuable contributions to the scientific and technological knowledge. In addition to scientific publications and conferences on changes in justice and evidence, are considered important technological results because they concern the production of evidence (judicial or non-judicial) to obtain a resistible unshakeable proof to time and incorruptibility and integrity. Publications and resul-

ting articles are the first inputs par excellence of a project of this nature. Consisting of a measure of e-Justice framed a resource rationalization logic (effectiveness/efficiency and economy) there are several aspects related to costs/risks and time to perform tasks that are relevant to the study and should be underlined. The promotion and promoting science and technology also result in knowledge sharing and training for the entire universe of solicitors and Enforcement Agents members OSAE. Research quality includes intrinsic merit and academic impact. Academic impact includes peer recognition and the impact of the research on the same or related discipline area. The prototype will differ from the creation of the final product "the platform TESTOR" because the materials that will be used in the final product may be expensive, and fabrication processes will change;

2 The production of a prototype to be used by the Solicitor OSAE eJustice system in Portugal through or as a recommendation of OSAE, demonstrating that we can effectively reduce the backlog and to expedite the processes involving the justice sector. The results of the application of the prototype will be very important to enable the transparency and reduce the costs of proceedings. Portuguese law officers must adopt a new way of working quickly - more or at least using more resistant to erosion means of procedural dilatory incidents. Solicitors and bailiffs may be the first impetus to the simplification and redefinition of legal certainty around the production of evidence. In the first instance, as the main users of this system of open doors to the "deposits, records and documents of deposits encrypted" no limit on their shape, size or support. On the other hand, any citizen may request a "certificate/self-realization" at very small price to use for any purpose to make sure that the value of the legal security is guaranteed and absolutely incorruptible.

The OECD study about the cost of Justice show "well-functioning judiciaries are a crucial determinant of economic performance". Judicial systems serve important purposes in up-holding social values but also in determining economic performance. Well functioning judiciaries guarantee the security of property rights and enforcement of contracts. Security of property rights strengthens incentives to save and invest, by protecting returns from these activities. A good enforcement of contracts stimulates agents to enter into economic relationships, by dissuading opportunistic behaviour and reducing transaction costs. This has a positive impact on growth through various channels: it promotes competition,

fosters specialization in more innovative industries, contributes to the development of financial and credit markets and facilitates firm growth[7].

The vision for the project "Testor - simplified proof production" is eminently practical, useful to the country, whose job is on the one hand, simplify, providing security, speed, prevent and avoid legal conflicts. On the other hand, revive the economy, giving credit / reliability, protection of commercial, industrial and guarantees for consumer goods and online services, efficiency and effectiveness in fulfilling negotiation / contract, national and international obligations, to prevent improper conduct by the network (www), protect the relationships of fair competition, prevent counterfeiting of products, works, misappropriation of content, plagiarism. Building trust in trade relations, through the possibility of ensuring compliance with the quality criteria, deadlines, technical and scientific characteristics, conservation, etc., contribute to increase exports, reduce conflicts, create new levels of confidence and bring considerable benefits to the Portuguese payments balance. At the internal level, the possibility of having an expedient means, almost free, to ensure the fulfillment of obligations assumed because it is the proof that shows without doubt (or very little doubt where the truth of the facts) that the seller or provider of service (or buyer) is liable, will give a confidence boost to consumption and deterrent to fraud or counterfeiting. Safety on trade and commercial relations, guaranteed by this instrument of "compulsion to fulfill" (because the facts are revealed) is a value-creating source for the Portuguese economy. In an environment wherein 2015 there was a rate of 207.8% of cases pending in the Portuguese courts, this will be a cleaning tool for many processes that are clogging up the eJustice system in the strict sense.

As for the scientific merit of the research team, members' qualifications are more than sufficient to adequately carry out the proposed project. To note that University researchers do not only compose the team, but OSAE members are also on the team and will be part of the implementation of the final product (not only the prototype). We do not allow us to be victims of some gap between the prototype and the final product – we have to do an applied research in the real world with the real persons who need this, the platform "TESTOR".

[7] OECD. "OECD Economic Surveys". 35.

3. Related Work

Digital document certification services are an enabler of e-Government and are present in some countries e.g. Hungary [8] and Estonia[9]. These services make use of digital signatures and require a public key infrastructure for digitally sign files/documents, working as an e-Notary. Although electronic notarizations have been legally available in many states for more than a decade, the state of Virginia (USA) expanded electronic notarizations to allow their notaries to also legally perform remotely based notarizations through a secure webcam session[10]. Allowing notaries to be able to electronically notarize documents from virtually anywhere at any time.

On TESTOR project is allowed not only certify documents (as a notary) but also follow and connect the proof, that can be audio, video or any other digital content, with the civil process. The aggregation of the document with a time stamp is a core functionality and the timestamp needs to be preserved for an undetermined long time.

4. Project

The scope and objectives of "TESTOR, for the production and simplification of evidence" are the design and the development of a digital prototype about the e-Justice vision and management of the rules and legal principles that govern the proof of facts in a legal proceeding (a civil procedure) or as a digital document, out the civil law procedure. The proposed project is relevant and has originality. It aims to demonstrate to internal stakeholders (at the strategic level of management, operational and technical – the OSAE Solicitor Order and the Courts, in particular, the Judges) and external (at the level of prevention and prophylaxis cost reduction, legal certainty, expeditious dispute resolution and flow pending) that the Portuguese justice system has the ability to improve "substantially" considering the implementation of the various attempts at reforms that they have failed – we can see the PORDATA statistics 208% of pen-

[8] KISS, P. J., KISS, J. K., and KLIMKÓ, G."Electronic document certification service: An enabler of e-government uptake in hungary", in *International Conference on Electronic Government and the Information Systems Perspective 2016*, Springer, pp. 276–286.

[9] ERIK. Estonia e-Notary. http://www.rik.ee/en/other-services/e-notary, 2018. [Online; accessed 24-April-2018].

[10] SECRETARY OF THE COMMONWEALTH KELLY THOMASSON, Virginia Electronic Notary. https://commonwealth.virginia.gov/official-documents/notary-commissions/enotary/. [Online; accessed 27-April-2018].

ding process at Portuguese Courts. One the other hand, the view that an e-justice system feeds on digital technology of last generation (ICT) programmed with "eminently electronic ratio of legislation" is not easy.

The state sector and public administration (PA) have been in the last 30 years, stressed by reforms based on assumptions of the model of New Public Management (NPM), whose fundamental elements were characterized by Hood[11]: professional management; focus on performance measures, focusing on results and accountability for results - accountability; organizational decentralization, competition among agencies; adoption of business management styles; increased levels of efficiency, effectiveness and economy; and the "insistence on doing more with less money"[12]. More than ever there is talk of the justice system crisis and the need for a new approach to the management of the same. In particular, it called for the introduction of managerial models that aim to promote, not only for users of the courts, citizens and businesses, but also with the own economy and society, an increase in quality, efficiency, effectiveness and accountability[13].

It is observable that information systems have a direct impact on the management of the justice system, and therefore the administration and access to justice by citizens and organizations:

1 The implementation of office automation systems and process management;

2 Applications to support the activity of judges and prosecutors;

3 Video conferencing and other technologies used in the courtrooms;

4 The integration of various national or systems interoperability among different cross-border systems.

In the eJustice study context there are areas or categories "sensitive" that have the effect of promoting mimicry through benchmarking, aligning strategi-

[11] HOOD, C., "The 'new public management' in the 1980s: Variations on a theme"., *Accounting, Organizations and Society,* 20, 2-3 (1995), 93–109.

[12] ROCHA, J., "Quadro geral da evolução da gestão de recursos humanos na administração pública", (2005),10. http://hdl.handle.net/1822/2902. [Online; accessed 24-April-2018].

[13] BILHIM, J., "A construção da função qualidade nos tribunais portugueses: uma abordagem à luz da teoria institucional", *Scientia Jurídica ,315* (2008), 517–540.

cally the various justice agencies and the counties of management bodies, creating the possibility to be a network of "best practice" in various public institutions with better performance indices. For example, in "eJustice system" there would be a report on the performance of services as in the United States, increasing transparency and accountability of managers to the citizens, and the Mayors follow this practice with communication and publication of reports with the expense local public as in the UK with the council tax that is updated depending on the expense blaming all the inhabitants.

When we use the term ejustice we use it –in a broad sense with a lot of actors (in or out the courtrooms):

1. Notarial Acts and Records Endorsements: Central Registry
2. Notary Public;
3. Central Registry- certification;
4. All contracts;
5. Document attestation;
6. Processes:
    - Appeal, completed and pending: Polícia Judiciária (PJ) [Judiciary Police];
    - Appeal, completed and pending: Polícia Segurança Pública (PSP) [Public Police];
    - Appeal, completed and pending: Tribunal Judicial (TJ) [Court of Law];
    - Investigation procedures: Ministério Público (MP) [Public Ministry]
7. Judicial network, courts;
8. Human Resources;
9. Lawyers/Solicitors;

10 Persons employed in Courts;

11 Magistrates;

12 Persons employed in the police;

13 Enforcement Agents.

The Judicial organizations see ICT as a guarantee of effectiveness and efficiency of the justice system, investing in this type of information infrastructure [14] as data shows a different reality. The PORDATA statistic – pending process with the judge, with lawyer, at the court – "Portuguese congestion rate": ratio of pending and completed cases in 2015[15] took five or ten years to dictate a sentence, or to have a judgment. The actual platform (ROAS) is not functional at this moment, because it's impossible to store digital documents and metadata ensuring levels of scalability, reliability and availability of "evidence" in the system.

In a civil action, the requisite degree of proof is a preponderance of the evidence. The plaintiff must show that more probably than not the defendant violated his or her rights. However, each alleged fact must be proved separately, as must all the facts necessary to reach a judgment for the plaintiff (the person filing a lawsuit) or for the prosecution (the "people" or "state" represented by the prosecutor). The defendants in both civil suits and criminal trials need not provide absolute "proof" of non-responsibility, since the burden is on the plaintiff.

An adequate evidence, adequate proof legally presented at trial, or not, fulfilling a legal responsibility is a sufficient corroboration.

4.1 Architecture

The trier of fact, whether a judge must review the evidence presented, evaluate it, and determine if it meets the standard of proof. The weight of evidence is based on the believability or persuasiveness of evidence. As figure 1

[14] CONTINI, F., and Cordella, A., "Information System and Information Infrastructure Deployment: The Challenge of the Italian E-Justice Approach", Draft. 43–52
VELICOGNA, M. "Justice systems and ICT-What can be learned from Europe". Utrecht L. Rev. 3 (2007), 129.
VELICOGNA, M., and CONTINI, F., *Assemblage-in-the-making: Developing the e-services for the Justice of the Peace Office in Italy.* Springer, 2009.

[15] www.pordata.pt

describes, paper documents should be scanned. Using a smartcard (Citizen's Card), the solicitor digitally signs the document. Any documents in digital format, including videos, may be signed. The documents received by the platform, which are accompanied by descriptive metadata, are re-signed (with a time stamp) by the platform itself. After the signature procedure, the documents (the original and the signed by the platform) and their metadata are stored in a database. The Solicitor, as well as other entities of the judicial system (who are granted access to the document), may access the metadata and its documents through a web interface. Interfaces may also be created for connection to other information systems.

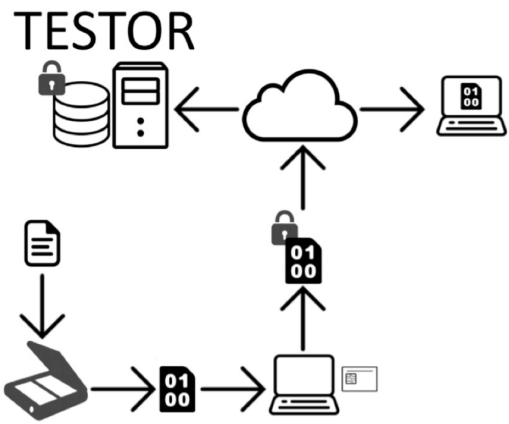

Fig.1. *System Architecture*

TESTOR will make use of: smartcards, for stakeholders sign digital documents; digital signatures, the online platform TESTOR signs each submited digital document; and an external service for a long term validation signature which includes the timestamp. The signature with smartcard also may be done with the portuguese public service Chave Móvel Digital (CMD)[16], this service allows the signer to not have the smartcard when performing a signature, CMD needs a previous adhesion where the smartcard is registered and when a signature is needed a message with a secure token in sent via SMS that is needed to sign the document on CMD service.

[16] AUTENTICAÇÃO.GOV, Chave móvel digital. https://www.autenticacao.gov.pt/a-chave-movel-digital, 2018. [Online; accessed 24-April-2018].

5. Future Work

The vision for the project TESTOR is eminently practical and aims to simplify procedures, providing transparence, security, speed, prevent and avoid legal disputes in court.

The TESTOR prototype will be used in a proof of concept. We hope that this project will generate new opportunities for social and professional applications in the field, with significant consequences in the economy, in the e-Justice and finance.

The OSAE is committed to ensuring the full exploitation of the prototype as a public service, a service of e-Justice, innovative and with a professional and social focus.

The e-Justice system of OSAE in Portugal will be a pioneer, and its use will be the basis for a new phase of the justice.

The law in the 21st century: a Sisyphean struggle to keep up with technological evolutions?

J. De Bruyne[1] & C. Vanleenhove[2]

Abstract: Society has changed tremendously in the last decade. It still is in a transitional phase because of different technological developments. These evolutions affect our way of thinking, doing business, communicating, interaction and the work/life balance. Some argue that the legal framework will need a fundamental make-over as well. The question that arises is whether some of the existing long-standing legal principles are compatible with technological evolutions or whether new legislation will need to be adopted. The article will try to provide an answer to these fundamental issues through a case-study of recent evolutions in two different fields of law, namely the use of social media in court proceedings for procedural law and the introduction of self-driving cars in traffic for liability law.

Keywords: Law and Technology – Service of Process – Social Media – Self-Driving Cars

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Summary: The article examines whether existing legal principles are compatible with technological evolutions or whether new legislation will need to be implemented. We will examine two evolutions more thoroughly, namely the use of social media for service of process and the commercialisation of autonomous vehicles. A new phenomenon has arisen in a number of common law jurisdictions around the world. In Australia, the United States, New Zealand, Canada and England there are examples of cases in which social media platforms were used to notify the defendant of the commencement of civil proceedings (this is called service of process). In civil law nations, effecting service of process through social media is completely unknown. This is remarkable in light of the obvious importance of this topic for the continental EU Member States, given the digital reality and the continuous objective to increase the functionality of dispute resolution. Although it is difficult to predict whether the legislator in civil law countries will endorse social media service, it is argued that social media service could be valuable as an additional method in Belgium when the defendant does not have a known address in order to strengthen the likelihood of actual notice. Another technological evolution relates to the commercialisation of autonomous vehicles. The increased use of self-driving cars has several benefits. However, legal challenges will come to the surface as well. One of these relates to the question who should be held liable for damage caused by autonomous vehicles. At the present time, things are quite clear. The manufacturer of (parts of) the vehicle or its driver can in most cases be held liable under national or supranational law for the damage caused by the accident. The article will show that things are more complex with self-driving cars and that the existing legal framework might need some changes.

1. Introduction

Society has changed tremendously in the last decade. It still is in a transitional phase because of different technological developments. These evolutions affect our way of thinking, doing business, communicating, interaction and the work/life balance. It is, therefore, not surprising that several aspects related to those technological evolutions are increasingly being studied in academia[3] and

[3] See in general: BROWNSWORD, Roger, SCOTFORD, Eloise & YEUNG, Karen, *The Oxford Handbook of Law, Regulation and Technology*, 1st ed., Oxford, Oxford University Press, 2017; CALO, Ryan, FROOMKIN, Michael & KERR, Ian, *Robot Law*, 1st ed., Cheltenham, Edward Elgar Publishing, 2016.

addressed by policymakers.[4] The question that arises from a legal point of view is whether some of the existing long-standing legal principles are compatible with technological evolutions or whether new legislation will need to be adopted. In this regard, it is often argued that the law lags behind technological development.[5] Technological evolutions may expose gaps in the existing legal framework or may give rise to undesirable conflicts and call for changes.[6] We will try to provide an answer to these fundamental issues through a case-study of recent evolutions in two different fields of law, namely the use of social media for notice of court proceedings in the area of procedural law (part 2) and the introduction of self-driving cars (SDCs) or autonomous vehicles in the area of liability law (part 3). We will conclude by giving some (general) recommendations that can be taken into account by policymakers, judges and lawyers when creating or applying the law in the "society of tomorrow" (part 4).

2. The Use of Social Media in Service of Process

After some preliminary considerations on the use of social media in services of process (part 2.1), we will describe the current common law trend of effecting service of process through social networking sites (part 2.2). We then give a short overview of how service of process is effectuated in Belgium, as an example of a civil law country (part. 2.3). Finally, having taken note of the service of process framework in Belgium and the absence of social media as a form of acceptable notice, we reflect on the possible introduction of such service within that jurisdiction (part 2.4).

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[4] Reference can be made to the working of the EU High Level Group GEAR 2030. The Group discussed the main challenges for the automobile industry in the next fifteen years and made recommendations to ensure that the relevant policy, legal and public support framework is in place for the roll-out of highly automated and connected vehicles by 2030 (High Level Group on the Competitiveness and Sustainable Growth of the Automotive Industry in the European Union (GEAR 2030), "Ensuring that Europe has the most competitive, innovative and sustainable automotive industry of the 2030s and beyond", October 2017). The European Parliament has also adopted a resolution on the 16th of February 2017 with recommendations to the Commission on civil law rules on robotics (European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103INL)).

[5] See for example: MOSES, Bennett, "Agents of Change: How the Law "Copes" with Technological Change", *Griffith Law Review*, no. 20, 2011, 763-794, 764; MARCHANT, Gary, ALLENBY, Braden & HERKERT, Joseph, *The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight*: *The Pacing Problem*, 1st ed., New York, Springer Science & Business Media, 2011.

[6] LEENES, Ronald *et al*, "Regulatory challenges of robotics: some guidelines", *Law, Innovation and Technology*, vol. 9, no. 1, 2017, 1-44, 7.

2.1. Preliminary Considerations

Imagine you open the Facebook Messenger app and you see the new message notification. It is a message informing you that you have been sued and that you are to appear in court as defendant in a family law case involving proof of paternity. Or: you are browsing through Instagram when you suddenly receive a DM (Direct Message). There is a lawsuit pending against you. You have been served in an insurance matter through the DM. Or: you often use LinkedIn to keep track of your contacts' occupations and achievements. One day your LinkedIn inbox indicates that you have a new message. The LinkedIn message contains a summons and a claim form. A foreign company is taking you to court for trademark infringement. Futuristic scenarios? Think again! These situations have actually taken place in the last decade in Australia[7], Canada[8] and the United States[9] respectively.

In a number of common law jurisdictions around the world courts have allowed plaintiffs to notify the defendant of the commencement of legal proceedings (*i.e.* service of process) through the use of social networking platforms. The list of social media is long but the ones most often used for service of process are Facebook, Twitter, LinkedIn and Instagram. When mentioning this relatively recent line of private law cases to lawyers with civil law backgrounds, reactions ranging from mild amused surprise to utter shock and disgust can be observed. In civil law nations effecting service of process through social media is completely unknown.[10] Whereas the use of e-mail for service purposes seems to have become increasingly more well established, the use of social media as an avenue for notification of the commencement of proceedings appears to be in a whole different ballpark. As such, scholars in continental EU Member States (by which we refer to those EU countries that belong to the civil law tradition) have not yet addressed this relatively new development within the common law world. This is unfortunate as getting insight into the practice might prove valuable for enhancing our own service rules. This contribution, therefore, undertakes an analysis

[7] Federal Magistrates Court of Australia, Byrne & Howard, 21 April 2010, [2010] FMCAfam 509.

[8] A report of the case is available here: ROBINSON, Alex, Toronto lawyer serves claim with Instagram, 2 February 2018, http://www.canadianlawyermag.com/legalfeeds/author/alex-robinson/toronto-lawyer-serves-claim-with-instagram-15294/, read on 2 May 2018.

[9] United States District Court, Eastern District of Virginia, Alexandria Division, WhosHere, Inc. v. Gokhan Orun, 20 February 2014, 2014 WL 670817.

[10] There is, to our knowledge, only one example where social media were used in the transmission of judicial documents. In order to initiate Dutch court proceedings Stichting BREIN (Bescherming Rechten Entertainment Industrie Nederland) served the Pirate Bay (a website registered in Sweden) through Twitter and Facebook, in addition to the conventional methods of service (Rechtbank Amsterdam, 30 July 2009, no. 428212 / KG ZA 09-1092 WT/RV).

of the reported cases to subsequently contemplate on a general level whether social media service will ever form part of the service methods on the EU continent.

2.2. Social Media Service in Common Law: State of Play

As mentioned, common law countries are the laboratory in which service through social media platforms has been allowed to flourish. After a brief discussion of the origin of the use of social media in service of process (part A), we will examine the conditions laid down by the case law more thoroughly (part B).

A. Origin

The actual cradle of social media service is to be situated in Australia (at least judging by the reported cases). The ball begun rolling with a case between a mortgage provider and a couple that no longer made its repayments.[11] In *MKM v. Corbo & Poyser* the defendants had taken out a home refinancing loan with MKM Capital but had failed to keep up with payments. They not respond to e-mails from MKM's attorneys and did not appear in court. MKM obtained a default judgment permitting seisure of the property. Before the judgment could be executed it had to be served on the defendants. However, defendants had moved away, had switched jobs and had changed their phone numbers. Repeated efforts at personal service as well as service by mail and publication did not lead to the desired result. MKM therefore made the ground-breaking move of seeking permission to effect service through the defendants' Facebook accounts. The lawyers had handily located both defendants on the biggest social networking site. To that end they used the personal information the couple had supplied themselves during the loan application process. They were able to link the defendants' date of birth and their e-mail addresses to the Facebook profiles (which were, fortunately for the plaintiff, not protected by stringent privacy settings). Furthermore, they found that both defendants were friends on Facebook. Master Harper of the Supreme Court of the Australian Capital Territory therefore gave plaintiff MKM the green light to inform defendants of the entry and terms of the default judgment via a private Facebook message. In addition, the order had to be served via e-mail and by leaving a sealed copy at their last known address.

Although the germ of social media service lies Down Under, the current centre of gravity for this rather contentious method of service has arguably

[11] Supreme Court of the Australian Capital Territory, MKM Capital Pty Ltd. v. Corbo & Poyser, 16 December 2008, case no. SC 608, text on file with the authors.

shifted to the United States. The first approval by an American court came in the case of *Jessica Mpafe v. Clarence Mpafe*.[12] A wife wished to divorce her husband but it was believed he had left the territory of the United States.[13] She had a suspicion that he had moved back to Ivory Coast. As she had no physical address for her soon-to-be ex-husband, she petitioned the court for approval to send notice by general delivery, where the post office holds mail until the recipient comes to the post office to pick it up.[14] Judge Kevin S. Burke noted: "*While the Court considered publication in a legal newspaper, it is unlikely that Respondent would ever see this. It is more likely that Respondent could receive notice on the internet. The traditional way to get service by publication is antiquated and is prohibitively expensive. Service is critical, and technology provides a cheaper and hopefully more effective way of finding Respondent.*"[15] The judge is further quoted as stating that: "*Nobody, particularly poor people, is going to look at the legal newspaper to notice that their spouse wants to get divorced.*"[16] He ordered service to include, but not be limited to, contact via any Facebook, Myspace, or other social networking site, contact via e-mail and contact through information that would appear through an internet search engine such as Google.[17]

B. Conditions

State court litigation is governed by state law provisions whereas the Federal Rules of Civil Procedure (FRCP) determine the service regime for federal cases. For domestic service Rule 4(e)(1) FRCP refers to state provisions as it permits following state law for serving a summons in an action brought in courts of general jurisdiction in the state where the district court is located or where service is made. Under state law more unconventional methods of service are

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[12] Fourth District Family Court of Minnesota (Hennepin County), Jessica Mpafe v. Clarence Mpafe, 10 May 2011, No. 27-FA-11-3453.

[13] VAN HORN, Hans, "Evolutionary Pull, Practical Difficulties, and Ethical Boundaries: Using Facebook to Serve Process on International Defendants", *Global Business & Development Law Journal*, vol. 26, 2013, 555-576, 566; EISENBERG, Alyssa, "Keep Your Facebook Friends Close and Your Process Server Closer: The Expansion of Social Media Service of Process to Cases Involving Domestic Defendants", *San Diego Law Review*, vol. 51, 2014, 779-822, 790.

[14] WARD, Stephanie, "Our Pleasure to Serve You: More Lawyers Look to Social Networking Sites to Notify Defendants", *American Bar Association Journal*, vol. 97, no. 10, 2011, 14-16, 14.

[15] Fourth District Family Court of Minnesota (Hennepin County), Jessica Mpafe v. Clarence Mpafe, 10 May 2011, No. 27-FA-11-3453.

[16] WARD, Stephanie, "Our Pleasure to Serve You: More Lawyers Look to Social Networking Sites to Notify Defendants", *American Bar Association Journal*, vol. 97, no. 10, 2011, 14.

[17] Fourth District Family Court of Minnesota (Hennepin County), Jessica Mpafe v. Clarence Mpafe, 10 May 2011, No. 27-FA-11-3453.

available in comparison to the federal rules. In some states catch-all provisions are in place. §308(5) of the New York Civil Practice Law and Rules (N.Y. CPLR), for instance, states that the court may order service in any manner, if the other (traditional) methods of service provided by § 308 N.Y. CPLR are impracticable. Impracticability however "*does not require proof of due diligence or of actual prior attempts to serve a party under the other provisions of the statute*".[18] For service abroad, Rule 4(f)(3) FRCP gives the judge the possibility to order any method he deems appropriate, as long as the method is not prohibited by international agreement. The provision offers this option without any need for the plaintiff to first attempt service via the other methods listed in Rule 4(f) FRCP.[19]

A scrutiny of the available cases reveals that the majority of courts have approved of social media service in combination with another form of service. In *Mpafe v. Mpafe*, for example, service through social networking platforms was ordered together with *inter alia* e-mail service.[20] In *Ferrarese v. Shaw* plaintiff begun proceedings against his ex-wife who had disappeared with their daughter. The woman remained elusive and could not be served. The federal court decided that service on the ex-wife should be effected via e-mail, Facebook message and certified mail on defendant's last known address and on defendant's sister.[21] In *Federal Trade Commission v. PCCare247 Inc.* the Federal Trade Commission brought suit against five foreign defendants who were involved in a fraudulent organisation trying to extract money from American citizens by deceiving them into believing that their computers were infected. On the basis of Rule 4(f)(3) FRCP the New York District Court granted the FTC's request for permission to serve documents on the defendants via e-mail and Facebook.[22] The Family Court decision in *Noel Biscocho v. Anna Maria Antigua* is an excellent example of the judicial hesitance to completely step away from traditional methods of service in favour of the newly discovered service channel offered by social media. A father who was seeking to modify an order of child support for his son based on the alleged emancipation of the boy was allowed to serve the mother via Facebook. However, he also had to follow up with a mailing of the summons and the

[18] District Court for the Southern District of New York, Fortunato v. Chase Bank, 7 June 2012, 2012 WL 2086950; District Court for the Southern District of New York, S.E.C. v. HGI, Inc., 8 November 1999, 99 Civ. 3866, 1999 WL 1021087.

[19] United States Court of Appeals, Ninth Circuit, Rio Properties, Inc. v. Rio International Interlink, 20 March 2002, 284 F.3d, 1007, at 1015.

[20] Fourth District Family Court of Minnesota (Hennepin County), Jessica Mpafe v. Clarence Mpafe, 10 May 2011, No. 27-FA-11-3453.

[21] United States District Court, Eastern District of New York, Giovanni Ferrarese v. Vinda Shaw, 19 January 2016, 164 F.Supp.3d 361 (2016).

[22] District Court for the Southern District of New York, FTC v. PCCare247 Inc., 7 March 2013, 2013 WL 841037.

petition to the mother's last known address, even though the court recognised that prior service at that address had been unsuccessful (the mother had moved without leaving a forwarding address) and her physical whereabouts uncertain.[23]

This cautious attitude is, however, not shared by all courts. *Baidoo v. Blood-Dzraku* appears to be the first reported case in which the court approved service by Facebook message as the sole method of service. The plaintiff was a married woman who wanted to divorce her husband. She had no physical address for him and he could not be served in person. Therefore, the wife petitioned the court for service via Facebook. The court did not require service via publication as a backup method to Facebook, deeming the former to be "*essentially statutorily authorized non-service*".[24] Similarly, in *St. Francis Assisi v. Kuwait Finance House* the matter to be decided was whether the plaintiff was entitled to damages from a number of defendants in connection with the financing of terrorist organisation ISIS and the subsequent slaying of Assyrian Christians in Iraq and Syria. The plaintiff attempted to serve one of the defendants, a Kuwaiti-born Salafi sheikh, but came up empty. It, therefore, turned to the United States District Court for the Northern District of California, seeking permission to effect service via Twitter, the American social networking platform used by the defendant to collect money to fund terrorist activities. The court agreed with service through Twitter as the only method to be used.[25]

The available case law tends to impose two requirements regarding the social media account to be served. First, the plaintiff has to provide the court with evidence that the account actually belongs to the defendant (authentication requirement). Second, the plaintiff needs to demonstrate that the defendant makes regular use of his account (evidence of use requirement). Both are logical conditions given the fact that the Due Process Clause of the Fourteenth Amendment to the U.S. Constitution imposes that notice should be "*reasonably calculated, under all circumstances, to apprise interested parties of the pendency of the action and afford them an opportunity to present their objections*".[26]

In *Baidoo v. Blood-Dzraku* the plaintiff was aided by the existence of conversations between her and her husband on Facebook. She submitted an affidavit

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[23] Family Court of the State of New York (County of Richmond), Noel B. v. Anna Maria A., 12 September 2014, case no. F00787-13/14B, 2014 N.Y. Misc. LEXIS 4708; COLEMAN, Kristina, "Beyond *Baidoo v. Blood-Dzraku:* Service of Process Through Facebook and Other Social Media Platforms Through an Indiana Lens", *Indiana Law Review*, vol. 50, 2017, 645-671, 660.

[24] Supreme Court of New York County, Baidoo v. Blood-Dzraku, 27 March 2015, 48 Misc 3d 316.

[25] United States District Court for the Northern District of California, St. Francis Assisi v. Kuwait Finance House, et al., 30 September 2016, 2016 WL 5725002.

[26] U.S. Supreme Court, Mullane v. Central Hanover Bank & Trust Co., 24 April 1950, 339 U.S. 314 (1950).

to which she annexed copies of the exchanges between her and the defendant on Facebook and in which she identified the defendant as the subject of the photographs on the Facebook page in question. While such statements do not constitute absolute proof, the court was satisfied that the account did belong to the untraceable defendant. As to evidence of regular use, the court was equally satisfied as the exchanges between the plaintiff and the defendant indicated that the latter regularly logged into his account, countering the risk of him not seeing the summons until the time to respond had passed.[27] Conversely, in *Fortunato v. Chase Bank* the defendant wanted to bring the plaintiff's daughter into the litigation. The request for service through the Facebook account of the daughter was denied for reasons of uncertainty regarding the authenticity of said account. The court argued that: "*anyone can make a Facebook profile using real, fake, or incomplete information, and thus, there is no way for the Court to confirm whether the Nicole Fortunato the investigator found is in fact the third-party defendant to be served*."[28]

2.3. Short Overview of Service of Process in Belgium

In Belgium civil proceedings are initiated either by a writ of summons or by means of a petition. The most common method is the delivery of the writ of summons to the defendant by the bailiff.[29] The Belgian Judicial Code lists a number of methods to effect this service of process (art. 33 *et seq*.). The bailiff will respect a certain order and will try to serve the defendant in person first. Service in person means that the bailiff hand delivers the writ of summons to the defendant. It can take place wherever the defendant can be found. If the defendant refuses to accept service, this refusal will not prevent service in person from being accomplished. The bailiff makes a note of this refusal on the writ.[30]

If service in person is not possible, service can be effected at the domicile or, in absence of a domicile, the place of residence of the defendant, by leaving a copy of the writ with a relative, servant or agent, provided that the person is 16 years old or above.[31] If the previous method of service is not possible, the bailiff

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[27] Supreme Court of New York County, Baidoo v. Blood-Dzraku, 27 March 2015, 48 Misc 3d 314-315.

[28] District Court for the Southern District of New York, Fortunato v. Chase Bank, 7 June 2012, 2012 WL 2086950.

[29] TAELMAN, Piet & VAN SEVEREN, Claudia, *Civil procedure in Belgium*, 1st ed., Mechelen, Wolters Kluwer, 2018, 89.

[30] Art. 33 Belgian Judicial Code.

[31] Art. 35 Belgian Judicial Code.

can leave a copy of the writ in a sealed envelope at the domicile or, in absence of a domicile, the place of residence of the defendant. The next business day at the latest the bailiff will send a letter to the defendant via registered mail, informing him of the date and time of the bailiff's visit and of the possibility to obtain a copy of the writ at the bailiff's office during a period of three months.[32] The sending of the registered letter is a precautionary measure, without any effect on the service.[33]

Since 31 December 2016, the date of the entry into force of the so-called Potpourri III Act of 4 May 2016, the possibility for the bailiff exists to serve through e-mail. In civil matters the bailiff may choose the method of service (personal service or electronic service via e-mail) depending on the circumstances specific to the case.[34]

The bailiff can either use the "gerechtelijk elektronisch adres" (a unique e-mail address, issued by the government[35]) of the defendant or, for people who do not have such an address, the "adres van elektronische woonstkeuze" (a regular e-mail address, not issued by the government)[36]. In the latter case explicit consent needs to be obtained from the defendant each time the bailiff wishes to serve him through that e-mail address.[37] To that end the bailiff will send a request for consent to the "adres van elektronische woonstkeuze" of the defendant.[38] In both cases the e-mail sent by the bailiff does not contain the actual document to be served. Rather, the content of the documents can only be consulted on the digital platform (the Registry) created for that purpose. The defendant can only gain access to the content of the document after having identified and authenticated himself using his electronic id card (eID) and pincode or a technical equivalent method.

Within 24 hours of sending the service or the request for consent, the bailiff will receive a confirmation message from the Registry, indicating that service has actually been effected. If no such confirmation is received within that time frame, electronic service is not possible and needs to be effected in person.[39] When the defendant opens the e-mail message, the Registry notifies the bailiff. If no notification of opening is received within 24 hours of sending the service or

[32] Art. 38, §1 Belgian Judicial Code.

[33] Cass. 17 December 1998, *Arr. Cass*. 1998, 1155.

[34] Art. 32quater/3, §2 Belgian Judicial Code.

[35] Art. 32, 5° Belgian Judicial Code.

[36] Art. 32, 6° Belgian Judicial Code.

[37] Art. 32quater/1, §1, second sentence Belgian Judicial Code.

[38] Art. 32quater/1, §2, first sentence Belgian Judicial Code.

[39] Art. 32quater/1, §2, first and third sentence *iuncto* art. 32quater/3, §3 Belgian Judicial Code.

the request for consent, the bailiff will notify the defendant the next business day through regular mail that electronic service has been effected.[40]

In case the defendant does not have a known domicile or place of residence in Belgium, service abroad will have to take place. Service in another EU Member State will be regulated by the EU Service Regulation.[41] For service in non-EU states that are a member of the Hague Service Convention, that Convention will apply. If the non-EU country where the defendant is domiciled or resides, is not bound by the Hague Convention, service is effected by registered letter through air mail.[42]

If the defendant does not have a known domicile or place of residence at all (neither in Belgium nor abroad), the bailiff will serve the writ on the public prosecutor of the jurisdiction of the court which will deal with the claim.[43]

2.4. Looking into the Crystal Ball: Social Media Service in Belgium?

In this part, we will not attempt to forecast whether the Belgian legislator will ever decide to incorporate social media service as a service method. We will, however, set out which choices can be made and will signal some of the issues that will have to be dealt with.

First of all, one can wonder which advantages social media offer. One distinct advantage of social media service lies in the fact that it is able to achieve a high likelihood of actual notice. Users of social media platforms typically access their accounts on a regular basis.[44] A recent press release by Facebook, for instance, showed that there were 1.32 billion daily active users on average worldwide for June 2017 and 2.01 billion monthly active users as of 30 June 2017.[45] Social media are oftentimes accessed on mobile devices. On these devices users run applications that push instant notifications alerting the account holder of

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[40] Art. 32quater/1, §2, *in fine* Belgian Judicial Code.

[41] Regulation (EC) No 1393/2007 of the European Parliament and of the Council of 13 November 2007 on the service in the Member States of judicial and extrajudicial documents in civil or commercial matters (service of documents), and repealing Council Regulation (EC) No 1348/2000, *OJ* L 324.

[42] Art. 40, first paragraph Belgian Judicial Code.

[43] Art. 40, second paragraph Belgian Judicial Code.

[44] KNAPP, Keeley, "#serviceofprocess @socialmedia: Accepting Social Media for Service of Process in the 21st Century", *Louisiana Law Review*, vol. 74, no. 2, 2014, 547-579, 564

[45] See in this regard: https://investor.fb.com/investor-news/press-release-details/2017/Facebook-Reports-Second-Quarter-2017-Results/default.aspx

activity on his profile.[46] Besides, if service is performed via a private Facebook message or via a post on the defendant's Facebook wall, the likelihood of actual notice is even amplified. Under the default settings, the defendant will receive a notification through e-mail of the message or of the post and any subsequent comments.[47]

Compared to the second-newest kid on the block, e-mail service, social media holds a few trump cards. In case of service via e-mail there is no possibility to determine whether the e-mail address belongs to the defendant unless the defendant states so himself.[48] A social media account, on the other hand, can be scrutinised to verify the identity of the holder if the privacy settings allow it. Additionally, e-mail is more prone to spam attacks.[49] In that regard, social media networks fare better.[50] Spam messages are less common on social media platforms and malicious messages are less problematic because users can often view the sender's profile without opening the message or they can adjust their settings to disallow messages from individuals who they have not added as "friends".[51]

Having argued that service through social media platforms can have an added value, a subsequent question would be whether there is a need for this type of service to be implemented in Belgium. It is unlikely that the Belgian legislator will introduce social media service as a self-standing independent method. For Belgium, where e-mail service is still in its infancy, this would be too radical and controversial. In our opinion, there could nevertheless be a place for this innovative method in the Belgian system.

In part 2.3 it was explained that service on defendants who do not have a known domicile or place of residence is replaced by service on the public prosecutor of the jurisdiction of the competent court.[52] In Belgium the "Nationale

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[46] UPCHURCH, Angela, ""Hacking" Service of Process: Using Social Media to Provide Constitutionally Sufficient Notice of Process", *UALR Review*, vol. 38, 2016, 559-625, 601.

[47] District Court for the Southern District of New York, FTC v. PCCare247 Inc., 7 March 2013, 2013 WL 841037, 5.

[48] KNAPP, Keeley, "#serviceofprocess @socialmedia: Accepting Social Media for Service of Process in the 21st Century", *Louisiana Law Review*, vol. 74, no. 2, 2014, 569.

[49] WOLBER, Jeffrey, "Opening a Can of Worms and Viruses: The Impact of E-Service on E-Mail Users Everywhere", *New York Law School Law Review*, vol. 61, 2016-2017, 449-470, 450, footnote 1.

[50] SHULTZ, Andriana, "Superpoked and Served: Service of Process via Social Networking Sites", *University of Richmond Law Review*, vol. 43, 2009, 1497-1528, 1525, footnote 205 (statement made in the context of Facebook).

[51] WOLBER, Jeffrey, "Opening a Can of Worms and Viruses: The Impact of E-Service on E-Mail Users Everywhere", *New York Law School Law Review*, vol. 61, 2016-2017, 450, footnote 1.

[52] Art. 40, second paragraph Belgian Judicial Code.

Kamer van Gerechtsdeurwaarders" (the National Chamber of Bailiffs) does not keep statistics on the number of times service is in that regard effected on the public prosecutor. In the Netherlands, on the contrary, such figures are available. The Dutch service rules also require that a defendant without a known domicile or place of residence be served through the office of the public prosecutor at the court where the claim will be heard. In addition, an abstract of the writ must be published in the "Staatscourant".[53] The "Staatscourant" is an official online gazette containing *inter alia* different types of judicial announcements.[54] An Act of 11 February 2015 made the use of this online tool compulsory since 1 July 2015.[55] Before that date these so-called "public writs" were published in daily newspapers. According to the Explanatory Memorandum accompanying the Act 45.000 public writs are served each year.[56] Additionally, it is stated that bailiffs receive little or no response to public writs published in newspapers.[57] The Dutch legislator considered that the publication of these writs on a public site on the internet would increase the odds that the defendants would see it, leading to the putting into use of the "Staatscourant".[58]

There is no reason why these findings cannot be transposed to Belgium. It is extremely likely that the "artificial" service on the prosecutor does not inform the persons in question, given the results in the Netherlands where service on the prosecutor is even combined with service by publication. It is here that social media service could play a role. Belgian lawmakers could make it obligatory for plaintiffs to undertake a reasonable attempt to serve the elusive defendant via his social media channels, if any. In the Netherlands this idea has already been suggested by the "Adviescommissie Burgerlijk Procesrecht" (Advisory Committee on Civil Procedural Law) in the build-up to the adoption of the Act of 11 February 2015.[59] It can be expected that such a subsidiary place for social media service will prompt less resistance than embracing it as a full-blown mechanism. Furthermore, because social media service is deployed as a supplement to an established method, it will alleviate at least some of the sceptical concerns raised

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[53] Art. 54.2 Dutch Code of Civil Procedure.

[54] See for more information: https://zoek.officielebekendmakingen.nl/zoeken/staatscourant.

[55] Wet van 11 februari 2015 tot wijziging van het Wetboek van Burgerlijke Rechtsvordering en enige andere wetten in verband met bekendmakingen aan personen zonder bekende woon- of verblijfplaats, *Stb*. 2015, 82.

[56] Memorie van Toelichting, 4.

[57] Memorie van Toelichting, 2.

[58] Memorie van Toelichting, 2.

[59] Letter of 19 September 2013 concerning consultatiedocument Wijziging van het wetboek van burgerlijke rechtsvordering en enige andere wetten in verband met bekendmakingen aan personen zonder bekende woon- of verblijfplaats, 2, no. 3.

by its opponents. In that way, the policy choice would correspond to the U.S. example where social media service is, in most instances, offered in combination with another more conventional method (see part 2.2.B).

As to the concrete organisation of social media service, the Belgian legislator will face further issues. Certain safeguards relating to the authentication and regular use of the account will need to be construed. The American experience might serve as a source of inspiration. A further specific difficulty that can be identified relates to the bailiff who has to effect the service. Does the bailiff have to use an official account or can he use the account of the plaintiff or can he even send the notice via a fake account?[60] In case social media service is used as a supplementary method for defendants without a known address, service could perhaps be entrusted to the plaintiff (or his lawyer). Time will tell to what extent Belgium will "connect" with social media, if at all.

3. Case Study: Autonomous Vehicles and Liability

Another example we will discuss are autonomous vehicles. The increased use of such vehicles needs to be seen in a broader perspective of robots and artificial intelligence (part 3.1). Once some preliminary considerations have been discussed, we will proceed with an analysis of aspects related to the liability for damage caused by self-driving cars (part 3.2).

3.1. Preliminary Considerations on Robots

Finding an appropriate definition of a 'robot' is not straightforward due to its "a-technical nature, both from an engineering and a legal point of view".[61] Calo concludes that a robot is a machine with three qualities: (1) a robot can sense its environment, (2) a robot has the capacity to process the information it senses, and (3) a robot is organised to act directly upon its environment.[62] Defining artificial intelligence (AI) might be even more challenging as there is no

[60] In the United States a similar discussion exists in relation to the ethical rules governing the conduct of lawyers performing social media service. See for example: VAN HORN, Hans, "Evolutionary Pull, Practical Difficulties, and Ethical Boundaries: Using Facebook to Serve Process on International Defendants", *Global Business & Development Law Journal*, vol. 26, 2013, 570-574.

[61] BERTOLINI, Andrea, "Robots as Products: The Case for a Realistic Analysis of Robotic Applications and Liability Rules", *Law, Innovation and Technology*, vol. 5, no. 2, 2013, 214-247, 219.

[62] CALO, Ryan, Robots in American Law, University of Washington School of Law Research Paper no. 2016-04, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2737598, 6, read on 15 April 2018; CALO, Ryan, "Robotics and the Lessons of Cyberlaw", *California Law Review*, vol. 103, no. 3, 2015, 513-563, 529.

consensus on this concept.[63] Artificial intelligence has been the subject of much discussion and has caused a lot of confusion.[64] AI is an umbrella term comprised of many different techniques[65] and is best understood as a set of techniques aimed at approximating some aspect of human or animal cognition by using machines. In this regard, the concept of machine learning is important. Machine learning implies that a system does not only rely on predefined instructions to determine its behaviour but also on the independent analysis of large amounts of collected data. It refers to the capacity of computer algorithms to automatically learn or improve in performance on a task over time.[66]

Regardless of the precise definition of both concepts, human activities are increasingly being replaced by robots.[67] Robots are becoming prevalent in our daily, social and professional life.[68] Several examples can be used as an illustration. Collaborative robots or 'CoBots' have been designed to physically interact with humans in a shared workspace.[69] Prototypes of robots such as Riba can be used in the health sector to perform heavy physical nursing care tasks requiring human contact (e.g. lifting a bedridden patient from the bed to a wheelchair and

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[63] See for more information: TURING, Alan Mathison, "Computing Machinery and Intelligence", *Mind*, no. 49, 1950, 433-460; RUSSELL, Stuart & NORVIG, Peter, *Artificial Intelligence: A Modern Approach*, 3rd ed., New Jersey, Pearson New International, 2010.

[64] KOK, Joost Nico, *Artificial Intelligence*, 1st ed., Oxford, EOLSS Publications, 2009, 2.

[65] CALO, Ryan, "Artificial Intelligence Policy: A Primer and Roadmap", *U.C. Davis Law Review*, vol. 51, 2017, 399-435, 405.

[66] CALO Ryan, "Artificial Intelligence Policy: A Primer and Roadmap", *U.C. Davis Law Review*, vol 51, 2017, 405; SURDEN, Harry & WILLIAMS, Mary-Anne, "Technological Opacity, Predictability, and Self-Driving Cars", *Cardozo Law Review*, vol. 38, 2016, 121-181, 147.

[67] HALLEVY, Gabriel, "The Criminal Liability of Artificial Intelligence Entities - From Science Fiction to Legal Social Control", *Akron Intellectual Property Journal*, vol. 4, no. 2, 2010, 171-201, 172. See for an overview: IVANOV, Stanislav Hristov, "Robonomics - Principles, Benefits, Challenges, Solutions", *Yearbook of Varna University of Management,* vol. 10, 2017, 283-293.

[68] LEENES, Ronald *et al*, "Regulatory challenges of robotics: some guidelines", *Law, Innovation and Technology*, vol. 9, no. 1, 2017, 7.

[69] See for more information: PREIMESBERGER, Chris, Why CA Technologies is Moving into Collaborative Robotics, eWeek, 17 January 2018, http://www.eweek.com/innovation/why-ca-technologies-is-moving-into-collaborative-robotics, read on 20 April 2018.

back).[70] Robots have been used to run a hotel[71] or sell coffee in stores.[72] There are also growing concerns in the international community regarding so-called "killer robots" that might be used in armed conflicts.[73] Robots are increasingly used in the legal profession as well. Lawyers will eventually be replaced by algorithms,[74] while cases might in the future be adjudicated by an artificial intelligence judge.[75] A more prominent example is the rise of self-driving cars or autonomous vehicles.[76] According to recent predictions, fully autonomous vehicles could already be available within five to twenty years.[77] One could, therefore, say that the challenges posed by robots will only become more acute in light of the explosive growth of the robotics industry over the next decade. In sum, we "*are*

[70] MUKAI, Toshiharu *et al*., "Development of a Nursing-Care Assistant Robot RIBA That Can Lift a Human in Its Arms", *2010 IEEE/RSJ International Conference on Intelligent Robots and Systems*, 18-22 October 2010, 5996-6001, 5996.

[71] RAJESH, Monisha, Inside Japan's first robot-staffed hotel, The Guardian, 14 August 2015, https://www.theguardian.com/travel/2015/aug/14/japan-henn-na-hotel-staffed-by-robots, read on 19 April 2018.

[72] X, Nestlé employs fleet of robots to sell coffee machines in Japan, The Guardian, 1 December 2014, https://www.theguardian.com/technology/2014/dec/01/nestle-robots-coffee-machines-japan-george-clooney-pepper-android-softbank, read on 19 April 2018.

[73] See for example: CROOTOF, Rebecca, "The Killer Robots Are Here: Legal and Policy Implications", *Cardozo Law Review*, no. 36, 2015, 1837-1916; SMITH, Mark, Is 'killer robot' warfare closer than we think?, 25 August 25 2017, BBC News, http://www.bbc.com/news/business-41035201, read on 30 April 2018.

[74] See for example: X, Ready for robot lawyers? How students can prepare for the future of law, The Guardian, 31 July 2017, https://www.theguardian.com/law/2017/jul/31/ready-for-robot-lawyers-how-students-can-prepare-for-the-future-of-law, read on 22 April 2018. See, however: REMUS, Dana & LEVY, Frank, "Can Robots Be Lawyers? Computers, Lawyers, and the Practice of Law", *Georgetown Journal of Legal Ethics*, vol. 30, 2017, 501-558.

[75] ALETRAS, Nikolaos, TSARAPATSANIS, Dimitrios, PREOTIUC-PIETRO, Daniel & LAMPOS, Vasileios, "Predicting judicial decisions of the European Court of Human Rights: a Natural Language Processing perspective", *PeerJ Computer Science*, no. 2, 2016, https://peerj.com/articles/cs-93/, read on 15 April 2018. See in this regard also: CALO Ryan, Robots in American Law, University of Washington School of Law Research Paper no. 2016-04, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2737598, 25-32, read on 18 April 2018.

[76] See for more information: SURDEN, Harry & WILLIAMS, Mary-Anne, "Technological Opacity, Predictability, and Self-Driving Cars", *Cardozo Law Review*, vol. 38, 2016, 121-181; ZOHN, Jeffrey, "When robots attack: How should the law handle self-driving cars that cause damages", *University of Illinois Journal of Law, Technology & Policy*, vol. 2015, no. 2, 2015, 461-485.

[77] ANDERSON James, KALRA Nidhi, STANLEY Karlyn, SORENSEN Paul, SAMARAS Constantine & OLUWATOLA Tobi, Autonomous Vehicle Technology – A Guide for Policymakers, California, RAND, 4, https://www.rand.org/pubs/research_reports/RR443-2.html, read on 17 April 2018.

in the midst of a robotics revolution",[78] which is poised to be the next transformative technology.[79]

This increased use of robots will have several advantages. Robots are more accurate and efficient because they are faster and can process information better than humans.[80] As a consequence, they can perform many tasks better than their human counterparts.[81] Companies from various economic sectors already rely on robotics and artificial intelligence to decrease costs, generate revenues, enhance product quality and improve their competitiveness.[82] In addition to these general benefits, robots can also have more specific advantages for the sector where they are used. Take the example of self-driving cars. Transport will become more time efficient with autonomous car technology.[83] Human passengers can occupy themselves with other professional or leisure activities - as they do no longer have to pay attention to the road. The use of SDCs will also lead to a better flow of traffic and less accidents, which results in fewer traffic jams. All these factors have a positive influence on productivity and the work/life balance.[84] One of the most important advantages of autonomous vehicle technology is that traffic will become much safer with software operating the vehicle. The

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[78] CALO, Ryan, Robots in American Law, University of Washington School of Law Research Paper no. 2016-04, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2737598, 3, read on 15 April 2018.

[79] CALO, Ryan, "Open Robotics", *Maryland Law Review*, vol. 70, 2011, 571-613, 571.

[80] TZAFESTAS, Spyros, *Roboethics: A Navigating Overview*, 1st ed., Athens, Springer, 2015, 147.

[81] DEITEL, Harvey & DEITEL, Barbara, *Computers and Data Processing: International Edition*, 1st ed., Orlando, Academic Press, 2014, 434.

[82] IVANOV, Stanislav Hristov, "Robonomics - Principles, Benefits, Challenges, Solutions", *Yearbook of Varna University of Management,* vol. 10, 2017, 283-285, 283-293 with further references.

[83] See for example: ZOHN Jeffrey R., "When robots attack: How should the law handle self-driving cars that cause damages", *University of Illinois Journal of Law, Technology & Policy*, vol. 2015, no. 2, 2015, 471; DUFFY, Sophia & HOPKINS, Jamie, "Sit, Stay, Drive: The Future of Autonomous Car Liability", *SMU Science & Technology Law Review*, vol. 16, 2013, 453-480, 475 & 479.

[84] DE BRUYNE, Jan & TANGHE, Jochen, "Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective", *Journal of European Tort Law*, vol. 8, no. 3, 2018, 325 with further references.

number of accidents will reduce as computers are generally much better drivers than their human equivalents.[85]

At the same time, however, the introduction of robots also poses many challenges. Robots and artificial intelligence will have implications on various facets of our society. For instance, different studies illustrate that robotisation will affect the labour market.[86] SDCs might replace persons nowadays employed in the transportation sector or other related industries.[87] Experts also predict a decline in the so-called 'crash economy' once autonomous cars are commonly used. Involved in that economy are *inter alia* garages, lawyers, insurance companies, physical therapists and, ironic as it is, the car industry itself.[88] The increased use of robots will also pose several challenges from a legal or regulatory point of view.[89] Without going into further detail, robots might affect human rights such as privacy or the freedom of speech,[90] influence court proceedings or decision

[85] See for example: ZOHN, Jeffrey, "When robots attack: How should the law handle self-driving cars that cause damages", *University of Illinois Journal of Law, Technology & Policy*, vol. 2015, no. 2, 2015, 471; GURNEY, Jeffrey, "Sue my car not me: products liability and accidents involving autonomous vehicles", *University of Illinois Journal of Law, Technology & Policy*, vol. 2013, no. 2, 2013, 247-277, 250-251; DE BRUYNE, Jan & TANGHE, Jochen, "Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective", *Journal of European Tort Law*, vol. 8, no. 3, 2018, 325 with further references.

[86] See for example: ACEMOGLU, Daron & RESTREPO, Pascual, Robots and Jobs: Evidence from US Labor Markets, MIT Department of Economics Working Paper No. 17-04, 17 March 2017, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2941263, read on 28 April 2018; FREY, Carl Benedikt & OSBORNE, Michael, "The future of employment: How susceptible are jobs to computerisation?", *Technological Forecasting and Social Change*, vol. 114, 2017, 254-280, 254.

[87] DE BRUYNE Jan & TANGHE Jochen, "Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective", *Journal of European Tort Law*, vol. 8, no. 3, 2018, 326-327 with further references.

[88] ANDERSON James, KALRA Nidhi, STANLEY Karlyn, SORENSEN Paul, SAMARAS Constantine, OLUWATOLA Tobi, Autonomous Vehicle Technology – A Guide for Policymakers, California, RAND, xvii & 38-40, https://www.rand.org/pubs/research_reports/RR443-2.html, read on 17 April 2018; DE BRUYNE, Jan & TANGHE, Jochen, "Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective", *Journal of European Tort Law*, vol. 8, no. 3, 2018, 326-327 further references.

[89] See in general: LEENES, Ronald *et al*, "Regulatory challenges of robotics: some guidelines", *Law, Innovation and Technology*, vol. 9, no. 1, 2017, 2.

[90] See for example: BALKIN, Jack, "Free Speech in the Algorithmic Society: Big Data, Private Governance, and New School Speech Regulation", *UC Davis Law Review*, vol. 51, 2018, 1149-1210; MASSARO, Toni & NORTON, Helen, "Siri-ously? Free Speech Rights and Artificial Intelligence», *Northwestern University Law Review*", vol. 110, 2016, 1169-1194.

making processes[91] and raise questions of corporate law.[92] More importantly, liability issues will also become important in the future as robots will inevitably cause damage. In 2015, for instance, it was reported in the press that a robot killed a man at a Volkswagen factory in Germany.[93] Examples of accidents with autonomous vehicles are also interesting in this regard and will be examined in the next part.

3.2. The Liability Framework and Autonomous Vehicles

Vehicles will not suddenly become fully autonomous or self-driving. Instead, technology will gradually take over a user's control over the vehicle. Technology has already partly taken over some of the user's tasks in controlling the vehicle. Examples thereof are adaptive cruise control, lane keeping assistance and automatic parking systems. These forms of partial vehicle are covered by the umbrella term Advanced Driver Assistance Systems (ADAS).[94] Vehicles will eventually be able to take persons from one place to another without any human interference.[95] In that case, one can speak of a fully autonomous or driverless

[91] See for example: REMUS, Dana & LEVY, Frank, "Can Robots Be Lawyers? Computers, Lawyers, and the Practice of Law", *Georgetown Journal of Legal Ethics*, vol. 30, 2017, 501; COGLIANESE, Cary & LEHR, David, "Regulating by Robot: Administrative Decision Making in the Machine-Learning Era", *Georgetown Law Journal*, vol. 105, 2017, 1147-1223.

[92] See for example: MÖSLEIN, Florian, "Robots in the Boardroom: Artificial Intelligence and Corporate Law", in: BARFIELD, Woodrow & PAGALLO, Ugo, *Research Handbook on the Law of Artificial Intelligence*, 1st ed., Edward Elgar, 2018, forthcoming.

[93] HUGGLER, Justin, Robot kills man at Volkswagen plant in Germany, The Telegraph, 2 July 2015, https://www.telegraph.co.uk/news/worldnews/europe/germany/11712513/Robot-kills-man-at-Volkswagen-plant-in-Germany.html, read on 1 May 2018.

[94] See for more information: SURDEN, Harry & WILLIAMS, Mary-Anne, "Technological Opacity, Predictability, and Self-Driving Cars", *Cardozo Law Review*, vol. 38, 2016, 134-135; VAN WEES Kiliaan, "Vehicle Safety Regulations and ADAS: Tensions Between Law and Technology", in: X, *IEEE International Conference on Systems, Man and Cybernetics*, The Hague, 2004, 4011-4016.

[95] See for an overview of the technology used in autonomous vehicles: SURDEN, Harry & WILLIAMS, Mary-Anne, "Technological Opacity, Predictability, and Self-Driving Cars", *Cardozo Law Review*, vol. 38, 2016, 129-150; ANDERSON, James, KALRA, Nidhi, STANLEY, Karlyn, SORENSEN, Paul, SAMARAS, Constantine & OLUWATOLA, Tobi, Autonomous Vehicle Technology – A Guide for Policymakers, California, RAND, 55-74, https://www.rand.org/pubs/research_reports/RR443-2.html, read on 17 April 2018.

vehicle.[96] Today, only prototypes of such vehicles exist. They are currently being tested on the road by companies such as Google and Tesla.[97]

Despite the increased safety as a result of SDCs, road accidents will not suddenly disappear. Autonomous vehicles will share the road with 'regular' non-autonomous cars and other road users during a long transition period. Recent accidents show that the technology used in autonomous vehicles is indeed not entirely flawless. Technological sensors do not work perfectly in exceptional circumstances such as stormy weather or heavy rainfalls. The autopilot sensors of a Tesla car, for instance, were not able to distinguish a white tractor-trailer crossing the highway from the bright sky above, leading to a fatal crash.[98] In February 2016, an autonomous vehicle hit a bus because it did not know that long vehicles are less inclined to stop and give way.[99] More recently, several newspapers reported an accident with a Tesla autopilot vehicle, which resulted in the driver's death.[100]

Against this background, the question arises whether the legal framework dealing with the liability for damage caused by SDCs will need a fundamental make-over[101] or instead minor changes might be sufficient. In other words, one has to assess "*whether tort liability rules – as they are currently shaped – are suited to govern the "car minus driver" complexity, while simultaneously holding on to*

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[96] SURDEN, Harry & WILLIAMS, Mary-Anne, "Technological Opacity, Predictability, and Self-Driving Cars", *Cardozo Law Review*, vol. 38, 2016, 132-133.

[97] See for an extensive discussion and further references: DE BRUYNE, Jan & TANGHE, Jochen, "Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective", *Journal of European Tort Law*, vol. 8, no. 3, 2018, 324-371; DE BRUYNE, Jan & VANLEENHOVE, Cedric, "The Rise of Self-Driving Cars: Is the Private International Law Framework for non-contractual obligations posing a bump in the road?", *IALS Student Law Review*, vol. 5, no. 1, 2018, 14-26.

[98] See in this regard: Tesla's Blog, A Tragic Loss, 30 June 2016, https://www.teslamotors.com/blog/tragic-loss, read on 22 April 2018.

[99] See in this regard: BOWLES, Nellie, Google self-driving car collides with bus in California, accident report says, The Guardian, 1 March 2016, https://www.theguardian.com/technology/2016/feb/29/google-self-driving-car-accident-california, read on 19 April 2018.

[100] See for example: HULL, Dana & SMITH, Tim, Tesla Driver Died Using Autopilot, With Hands Off Steering Wheel, Bloomberg Technology, 31 March 2018, https://www.bloomberg.com/news/articles/2018-03-31/tesla-says-driver-s-hands-weren-t-on-wheel-at-time-of-accident, read on 1 May 2018; BOUDETTE, Neal, Fatal Tesla Crash Raises New Questions About Autopilot System, New York Times, 31 March 2018, https://www.nytimes.com/2018/03/31/business/tesla-crash-autopilot-musk.html, read on 1 May 2018.

[101] SURDEN, Harry & WILLIAMS, Mary-Anne, "Technological Opacity, Predictability, and Self-Driving Cars", *Cardozo Law Review*, vol. 38, 2016, 136.

their theoretical basis".[102] In any case, some changes to the legal framework will be inevitable. The Belgian Highway Code, for example, is not yet adapted to the introduction of autonomous car technology as it still requires that each vehicle has a 'driver'.[103] The driver must at all times be able to perform the necessary driving actions and must have his vehicle under control.[104] It is conceivable that the situation in other EU Member States will be quite similar. The existing liability rules might also need some changes with the commercialisation of SDCs. Reliance on fault-based liability will become uncertain in the context of autonomous vehicles. It will, for instance, not be easy to determine who the 'driver' is in an autonomous vehicle and whether he can be held liable for a violation of the law that is actually committed by the vehicle itself (e.g. crossing a red light). Research also showed that it is by no means straightforward to hold the user of an autonomous vehicle liable for a negligent act in supervising the technology.[105]

Liability in traffic-related matters will, therefore, evolve from a fault-based mechanism towards forms of strict liability. This means that victims will have to target other parties. There are different alternatives in national law. In Belgium, for instance, a party could sue the custodian of a defective object under Article 1384, first paragraph, of the Belgian Civil Code (BCC). That article imposes a strict liability regime for the custodian of a defective object for the damage caused by that object.[106] Another more interesting possibility is to file a claim against the manufacturer of the vehicles or the software under the EU

[102] DAVOLA, Antonio, A Model for Tort Liability in a World of Driverless Cars: Establishing a Framework for the Upcoming Technology, 1 February 2018, 2, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3120679, read on 1 May 2018.

[103] Art. 8.1. Koninklijk besluit van 1 december 1975 houdende algemeen reglement op de politie van het wegverkeer en van het gebruik van de openbare weg, published on 9 December 1975 (Highway Code).

[104] Art. 8.3. Highway Code. See in this regard also the decision by the Belgian Court of Cassation, 17 January 1989, *Arr. Cass.* 1988, 599 & *Verkeersrecht-Jurisprudentie* 1989, 181.

[105] See for an extensive discussion and further references: DE BRUYNE, Jan & TANGHE, Jochen, "Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective", *Journal of European Tort Law*, vol. 8, no. 3, 2018, 344-347.

[106] See for an extensive discussion and further references: DE BRUYNE, Jan & TANGHE, Jochen, "Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective", *Journal of European Tort Law*, vol. 8, no. 3, 2018, 348-354.

Product Liability Directive.[107] Article 1 of the Directive stipulates that the producer will be held liable for damage caused by a defect in his product.[108] The question arises whether the Product Liability Directive is adapted to the reality of self-driving cars. In this regard, the GEAR 2030 High Level Group concluded that the motor insurance and product liability directives are sufficient at least for those systems expected by 2020. After that date, however, the application of the Product Liability Directive risks to create a number of problems.[109] Against this background, we will examine whether this framework is inadequate and out of tune with the reality of SDCs by focusing on two elements,[110] namely whether software can be qualified as product (part A) and the moment when the vehicle is put into circulation (part B).[111]

A. Qualification of Software

Article 2 of the Product Liability Directive defines a product as all movables, with the exception of primary agricultural products and game, even though incorporated into another movable or into an immovable. There is a debate on the question whether software qualifies as product or not. There are several reasons why software cannot be seen as product. For instance, software might be qualified as a service and not as a product. In addition, the Directive only mentions 'movables'. Therefore, it relates to tangible goods only. It would otherwise make no sense to explicitly include electricity in the scope of the Directive.[112] This requirement is problematic for software products. Software is a collection

[107] Council Directive 85/374/EEC of 25 July 1985 on the approximation of the laws, regulations and administrative provisions of the Member States concerning liability for defective products, *OJ* L 210. See for a discussion of product liability and self-driving cars in the United States: SMITH, Bryant Walker, "Automated Driving and Product Liability", *Michigan State Law Review*, vol. 2017, no. 1, 2017, 1-74; GURNEY, Jeffrey K., "Sue my car not me: products liability and accidents involving autonomous vehicles", *University of Illinois Journal of Law, Technology & Policy*, vol. 2013, no. 2, 2013, 257-277.

[108] Article 1 Product Liability Directive. According to Article 5, a product is defective if it does not provide the safety that a person is entitled to expect, taking all circumstances into account.

[109] High Level Group on the Competitiveness and Sustainable Growth of the Automotive Industry in the European Union (GEAR 2030), "Ensuring that Europe has the most competitive, innovative and sustainable automotive industry of the 2030s and beyond", October 2017, 43-44.

[110] DAVOLA, Antonio, A Model for Tort Liability in a World of Driverless Cars: Establishing a Framework for the Upcoming Technology, 1 February 2018, 2, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3120679, read on 1 May 2018.

[111] See for an extensive discussion and further references: DE BRUYNE, Jan & TANGHE, Jochen, "Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective", *Journal of European Tort Law*, vol. 8, no. 3, 2018, 355-364; 367-370.

[112] Article 2 *in fine* Product Liability Directive.

of data and instructions that is imperceptible for the human eye. A software system is thus often regarded as intangible. Accordingly, it might not fall within the scope of the Product Liability Act.[113]

At the same time, however, there are also some reasons why software should fall within the scope of the Product Liability Directive. Software might be seen as the *object* of a service. It is, therefore, covered by the Directive. Software can also be qualified as a product because it is captured on a tangible medium or device (e.g. CD-ROM or USB). This has been affirmed by the European Commission.[114] Software *an sich* might be considered as a material good as well. The Directive could apply to software even if it is qualified as an intangible good. After all, the inclusion of electricity clarifies that the drafters of the Directive aimed at a wide material scope. Legislators did not think of software in the early 1980s as personal computers only became commercially widespread during the second half of the 1980s. It is thus conceivable that software, in a teleological interpretation of the Directive, falls within the scope of the Directive. The European Court of Justice might come to a similar conclusion in the future. The inclusion of software in the Directive would also reflect the current economic reality in which software is a commercial product just as any other product that may entail risks for users and third parties.[115]

B. Putting the Self-Driving Car into Circulation

Pursuant to Article 7(b) of Product Liability Directive, the manufacturer of the product can escape liability when he proves that it is probable that the defect causing the damage did not exist at the time when the product was put into circulation or that this defect came into being afterwards. If software is qualified as a product, any update thereof could be considered an act by which the producer brings a new product into circulation. However, it becomes more difficult with so-called self-learning systems. These systems are not periodically updated but continually improve themselves. For defects that are created in this way, a moment of putting the product into circulation cannot be indicated as the manufacturer did not perform an act to that end. The same reasoning also applies to the liability of the manufacturer of the vehicle. The changes made by a self-lear-

[113] See for an extensive discussion and further references: DE BRUYNE Jan & TANGHE Jochen, "Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective", *Journal of European Tort Law*, no. 8, 2018, 355-357.

[114] See in this regard: Written Question no. 706/88 of 5 July 1988 and Answer by Lord Cockfield on behalf of the Commission on 15 November 1988, *OJ* 114/42, 8 May 1989.

[115] See for an extensive discussion and further references: DE BRUYNE, Jan & TANGHE, Jochen, "Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective", *Journal of European Tort Law*, vol. 8, no. 3, 2018, 355-357.

ning system and the updates performed by the software producer can create defects for which the car manufacturer is no longer liable. Indeed, those defects did not exist at the time when he put the vehicle into circulation. Although the vehicle meets the definition of a product, its manufacturer might thus easily escape liability if the damage is caused by a dysfunction in the software. One could argue that Article 7(b) Product Liability Directive should be inapplicable in those circumstances. This makes it possible for victims to file a claim against the manufacturer of the software even when the defect is created through the continuous self-development of software.[116]

4. Concluding Remarks

The article examined whether some of the existing legal principles in two different fields are compatible with technological evolutions. As to service of process via social media, the article explored the remarkable finding that some courts in common law countries have allowed the notice of the commencement of civil proceedings to be effected via one or more social media accounts belonging to the defendant. In contrast, in continental EU jurisdictions this phenomenon does not exist. The article laid the conditions imposed by American courts for this type of service bare and subsequently gave an overview of the Belgian procedural framework. Even though it remains to be seen whether the Belgian legislator will ever be tempted by this novel method of service, it is submitted that social media service could be useful as a second layer of subsidiary notice when the defendant does not have a known address. With regard to self-driving cars, some legal changes at the national level are inevitable. Legislation dealing with road safety is not yet adopted to the introduction of autonomous vehicles. We have also shown that the application of some of the concepts used in the EU Product Liability Directive might become problematic when SDCs will be commercialised. For instance, the moment of putting the product into circulation might be incompatible with autonomous systems. In any case, when policymakers would change the legal framework, they should take into account that a minor modification of one aspect (e.g. qualification of software) can have major consequences on the liability of the manufacturers of software or of the self-driving vehicle. Therefore, we suggest a balanced and well-considered approach when it comes to adapting the existing legal framework to technological evolutions.[117]

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[116] DE BRUYNE, Jan & TANGHE, Jochen, "Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective", *Journal of European Tort Law*, vol. 8, no. 3, 2018, 362-363 & 370.

[117] See in this regard also: DE BRUYNE, Jan & WERBROUCK, Jarich, "Merging self-driving cars with the Law", *Computer and Security Law Review*, vol. 34, no. 5, 2018, forthcoming.

ASSURING PRIVACY AND DATA PROTECTION WITHIN THE FRAMEWORK OF SMART TOURISM DESTINATIONS[1]

Manuel David Masseno[2], Cristiana Santos[3]

Abstract: Data lies at the core of all smart tourism activities as tourists engage in different and personalized touristic services whilst the pre/during/post travelling or in holidays. From these interactions, a digital data trail is seamlessly captured in a technology embedded environment, and then mined and harnessed in the context of STD - Smart Tourist Destinations to create enriched, high-value experiences, namely those related to eco-responsibility, as well as granting destinations with competitive advantages. The perceived enjoyment of experiences must be considered within the legal framework of Privacy and Data Protection by exposing inherent risks, analysing the available answers given by the GDPR – the General Data Protection Regulation of the European Union. Hence the purpose of this paper is i. to singularize the specificities of Smart

[1] Paper drafted within the framework of the Research Project: "Big Data, Cloud Computing y otros retos jurídicos planteados por las tecnologías emergentes; en particular, su incidencia en el sector turístico" - DER2015- 63595 (MINECO/FEDER), Coordinated by Professor Apollònia Martínez Nadal at the Universitat de les Illes Balears, Spain.

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Tourism Destinations; ii. to show how the principles of personal data protection, as set forth by the GDPR, are allocated within the STD realm; iii. and, finally, to derive potential legal implications of this ecosystem. Our approach is based on a legal analysis engaged in scholarship research. We have mostly denoted the underestimation of the legal implications of technology-enhanced tourism experiences, and the marginalization of both informed involvement and awareness by the individual in these processes. This study is novel in having undertaken an initial exploration of the legal implications of experiences taking place by STD.

Keywords: Privacy and Data Protection, Smart Tourism Destinations

Introduction

Smart Tourism Destinations (hereinafter called STD) are an offspring of the technological foundations of *Smart Cities*, themselves benefiting from the interplay with other technological environments based on the *Internet of Things* (IoT) and the *Cloud*, as enabled by *Big Data Analytics*.

However, while these subjects have been examined extensively within Privacy literature, their specific context and legal consequences on STD is still to be explored. As a matter of fact, this is perceived and pointed out as a missing issue by the Tourism Science literature regarding STD[4]. Given the insufficiencies in the literature and these recent claims, this study aims to provide a theoretical review of the technology-empowered tourism experiences and its legal implications to privacy and data protection.

[4] Even being tourism the world's largest industry, with receipts of almost 1,200 USD Billion in 2017, and growth expectations of 4% to 5% for 2018, according to the *UNWTO Barometer*, notwithstanding internal tourism. Accessible at http://media.unwto.org/press-release/2018-01-15/2017-international-tourism-results-highest-seven-years consulted on the 02/05/2018.

Theoretically and in practice, STD have been designed to enrich tourism experiences and to enhance the competitiveness of each destination.

ICTs embedded within tourism destinations environments allow the collecting and analysis of large amounts of tourism data for the identification of attitude patterns and to predict behaviours of tourists and travelers. This is achieved by addressing their potential needs and desires even at an unconscious level of travelers.

Regarding this connection between Tourism and ICTs, we're facing a new relationship between clients-tourism providers which is very context-specific: i. Short-lived engagement, focused on the pre/during/post travel, which makes trust-building and costumer's loyalty much harder[5]; ii. Imminent need for real-time information *in situ,* for vacation decision-making, so that tourists might be easily persuaded to forego their data; iii. Heightened benefits or "*perceived enjoyment*" (evoked by the engaging content, discounts, and interactive system features)[6], suggesting that personal data is traded therewithal for useful purposes and hence privacy concerns might be temporarily suspended; iv. Tourism activities take place in locations outside of the usual realm of the traveler, and are often facilitated by unknown local service providers, which decrease privacy risk perceptions[7], for instance at natural spaces apparently far from urban invasive surveillance; v. Growing number of connected smart objects and wearable devices involved in a network of multiple vendors and interoperating systems, where privacy issues are blanked out; vi. Multiple stakeholders' interaction making it even harder to identify privacy flaws.

The following illustrative examples provide insight towards the personalized and smart added-value services that STD can offer:

> *Full historic immersions through smart optics devices or augmented reality for a "happy guest" are services already offered. Further, location-based services (LBS) could alert users to the closeness of birds to be watched or to endemic plants. Besides, estimated waiting time for the entrance to Natural Parks and other Protected Sites can be accurately quoted, to the minute, so tourists may reorganize their visiting or trail options or get a drink in a bar while waiting. Besides, aware on customers' special dietary circumstances in regard with their medical condition, as well as religion restrictions, tourism service providers may provide for*

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[5] NEUHOFER, Barbara; BUHALIS, Dimitrios, *et al.*, «Smart technologies for personalized experiences: a case study in the hospitality domain», *Electronic Markets*, Vol 25, Issue 3, 2015, pp. 243-254.

[6] NEUHOFER, Barbara; BUHALIS, Dimitrios, *et al.*, «Smart technologies for personalized experiences: a case study in the hospitality domain», *cit*.

[7] GRETZEL, Ulrike; SIGALA, Marianna *et al.*, «Smart tourism: foundations and developments», *Electronic Markets*, Vol. 25, Issue 3, pp. 179–188.

meals that suits their preferences. As for transport, real-time information about the tourist's destinations, which direction to get on, and the ability to respond (i.e., by suggesting alternatives) to unpredictable events in real-time are envisioned, namely sudden weather changes. RFID tags on their outfit would make it easier to locate travelers in case of being lost or in order to identify those liable for damages inflicted to natural spaces or protected species.

All these enhanced services allow tourists to get much more from their travel and helps them fulfilling the experiential travelling potential of the destination[8]. STD experiences are hence achieved through intensive personalization, context-awareness and real-time monitoring[9]-[10] processes of information management which entail legal risks, demanding a careful analysis within the data protection framework.

Given the nature of STD and its uses, the application of some of the principles of data processing (*e.g.* the principles of data minimization, purpose limitation, fairness and transparency, and free, specific and informed consent) may be challenging in this technological scenario.

As a large spectrum of user-generated content is tourism data processed in a smart tourism environment concern personal data and human interaction, there is a direct impact on individuals and their rights with regard to the processing of personal data.

As explicitly mirrored in Article 8 (3) of the *Global Code of Ethics for Tourism*[11], tourists and visitors should benefit from the same rights as the citizens of the country visited concerning the confidentiality of the personal data and information concerning them, especially when these are stored electronically. Therefore, it should be underlined that Privacy and Data Protection evaluation is needed in any tourism environment, balancing the tradeoff value and affordances added by STD and its legal protection. This work therefore provides a

[8] BUHALIS, Dimitrios; AMARANGGANA, Aditya, «Smart Tourism Destinations», XIANG, Zheng; TUSSYADIAH, Lis (Eds.), *Information and Communication Technologies in Tourism 2014 - Proceedings of the International Conference in Dublin, Ireland*, Heidelberg: Springer, 2014, pp. 553-564.

[9] BUHALIS, Dimitrios; AMARANGANNA, Aditya, «Smart Tourism Destination», *cit*.

[10] BUHALIS, Dimitrios; AMARANGANNA, Aditya, «STD: Enhancing Tourism Experience Through Personalisation of Services», in TUSSYADIAH, Lis; INVERSINI, Alessandro (Eds.), *Information and Communication Technologies in Tourism 2015 - Proceedings of the International Conference in Lugano, Switzerland*, Heidelberg: Springer, 2015, pp. 377-389.

[11] Accessible at http://ethics.unwto.org/en/content/global-code-ethics-tourism-article-8, consulted on the 02/05/2018.

study of the principles of data protection, as set forth by the GDPR, within the STD context.

The paper is organized as follows. Section 1 explains the background of STD, describing briefly its specificities and giving examples of technologically enhanced and empowered experiences. Section 2 explains how smart technologies affect compliance with the principles of the General Data Protection Regulation[12], as the current basis of Privacy and Data Protection Legal system in the European Union. Section 3 concludes the paper and provides some clues for future directions.

1. Specificities of STD

This section describes the constituents of STD, objectives and derived added value.

1.1 Smart Tourism Destinations

In order to characterize more closely the utility functions layered in tourism destinations, it is worthy to point out that successful destinations are composed by five tourism dimensions: transportation, accommodation, gastronomy, attractions and ancillaries services, which can be then structured into six axes or "6As" as the literature describes[13], namely: i. Attractions, which can be natural, like as mountain or a seaside; artificial, as amusement parks or sports facilities; or cultural such as music festival or a museum; ii. Accessibility refers to the transportation within the given destination; iii. Amenities characterize all services, namely accommodation, gastronomy and leisure activities; iv. Available Packages; v. Activities; and vi. Ancillary Services (e.g. daily use services such as bank, postal service and hospital).

By applying *smartness* into tourism destinations, STD are defined as:

> *"[…] tourism supported by integrated efforts at a destination, to find innovative ways to collect and aggregate/harness data derived from physical infrastructure, social connections, government/organizational sources and human bodies/minds in combination with the use of advanced technologies to transform that data into*

[12] Regulation (EU) 2016/679, of the EP and of the Council of 27/04/2016, 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), applicable from the 25th May 2018.

[13] BUHALIS, Dimitrios, «Marketing the Competitive Destination of the Future». *Tourism Management*, Vol. 21, 2000, pp. 97–116.

enhanced experiences and business value-propositions with a clear focus on efficiency, sustainability and enriched experiences during the trip"[14].

This embracing concept comprises three core elements of destinations[15]:

i. Reliance on smart technology infrastructures, wireless sensor networks (*IoT*) and integrated communications systems, e.g. sensor technology, ubiquitous wifi, near-field communication (NFC), smart mobile connectivity, radio-frequency-identification (RFID), sophisticated data warehouses; data mining algorithms, also considered vital to creating a smart technology infrastructure[16]. *IoT* provides support in terms of information gathering and analysis as well as regarding automation and control. For instance, chips embedded to entrance tickets, or a smartphone app, allow tourism service providers to track tourists' locations and their consumption behavior, enabling location-based advertising or rescue in case of them getting lost when departing from an usual trail. In addition, cloud computing services may provide access to solid web platforms and data storage through public electronic communications network. It also encourages information sharing, a fundamental feature for STD. For example, a sophisticated tour guide system could serve massive number of tourists without being actually installed on any personal device, even allowing personalizing experiences;

ii. Built on an infrastructure of state-of-the-art technology, "[…] *accessible to everyone, which facilitates the visitor's interaction with and integration into his or her surroundings, increases the quality of the experience at the destination, and improves residents' quality of life*"[17];

iii. Smart business networks, referring to the number of applications at various levels supported by a combination of *Cloud Computing* and *IoT*.

1.2 Technology-Enhanced and Empowered Experiences

The shared *purpose* of all omni-channel actors of a smart tourism ecosystem is to provide enhanced/enriched, high-value, meaningful, memorable tourism experiences through services and products mediated through technology (technology-mediated experiences).

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[14] GRETZEL, Ulrike; REINO, Sofia *et al*., «Smart Tourism Challenges», *Journal of Tourism*, 2015, Vol. 16, Issue 1, pp. 41-47.

[15] HÖJER, Mattias & WANGEL, Josefin, «Smart Sustainable Cities: Definition and Challenges», In HILTY, Lorenz; B. AEBISCHER, Bernard (Eds.) *ICT Innovations for Sustainability, Advances in Intelligent Systems and Computing*, Heidelberg: Springer, 2015, pp. 333-349.

[16] GRETZEL, Ulrike; REINO, Sofia *et al*., *op. cit*.

[17] HÖJER, Mattias & WANGEL, Heidelberg: Springer, 2015, *cit*.

Such experiences are rendered *enhanced* or *empowered*, according to the type and role of technology used. In *technology-enhanced experiences*, technology available in the Web 2.0 plays a supporting role to make consumers actively participate and shape the creation of their experiences. Consumers use social networking sites and mobile apps to interact with organizations, use review sites, comment and use media to share their experiences[18].

On the other hand, "*technology-empowered experiences*" emerge from advanced technological developments, such as interactive environments, augmented reality, near field communications, gaming, etc. At this latter level, technology is pervasive and allows tourists to interact and engage with the different service-providers throughout all the stages of travel, service encounters and touch-points, either in the physical tourism destination or in the online space. These new experiences are predicted to be richer, more participatory. In fact, consumers play an active part in co-creating[19] their own experiences, recognizing these way active consumers co-creating their experiences in a quest for personal growth and value.

It is pertinent to systematize and explore some types of technologies worn in practical settings within destinations to enhance and empower experiences. Technologies range from:

I. Social networking sites (SNSs);

II. Mobile applications (destination apps) ;

III. Interactive websites;

IV. Interactive ordering systems (eTable technology)

V. Interactive mobile platforms (iPads);

VI. Wearable devices;

VII. Big data analytics;

Social networking sites (SNSs), as referred in i., have already expanded their capabilities as build-in apps to meet social media user´s needs; they are mostly *Facebook, YouTube, Twitter, TripAdvisor, Yelp* and have made user-generated content (UGC) such as preferences, needs, interests, profiles, etc. freely accessible online. Such user-input content is reified in social profiles, reviews,

[18] TUSSYADIAH, Lis; & FESENMAIER, Daniel, «Mediating the tourist experiences access to places via shared videos», *Annals of Tourism Research*, Vol. 36, Issue 1, 2009, pp. 24-40.

[19] PRAHALAND, C. K.; RAMASWAMY, Venkat, «Co-creation experiences: the next practice in value creation», *Journal of Interactive Marketing,* Vol. 18, Issue 3, 2004, pp. 5-14.

ratings, comments, impressions on past experiences, recommendations for future purchases, etc.). The travel review website *TripAdvisor* generates a significant source of tourism-related (open) data given the figures and reviews on attractions/destinations; as a means of illustration, "*in 2015, TripAdvisor reached 320 million reviews and had 6.2million opinions on places to stay, to eat and on things to do - including 995,000 hotels and forms of accommodation, 770,000 vacation rentals, 3.8 million restaurants and 625,000 attractions in 125,000 destinations throughout the world*"[20].

Destination mobile applications mentioned in ii. are characterized by their "*mobiquity*" (mobility and ubiquity), and free wifi access to information anywhere and anytime have led to a behavioral transformation of tourists from *"sit and search" to "roam and receive*"[21].

As an example of iii., the interactive online website *PixMeAway*[22] is a picture-based search engine that allows consumers to interact with the interface, select appealing travel motifs, photos, the traveler type, and define their travel personality. The website will provide destination suggestions matching their criteria.

As an example of iv. the *Inamo Restaurant*[23] provides an instance in which the technology empowers the tourism experience. This restaurant "[…] *introduces a fully digitalized dining experience and interactive ordering system. This system, developed by E-Table, uses a combination of table touchpads and overhead projection to allow customers to see the food and drinks menu projected onto the table surface. The system further allows customers to change table clothes to the current mood and preferences, watch their food being prepared in the kitchen through a webcam in real time, manage the waiter and bills, explore the local neighborhood for activities afterwards or order a cab home. By doing so, the restaurant provides the physical technology (interactive tables) without which the unique dining experience could not occur, rendering the technology the central element of the experience creation.*

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[20] PANTANO, Eleonora; PRIPORAS, Constantinos-Vasilios *et al*, «You will like it!' Using open data to predict tourists' responses to a tourist attraction», *Tourism Management*, Vol. 60, 2017, pp. 430-438; and also the *TripAdvisor annual report for 2015*. Accessible at http://ir.tripadvisor.com/static-files/a0cc5025-7f78-416f-9643-e863f5e307a5 consulted on the 02/05/2018.

[21] PIHLSTRÖM, Minna, *Perceived Value of Mobile Service Use and its Consequences*, Helsinki: Swedish School of Economics and Business Administration, 2008, accessible at https://helda.helsinki.fi/bitstream/handle/10227/269/176-978-951-555-977-7.pdf?sequence=2&origin=publication_detail, p. 1, consulted on 02/05/2018.

[22] Accessible at http://www.pixmeaway.com/, consulted on the 02/05/2018.

[23] Accessible at http://www.inamo-restaurant.com/, consulted on the 02/05/2018.

As an example of v., the *Hotel Lugano Dante*[24] provides a case of hotel enrichment context where mobile platforms can come into play to facilitate and enhance the level of interaction between company and guests throughout the entire hotel experience. In such hotel, "*Guests provide personal information and preferences, such as room temperature, favorite beverages, and preferred newspapers and so on, whereas members of staff retrieve this specific information. By accessing the platform on a mobile device, the hotel and guests co-create through exchanging information in real time, which are used to facilitate encounters on multiple touch points. This leads to more personalized interactions, more valuable service encounters and on overall enhanced experience for the guest"*.

Wearable devices, listed as vi. are body-attached computers and are part of the *IoT,* therefore contributing to ubiquitous computing. Nowadays, there are different types of wearables applied to tourism destinations[25]:

- Smart watches provide notifications such as status updates, comments, photo tags, check-in, etc. Tourists can also receive real-time flight alerts, gate changes, and other information on their wrists;
- Bracelets/watches can track guests' sleeping patterns, as clients wear a watch while sleeping and wake them through gentle vibrations;
- Wrist band able to swipe hotel room keys;
- Smart glasses used by tourists in museums, art galleries to see cultural artifacts and activate digital contents, such as video, games, photos, etc. on the glass display screen by simply looking at the collection item; visitors can easily switch between real objects and augmented reality.

All wearables have in common the fact they collect and process user-specific data. Alongside body-data, many wearables record location-data and geo-data, often unnoticed by the users, for they can be used to calculate the distance travelled, to determine the user's location, etc., which poses a challenge for present data protection and privacy. Moreover, the use of wearable devices does not only involve its user (the owner of the device), but also the manufacturer, third-party providers and other intermediaries (insurance companies,

[24] NEUHOFER, Barbara; BUHALIS, Dimitrios *et al*., «Smart technologies for personalized experiences: a case study in the hospitality domain», *cit*.

[25] ATEMBE, Roland, «The Use of Smart Technology in Tourism: Evidence From Wearable Devices», *Journal of Tourism and Hospitality Management*, December, Vol. 3, n. 11-12, 2015, pp. 224-234.

scientists or advertising companies). Furthering, data is often not stored locally or processed by the device itself, but forwarded to a Cloud service (even possibly located outside Europe)[26].

Concerning big data analytics, pointed in vii., tourism data is an asset being exploited using a multi-modal pipeline of advanced data analysis methods called big data analytics[27] comprising content analytics crawlers (mining unstructured content), machine learning (ML) algorithms, natural language processing tools (NLP) and data mining techniques (DM). Distinctive aspects of big data analytics are briefly mentioned herewith to foresee its implications on data protection[28]: i. Use of large numbers of ML algorithms against data to find correlations, inferences between data. Once relevant correlations are identified (originally unforeseen), a new ML algorithm can be created and deployed to specific cases in the future; ii. Tendency to collect and analyze *all* the data that is available; iii. Repurposing of data for which it was originally collected, as analytics can mine data for new insights and find correlations between apparently disparate datasets; and iv. Use of new types of data automatically generated and coming from the IOT devices, as sensors. Even though these methods endow stakeholders with a fine-grained data to extract value, trends and patterns, thereby enabling them to customize technology-empowered experiences through smart products and services, they also increase known risks hampering privacy and data protection[29].

The implementation of the above mentioned smart ICT enhances tourism experience through the offer of products/services that are customized, personalized (personalized infotainment services), to meet each of the visitor's unique needs and even implied desires, since understanding travelers' needs, wishes and desires becomes increasingly critical for the attractiveness of destinations. Such customization, personalization and profiling is attained by *collecting* UGC from all these technological artifacts, and *reusing* it to provide meaningful offers

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[26] JÜLICHER, Tim; DELISLE, Marc, «Step into 'The Circle'—A Close Look at Wearables and Quantified Self», In HOEREN, Thomas; KOLANY-RAISER, Barbara (Eds.), *Big Data in Context - Legal, Social and Technological Insights*, Heidelberg: Springer, 2018, pp. 81-91.

[27] WATERMAN, K.; BRUENING, Paula, «Big Data analytics: risks and responsibilities», *International Data Privacy Law*, Vol. 4, Issue 2, 2014, pp. 89-95.

[28] MANTELERO, Alessandro; VACIAGO, Giuseppe, «The 'Dark Side' of Big Data: Private and Public Interaction in Social Surveillance. How data collections by private entities affect governmental social control and how the EU reform on data protection responds in Social Surveillance», *Computer Law Review International*, Vol. 14, 2013, pp. 161-169.

[29] COUTURIER, Hervé, *At the Big Data Crossroads: turning towards a smarter travel experience*. Amadeus IT Group Report, 2013, accessible at http://amadeusblog.com/wp-content/uploads/Amadeus-Big-Data-Report.pdf, consulted on 02/05/2018.

fitting perfectly the clients' needs[30] with the ultimate desideratum of achieving more satisfaction[31] at the experience environment.

Therefore, tourism-related data has multiplied geometrically[32] through its varied provenance (SNSs, apps, sensors, etc.). These sources provide a massive size of volunteered, observed, inferred or collected digital traces, resulting in multidimensional sets of data, known as big data[33]. This massification of real-time tourism-related data, analyzed by *IoT* industries, has created big pools of data to mine. Hence, SDT can be considered both as consumers and producers of big data.

This tourism-related data, inherently cross-border, holds strategic commercial value. It comprises, for example, i. transactional data between tourists and transportation/hospitality undertakings (airlines, hotel, restaurants and rental car businesses)[34] derived from queries/searches, purchases, and other exchanges; ii. geographical data; and iii. UGC from client's profiles, established preferences, needs, etc. These data can reveal commercial preferences of its users, allows the detection and prediction of future behaviors and trends, rendering enormous interest for economic operators, and allow destinations to better plan for future tourists in terms of mobility, popular attractions, and other potential issues. By managing such big data, tourism organizations can extract valuable insight from information that could elevate them to a new dimension of customer experience and improve the way they interact with customers, hence gain-

[30] EDWARDS, Lilian, «Privacy, security and data protection in smart cities: a critical EU law perspective», *European Data Protection Law Review*, Vol. 2, 2016, pp. 28-58.

[31] LAW, Rob; LEUNG, Rosanna *et al.*, «Information technology applications in hospitality and tourism: a review of publications from 2005 to 2007», *Journal of Travel & Tourism Marketing*, Vol. 26, Issue 5-6, 2009, pp. 599-623.

[32] MANYIKA, James; CHUI, Michael *et al.*, *Big data: The next frontier for innovation, competition, and productivity*. Report McKinsey Global Institute, 2011, accessible at https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/big-data-the-next-frontier-for-innovation, consulted on 02/05/2018.

[33] HABEGGER, Benjamin; HASAN, Omar, *et al.* «Personalization vs. Privacy in Big Data Analysis», *International Journal of Big Data*, Issue 1, 2014, pp. 25-35.

[34] These activities reveal aspects on destination/origins, way-finding preferences (beach, sports, culture, restaurants, etc.), spending capacities, and on behaviours (family tourism, leisure, night clubs, events, etc.), etc.

ing competitive advantage[35]. Such information is the fabric for companies to convert big and *open data*[36] into future preferences and value propositions[37].

However, such processing of personal information (data trails or digital footprints) contains the risk of building of a detailed profile of tourists, actually, a holistic personal mosaic of the individual users, with imminent implications for privacy and data protection[38].

2. Compliance of Smart Tourism Destinations with the privacy and data protection principles

2.1 Fairness and Transparency

Article 5(1) (a) states that personal data must be "processed fairly, lawfully and in a transparent manner in relation to the data subject". Accordingly, destinations must assess if their processing of personal data is fair and transparent. Transparency of automated decision-making is taking an increasingly important role with the advent of big data analytics. Whether the data are volunteered, observed, or inferred, or collected from accessible sources, individuals are fully entitled to know which are they, from where and from whom the controllers obtained it, and how automated decisions were taken.

Denote that big data algorithms (also used in STD scenarios) learn and change in a (semi) autonomous way, making them hard to document; further, organisations often claim secrecy over "how" data is processed on grounds of commercial confidentiality and copyright protecting the software and the trade-secret shield[39]. Profiling and correlation results are hence invisible and opaque, and

[35] BUHALIS, Dimitrios; AMARANGGANA, Aditya, «Smart Tourism Destination», *cit*.

[36] We denominate this data as "open data", as it accomplishes the criteria of i. availability and access; ii. reuse and redistribution; iii. Universal participation, i.e., this data can be reused by anyone, https://okfn.org/opendata/. It is notable to state that growing amount of tourism-related open data is available in machine-readable ways (XML, CSV, or JSON format), PANTANO, Eleonora; PRIPORAS, Constantinos-Vasilios *et al*., «You will like it!' Using open data to predict tourists' responses to a tourist attraction», *cit*.

[37] MASSENO, Manuel D., «On the relevance of Big Data for the formation of contracts regarding package tours or linked travel arrangements, according to the New Package Travel Directive», *Comparazione e diritto civile*, Fasc. 4, 2016, pp. 2-14.

[38] RUBINSTEIN, Ira S., «Big Data: The End of Privacy or a New Beginning», *International Data Privacy Law*, Vol 3, Issue 2, 2013, pp, 74-87; also, KEMP, Richard, «Legal aspects of managing big data», *Computer Law and Security Review*, Vol. 30, 2014, pp. 482-491.

[39] SCHWARTZ, Paul; SOLOVE, Daniel, «The PII Problem: Privacy and a New Concept of Personally Identifiable Information», *New York University Law Review*, Vol. 86, 2011, pp. 1814-1894.

its results often impenetrable to laymen. Secret-tracking and decision-making on the basis of profiles are then hidden from any consumer-tourist, which is left without meaningful information about the employed "algorithmic logic". Still, we are attentive to a right to know the "logic of the processing" applied to data (Recital 63, and Arts. 13(2) (f), and 15(1) (h)), respectively.

The GDPR defines profiling in Article 4 as: "[…] *any form of automated processing of personal data consisting of using those data to evaluate certain personal aspects relating to a natural person, in particular to analyse or predict aspects concerning that natural person's performance at work, economic situation, health, personal preferences, interests, reliability, behaviour, location or movements*".

Profiling is an important feature in tourism destinations. Tourism service providers are adapting their serviceable approach to meet the personalization expectation[40]. In fact, data-processing scenarios collect user's input and feedback which are used to build fine-grained premium services and recommender systems in the form of trail packages. The richer the user profile, the higher the temptation for the operators to target a user with unsolicited advertising or to engineer a pricing structure capable to extract as much surplus from the user as possible[41].

The GDPR prohibits automated individual decision-making that significantly affect individuals, Art. 22 (1). Notably, "[…] *analytics based on information caught in an IoT environment might enable the detection of an individual's even more detailed and complete life and behavior patterns.*"[42]

Indeed, developments on consumer-tourist automated profiles, facilitated by big data analytics, can *significantly affect* data subjects[43]. Covert profiling can, in certain cases, lead to unintended consequences:

i. when based on incomplete data, profiling can lead to false negatives, depriving individuals from benefits that they would be entitled to;

ii. "*filter bubbles*" effect[44], according to which data subjects will only be exposed to content which confirms their own preferences and patterns, without any door open to serendipity and casual discovery;

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[40] EDWARDS, Lilian, «Privacy, security and data protection in smart cities: a critical EU law perspective» *cit*.

[41] ENISA 2015 Report, *Privacy and Data Protection by Design – from policy to engineering*.

[42] Art. 29 WP Opinion 8/2014, *Recent Developments on the Internet of Things*.

[43] EDPS Opinion 3/2015, *Europe's big opportunity*, EDPS Recommendations on the EU's options for data protection reform.

[44] PARISER, Eli, *The Filter Bubble: What the Internet is Hiding from You,* New York: The Penguin Press, 2011.

iii. isolation and/or discrimination, e.g., including price differentiation, without providing the individuals the possibility to contest these decisions. In a STD, ML decisions and profiling can lead to promote direct or indirect discrimination decisions through the exclusion/denial of services/goods, e.g. denial of insurances, exclusion from the sale of touristic services or high-end products, shops or entertainment complexes to certain profiled tourists and even other decisions that reflect upon health, creditworthiness, recruitment, insurance risk, etc; it even can lead to discriminate essential utilities for those unwilling to share personal data[45]. In this synopsis, tourists might be discriminated against because they belong to a particular social group, but also, such ascertainment might be based on factors, identified by the analytics, that they share with members of that group.

Therefore, in order to ensure a fair and transparent processing, automated decisions should account all the circumstances concerning the data and not be based on merely de-contextualized information or on data processing results.

In furtherance of this aim, the controller should find ways to build discrimination detection into their ML systems, to prevent inaccuracies and errors assigned to labeled profiles; as referred in Recital 71, the controller should "[…] *use appropriate mathematical or statistical procedures for the profiling, implement technical and organisational measures appropriate to ensure, in particular, that factors which result in inaccuracies in personal data are corrected and the risk of errors is minimised, secure personal data in a manner that takes account of the potential risks involved for the interests and rights of the data subject and that prevents, inter alia, discriminatory effects on natural persons on the basis of racial or ethnic origin, political opinion, religion or beliefs, trade union membership, genetic or health status or sexual orientation, or that result in measures having such an effect*".

2.2 Lawfulness of Processing: Consent, Legitimate Interests, Contract and Public sector

In this sort of intelligent environment, it is dubious to give or withhold our prior consent to data collection[46], as it seems to be absent by design. The awareness that the ubiquitous sensors are so embedded in the destination that they literally "disappear" from the users' sight, so that they will not even be

[45] SCHWARTZ, Paul; SOLOVE, Daniel, «The PII Problem: Privacy and a New Concept of Personally Identifiable Information», *cit.*

[46] KITCHIN, Rob, *Getting smarter about smart cities: Improving data privacy and data security*. Data Protection Unit, Department of the Taoiseach, Dublin (2016), accessible at http://eprints.maynoothuniversity.ie/7242/, consulted on the 02/05/2018.

conscious of their presence and hence consent to the collection, can be envisaged within STD. We can, at some extent, concede that the obtaining of such consent, in STD contexts, would be defined in a mechanical or perfunctory manner, or as a "routinization".

We note also that as for CCTV, ANPR and MAC whilst tracking and sensing, the notice in the form of information signs in the area being surveilled, or on related websites, does not conform to the consent requirements. The issue of the IoT embedded in STD is that its sensorization devices are explicitly designed to be unobtrusive and seamless, invisible in use and unperceived to users[47] and thereupon, users do not hold the opportunity give their unambiguous, informed, specific, explicit, and granular consent[48]-[49]. Therefore, the data controller might have difficulty in demonstrating that the consent was given, and the data subject is not able to withdraw that consent[50].

Still, consent is not yet part of a function specification of IoT devices, and thus, they do not have means to display "*provide fine-tuned consent in line with the preferences expressed by individuals*," because smart roads, trams, tourist office devices are usually small, screenless and lack an input mechanism (a keyboard or a touch screen)[51].

Regarding the amount and assortment of these interactions, it is just too onerous for each data subject to assess their privacy settings across dozens of entities, if any, in order to ponder about the non-negotiable tradeoffs of agreeing to privacy policies without knowing how the data might be used now and in the future, and to assess the cumulative effects of their data being merged with other datasets[52].

Reverting also to other legal grounds, processing personal data relies on "public interest", which can sidestep the need for consent (health, national governmental agencies gather data for e. g. e-Government systems, e-Health). Nevertheless, this possibility should not conceal any eventual "third-party interest".

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[47] SCHWARTZ, Paul M.; SOLOVE, Daniel D., «The PII Problem: Privacy and a New Concept of Personally Identifiable Information» *cit.*

[48] Art. 29 WP Opinion 15/2011, *Definition of Consent*; Art. 29 WP (259 rev. 01) *Guidelines on Consent under Regulation 2016/679*.

[49] MANTELERO, Alessandro, «The future of consumer data protection in the E.U. Re-thinking the 'notice and consent' paradigm in the new era of predictive analytics», *Computer Law and Security Review*, Vol 30, 2014, pp. 643-660.

[50] CAROLAN, Eoin, «The continuing problems with online consent under the EU's emerging data protection principles», *Computer Law and Security Review*, Vol. 32, Issue 3, 2016, pp. 462-473.

[51] Art. 29 WP Opinion 8/2014, Recent *developments on the Internet of Things*.

[52] HABEGGER, Benjamin; HASAN, Omar, *et al*., «Personalization vs. Privacy in Big Data Analysis» *cit*.

Most commercial systems rely on the "legitimate interests" ground, even if they consist in "the vaguest ground for processing"[53], and offers a lot of scope for industry to process data by claiming any deemed necessary "legitimate interest". In fact, the processing must be "necessary" for the legitimate interests and not just *potentially* interesting[54]. It follows that the processing is not necessary if there is any other way of meeting the legitimate interest that interferes less with the people's privacy[55]. Implicitly, the task of balancing commercial interests and user fundamental rights [56] is delegated to the controllers themselves[57].

As for the contractual condition, it may be difficult to show that big data analytics in STD are strictly necessary for the performance of a contract, since the processing goes beyond what is required to sell a product or deliver a service.

2.3 Purpose Limitation

This principle utters that the purpose for which the data is collected must be specified and lawful, Art. 5(1) (b). This principle also prevents arbitrary reuse[58], calling for a "compatibility assessment of the new purpose"[59]. As for a repurpose, personal data should not be further processed in a way that the data subject might consider unexpected, inappropriate or otherwise objectionable[60] and therefore unconnected to the delivery of the service; concretizing, by exposing data subjects to different/greater risks than those contemplated by the initial purposes could be considered as a case of further processing of data in an unexpected manner.

In what refers the compatibility assessment, Article 29 WP states that "*By providing that any further processing is authorized as long as it is not incompatible* […]*, it would appear that the legislators intended to give some flexibility with regard to further use. Such further use may fit closely with the initial purpose or be different. The fact that the further processing is for a different purpose does not necessarily mean that it is automatically incompatible: this needs to be assessed on*

[53] EP Study, Big *Data and Smart Devices and their Impact on Privacy* (2015).

[54] ICO, *Big Data, Artificial Intelligence, Machine Learning and Data Protection*, UK, 2017.

[55] Art. 29 WP Opinion 06/2014, *Notion of legitimate interests of the data controller*.

[56] EDPS Opinion 7/2015, *Meeting the challenges of big data*.

[57] SCHWARTZ, Paul; SOLOVE, Daniel, «The PII Problem: Privacy and a New Concept of Personally Identifiable Information», *cit*.

[58] Art. 29 WP Opinion 03/2013, *Purpose Limitation*, p. 21.

[59] ICO, *Big Data, Artificial Intelligence,…*, *cit*.

[60] Counsel of Europe Guidelines, *Protection of individuals with regard to the processing of personal data in a world of Big Data*, T-PD (2017).

a case-by-case basis". This Opinion sets out an approach to assessing whether any further processing is for an incompatible purpose. Moreover, Recital 50 of the GDPR states that in assessing compatibility it is necessary to take account of any link between the original and the new processing, the reasonable expectations of the data subjects, the nature of the data, the consequences of the further processing, and the existence of safeguards.

Yet, automatic capture of tourism data through sensors might be collected for potentially secondary unauthorized purposes that had not been initially scheduled or still to be discovered, or for profiling, for abusive marketing activity, undermining this way the purpose limitation principle.

Anyway, in practical settings, companies "[…] *repackage data by de-identifying them (using pseudonyms or aggregation) or creating derived data, with only the original dataset being subjected to data minimization. The repackaged data can then be sold on and repurposed in a plethora of ways that have little to do with the original reason for data generation and without the need to give notice or consent to those that the data concerns*"[61].

2.4 Data Minimization: Collection and Retention

The GDPR says personal data shall be "[…] adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed", Art. 5 (1) (c), and so organizations should minimize the amount of data they collect and process, and the length of time they keep the data.

Yet, in substance, smart technology purports the massive collection, aggregation and algorithmic analysis of all the available for various reasons, such as understanding customer buying behaviours and patterns or remarketing based on intelligent analytics.

Big data analytics may discover unexpected correlations that do not retrospectively justify obtaining the data in the first place, for example, between data about people's lifestyles and their credit worthiness. Therefore, organizations need to be clear about which data is deemed to be *necessary, excessive* and *relevant* for the purposes of the processing.

In addition, personal data shall not be kept longer than necessary for the purpose for which it is being processed, as prescribed by the *storage limitation principle,* Art. 5 (1) (e). This principle is becoming part of the lifecycle governance strategy retention policies of companies that defensibly dispose irrelevant data instead of keeping data archived forever. Retention schedules allow unne-

[61] SOLOVE, Daniel, «I've Got Nothing to Hide and Other Misunderstandings of Privacy», *San Diego Law Review*, Vol. 44, 2017, pp. 745–772.

cessary data to be disposed of as it is no longer of business value or needed to meet legal obligations.

2.5 Accuracy and Up-to-date Processing

Results drawn from big data analysis may not always be representative or accurate as sought (Art. 5 (1) (d)), if sources aren´t accurate as well (*i.*e. analysis based on social media resources are not necessarily representative of the whole population at stake) [62].

Organizations employing ML algorithms to discover associations need to consider the distinction between correlations and causations[63], *i.e.*, when there is no *direct cause and effect* between two phenomena that show a close correlation. In these cases there is a risk of drawing inaccurate, but also – and when applied at the individual strata – potentially unfair and discriminatory conclusions[64]. The potential accuracy (or inaccuracy) of any resulting decisions might cause discriminatory, erroneous and unjustified decisions, regarding data subject´s behaviour on health, creditworthiness, recruitment, insurance risk, etc..

Even exercising the "*right to be forgotten*" (Art. 17), where data subjects will have the right for their data to be erased in several situations, for e.g., when the data is no longer necessary for the purpose for which it was collected, or based on inaccurate data, it may be difficult for a business to find and erase someone's data if it is stored across several different systems and jurisdictions[65].

Further, inaccuracy of data endangers the data quality principle and triggers abstract strict liability for damage[66].

The quality of the profiles and the quality of personal data on which they are built, again, seem to matter for the prosperity of the industry, yet another relevant privacy principle.

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[62] ICO, *Big Data, Artificial Intelligence,…*, *cit.*.

[63] ICO, *Big Data, Artificial Intelligence,…*, *cit*.

[64] EDPS Opinion 7/2015, *Meeting the challenges of big data.*

[65] BARTOLINI, Cesare; SIRY, Laurence, «The right to be forgotten in the light of the consent of the data subject», *Computer Law and Security Review*, Vol. 32, 2016, pp. 218–237.

[66] HOEREN, Thomas, *Big Data and Data Quality*, in: HOEREN, Thomas; KOLANY-RAISER, Barbara (Eds.), *Big Data in Context - Legal, Social and Technological Insights*, Heilderberg: Springer, 2018, pp. 1-11.

3. Reflections and Conclusions

This study is novel in having undertaken an initial exploration of the legal implications that technology-enhanced (and empowered) tourism experiences imply to data protection and privacy. The preceding analysis brings out that smart tourism is becoming a big contributor and benefactor of ubiquitous, always-on data-capture about consumer-tourists towards empowered tourism experiences and competitive markets. This data allows the detection and prediction of future behaviours and trends; allows the analysis of development and optimization processes of products/services, retention of customers, and ultimately is useful for future decision-making.

Patently, with new forms of ICTs emerging over the coming years, more types of technology-empowered experiences are expected to flourish further and trigger new challenges to the body of tourism knowledge and wariness therewith.

As for now, the current assumption is that all captured information is extremely valuable and necessary to organizations and will be freely provided by the smart tourists who seek enriched tourism experiences[67].

This extensive collection and processing of personal data in the context of smart tourism destinations using algorithm-driven techniques has given rise to serious privacy concerns, especially relating to the wide ranging electronic surveillance, profiling, and disclosure of private data.

Moreover, the lack of privacy and data protection mindset of engineers and coders working in IoT/cloud business poses a very large problem for the future[68].

In this line, smart technologies used in STD often produce situations of imbalance, where data subjects are not aware of the fundamental elements of data processing and related consequences, being unable to negotiate their information, which leads to a side effect of enhanced information asymmetry[69].

Information asymmetry and inadequate provision of information and data sharing to the public about data use can be seen as hampering tourist trust in STD.

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[67] TALLON, Paul, «Corporate governance of big data: perspectives on value, risk, and cost», *Computer*, Vol. 46, Issue 6, 2013, pp. 32-38.

[68] SCHWARTZ, Paul; SOLOVE, Daniel, «The PII Problem: Privacy and a New Concept of Personally Identifiable Information», *cit*.

[69] MASSENO, Manuel D., *Personal data circulation from the EU to USA and now what for the American Tourism Industry with business in Europe*? 23rd International Tourism Safety Conference, Las Vegas, 2016.

This scenario is particularly acute with "digital natives" or "*millennials*" tourists who have grown up with ubiquitous internet access and share willingness personal information via social media with fewer concerns for how it may be used.

Smart tourism raises big issues with respect to information governance[70] and about correctly deriving the *added* value from information in an open and ubiquitous info-structure. The apprehension here is to understand if the affordances of the technology, the personalized services, and empowered experiences can cope with data protection obligations without a micro-targeting and profiling for unintended uses, safeguarding the right to equal treatment, to non-discrimination and the protection of personal autonomy based on a person's right to control his/ her personal data, that may never be the price paid for an enhanced awareness.

In the forthcoming future, controllers should adopt a precautionary approach[71] in regulating data protection in this field of STD, such as adoption of compliance tools enable STD organizations meeting their data protection obligations while protecting people's privacy rights in a STD context, and they are: anonymization and pseudonymization techniques, privacy policies, data protection impact assessment (DPIA), personal data stores, algorithmic transparency, privacy seals/certification, and privacy by design measures to mitigate the appointed legal risks and implications. It is suggested that STD are to proceed with test prototyping and research before the implementation of new technologies and services in large-scale real-life environments, such as the Mobile Living Lab[72].

As future work, besides addressing related information security issues according to the NIS Directive[73], future research regarding mobile devices and tracking will be needed, following the adoption of the new *ePrivacy* Regulation[74], as well as qualifying the roles of data controller and data processer in the context of STD. Besides, as stated in the Tourism Science literature, tourism, by defini-

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[70] HADAR, Irit; HASSON, Tomer *et al*., «Privacy by designers: software developers' privacy mindset». *Empirical Software Engineering*, Volume 23, Issue 1, 2018, pp 259–289.

[71] ICO, *Big Data, Artificial Intelligence,…, cit*.

[72] EDWARDS, Lilian, «Privacy, security and data protection in smart cities: a critical EU law perspective» *cit*.

[73] Directive (EU) 2016/1148 of the European Parliament and of the Council of 6 July 2016 concerning measures for a high common level of security of network and information systems across the Union.

[74] Proposal of a Regulation of the EP and of the Council concerning the respect for private life and the protection of personal data in electronic communications, COM/2017/010 final - 2017/03 (COD).

tion, is a service-intense industry with a "business network", since it relies on a number of stakeholders for its ability to deliver products and services[75]. Hence, the term *business network* refers to "[…] a collection of inter firm relationships, including alliances, long-term buyer-supplier relationships, and informal collaborations" where each of the actors involved process personal data and therefore their legal obligations should abide to the GDPR.

[75] ROBERTSON, Peter, «An Assessment of Collaborative Governance in a Network for Sustainable Tourism: The Case of RedeTuris», *International Journal of Public Administration*, Vol. 34, Issue 5, 2011, pp. 279-290.

Levelling the odds? Big data analytics in the online gambling industry AND THE APPLICATION OF THE GDPR

Rachel Allsopp[1]

Abstract: In our big data society, as protection of personal data continues to gain ever more prominence in the news, predictive analytics has become ubiquitous in the use of online services, not least in the online gambling industry. Gambling operators have access to a wealth of data, which can be used to make a whole host of predictions, from when a player is most likely to place a bet to the player's favourite football team. Insights gained from this analysis enable operators to provide a more personalised, and arguably commercially effective, service.

The law has previously struggled to balance such technological advancement with the protection of individual privacy and data protection rights. The new General Data Protection Regulation ('GDPR'), however, purports to provide protection to citizens in our increasingly data-driven world by granting additional rights to individuals and specifically addressing profiling and automated decision-making.

This commentary critically examines those rights to determine whether the GDPR succeeds in its goal of protecting individuals from the risks presented by profiling and automated decision-making in an online gambling context. It is concluded that the rights are overly restrictive, lacking in clarity and in actual fact unsuitable for the purpose. More emphasis should be placed on the requirements which promote accountability, such as data protection impact

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assessments, to counteract the significant power imbalance and help level the odds between the individual and the operator.

Keywords: algorithmic decision-making; GDPR; online gambling.

Summary: This paper begins by highlighting the significance of the use of big data analytics in the online gambling industry and introduces the GDPR to present the novel legal landscape which has emerged in response to such technological advancements. The general scope of the GDPR is then illustrated, followed by consideration of one of the key provisions in relation to big data analytics, namely the right not to be subject to solely automated decision-making under article 22. The additional rights which are granted to individuals to enable management of their privacy, including the 'right to an explanation' are then considered in detail. These rights are evaluated throughout the article and it is concluded that there exists a number of limitations which undermine their value in real life. The key issues are that the provisions are very unclear, overly restrictive and not suitable for the average individual, who lacks the time, expertise and resource, to exercise the rights. The provisions are also applied to the online gambling industry throughout the article, further demonstrating their lack of practical value. It is concluded that more importance should be applied to the provisions which promote accountability, such as the requirement for data protection impact assessments, to counteract the significant power imbalance between the individual and the operator.

Introduction

1.1 The EU General Data Protection Regulation ('GDPR') has been hailed as "the most important change in data privacy regulation in 20 years".[2] This new regulation, enforceable from 25 May 2018, aims to protect and empower all EU citizens in relation to their personal data by providing additional rights to individuals to enable them to enforce their fundamental right to privacy.[3] Unfortunately, the lack of clarity in the wording of the regulation combined with the restrictiveness of the provisions threatens the practical value of the rights, which leads to the question of whether it is feasible to expect individuals to have to enforce their rights at all.

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[2] 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 ('GDPR')**.**

EU GDPR Portal: Powered by Trunomi – Home Page https://www.eugdpr.org/ Accessed 27 March 2018.

[3] Convention for the Protection of Human Rights and Fundamental Freedoms (European Convention on Human Rights, as amended) Art. 8.

1.2 In our current, technologically complex, digital age, the collection and analysis of vast datasets using algorithms to identify correlations and predict outcomes, known as big data analytics, is commonplace. The insights generated by these innovative techniques offer appealing benefits to businesses and consumers alike, including targeted advertisements, personalised special offers and user-friendly interfaces; all of which can ultimately promote customer loyalty. In the online gambling industry, where the level of market saturation is high and the product differentiation is relatively low, player retention becomes increasingly important.[4] As a result, the gambling industry has had to be 'light years ahead of other consumer industries in terms of analytics-driven marketing'.[5]

1.3 Being an account-based service, online gambling operators have access to a wealth of data about their players covering the basic personal information provided when an account is opened as well as transactional data collected through the player's use of the site and services.[6] Using this data, it is possible to personalise marketing initiatives based on player preferences, from the device most frequently used to the time of day that the player is most likely to be online. There are also third-party companies which offer services to operators providing access to player data from additional sources, such as social media. This combination provides an even more granular view of each player enabling in-depth profiles to be created, featuring the player's interests and hobbies, past and current locations and even their pay-day.[7]

1.4 The gambling industry is arguably unique, however, in that the activity can become problematic for a proportion of players who go on to develop a gambling disorder.[8] There is therefore a fine line to be drawn between customer retention and encouragement of problematic gambling. This has not gone unnoticed

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[4] As at 31/03/2017, the UK Gambling Commission reported that there were 533 remote casino, betting and bingo UK licences held by 321 operators. UK Gambling Commission, An introduction to the Gambling Commission http://live-gamblecom.cloud.contensis.com/PDF/survey-data/Who-we-are-and-what-we-do.pdf page 2, Accessed 16 April 2018.

[5] BRENNAN, Alex – Online gambling's unique personalisation opportunity http://hudsonsandler.com/online-gamblings-personalisation-opportunity Accessed 13 April 2018.

[6] FINNERAN, Tony - The role of big data and predictive analytics in online gaming and gambling https://www.linkedin.com/pulse/role-big-data-predictive-analytics-online-gaming-toby-finneran/ Accessed 23 April 2018.

[7] MOTT, Charles - Increase your odds of success, with big data http://hellosoda.com/increase-odds-success-big-data/ Accessed 13 April 2018.

[8] Compulsive gambling is a recognised psychiatric disorder under Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. (DSM-5) American Psychiatric Association. American Psychiatric Association Publishing. 2013.

by industry regulators, including the United Kingdom Gambling Commission ('UKGC') which, as a licence condition, requires that operators put into effect policies and procedures for identifying customers who are at risk of developing a gambling problem, making use of all relevant sources of information.[9] Operators are therefore encouraged to apply the sophisticated use of big data analytics to look for markers which may indicate a gambling issue.

1.5 In addition to the risk of problematic gambling, there remains the general threat to the privacy of all customers. At what point does the granular level of personalisation achieved through big data analytics become intrusive, compromising the individual's right to privacy and protection of their personal data?

1.6 The GDPR seeks to specifically address technological advances such as this by incorporating specific provisions in relation to profiling and automated decision-making, as well as providing individuals with additional rights to protect their personal data. Unfortunately, the rights are unnecessarily restrictive and ambiguous, and as a result they offer little practical use to individuals who lack the time, resource and expertise to enforce them. It is questionable, therefore, whether the GDPR succeeds in empowering individuals in the way that it aspires to.

1.7 This paper will examine the way in which the new regulation applies to the processing of personal data in the context of big data analytics in the online gambling industry. It will firstly outline the scope of the application of the GDPR before considering the specific provisions regarding automated decision-making and the limitations contained therein. The paper will also consider the provisions and individual rights which are applicable generally, again identifying the issues that arise. The application of the regulations to online gambling will be highlighted throughout, demonstrating the existing limitations to the practical application of the rights. Finally, a more appropriate approach will be suggested through the use of data protection impact assessments to shift the accountability from the individual to the organisation.

[9] UKGC - Licence conditions and codes of practice (January 2018) ('LCCP') http://www.gamblingcommission.gov.uk/PDF/LCCP/Licence-conditions-and-codes-of-practice-April-2018.pdf SR Code 3.4.1 Accessed 13 April 2018.

2. Big Data Analytics in Online Gambling

2.1 As discussed above, online gambling operators have access to a large volume of data about their players as a result of the account-based nature of the service. With this data, operators can use algorithms and predictive analytics to become personally acquainted with their players on a granular level. Transactional data can reveal player preferences on a multitude of areas, such as type of gaming (e.g. sports betting, bingo) betting category (e.g. football, horse racing) a particular game, time of day, day of the month, device, and method of communication. This can be used to tailor marketing, make relevant recommendations and personalise website content for each player.[10] Third-party services are also available, providing access to further customer data from different sources, such as social media, allowing acutely detailed player profiles to be generated.[11]

2.2 Big data analytics is also used for protective measures, such as identification of players who may be underage or players who are susceptible to the development of a gambling disorder, and for fraud prevention.[12]

2.3 While there are clear advantages of this innovative technology, including satisfied customers and a safer gambling environment, there is also a concern that this use of data can be too intrusive, jeopardising the rights of individuals to privacy and data protection. The potentially harmful impact of algorithms on society has been widely commented on, in particular when concealed in a 'black box' of secrecy apparently beyond any form of scrutiny.[13] In recent times, for instance with the Cambridge Analytica 'scandal' involving the Facebook data of over 87 million users being used to potentially influence political elections,

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[10] deltaDNA - Gamification marketing with limited data https://deltadna.com/resources/gamification-marketing-limited-data/ Accessed 23 April 2018.

[11] MOTT, Charles, *op. cit.*

[12] Remote Gambling Association - Behavioural analytics: Good practice guidelines (February 2018) https://www.rga.eu.com/wp-content/uploads/Final-RGA-Behavioural-Analytics-Guidelines-Feb-2018.pdf. Accessed 13 April 2018.
UKGC - Gambling regulation and the General Data Protection Regulation (GDPR).
Information note 2018 ('UKGC GDPR Note') http://live-gamblecom.cloud.contensis.com/PDF/Gambling-regulation-and-GDPR.pdf Accessed 23 April 2018.

[13] PASQUALE, Frank - *The Black Box Society: The Secret Algorithms that Control Money and Information*, 1st edn, Cambridge, MA, USA, Harvard University Press, 2015.

it seems to be becoming more apparent to the public how little people actually know about how their data is being used.[14]

2.4 Against this backdrop, the GDPR sets out its overarching principles, including transparency, accountability and fairness, as well as specific provisions regarding profiling and automated decision-making, in an effort to directly address these technological advancements and protect privacy in this modern, data-driven landscape.

3. Scope of the GDPR

3.1 Application. The territorial scope of the regulation is wide, applying to all establishments based in the European Union as well as any processing of the personal data of EU citizens, regardless of the location of the organisation (provided that the processing relates to the offering of goods or services to, or the monitoring of the behaviour of data subjects in the EU).[15] Moreover, the regulation extends the scope of previous data protection laws to cover the actions of data processors as well as data controllers.[16]

3.2 In an online gambling context, this means that as well as applying to all operators based in the EU or processing the data of EU citizens, the GDPR will also apply to third-party companies who process data on behalf of operators, for example: game providers (which create the games that players use to gamble), software providers (which provide the technical platform infrastructure to deliver the gambling websites) and marketing affiliates.

3.3 Personal data. The definition of 'personal data' remains largely unchanged from previous legislation, encompassing any information relating to an identified or identifiable natural person ('the data subject') through direct or indirect means.[17] In an effort to bring the rules up to date technologically, however, the

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[14] BROCKES, Emma - Zuckerberg certainly convinced me – to log off Facebook for good that is https://www.theguardian.com/commentisfree/2018/apr/12/mark-zuckerberg-log-off-facebook-congress Accessed 13 April 2018.
CHEN, Brian - I downloaded the information that Facebook has on me. Yikes https://www.nytimes.com/2018/04/11/technology/personaltech/i-downloaded-the-information-that-facebook-has-on-me-yikes.html Accessed 13 April 2018.

[15] GDPR Art. 3.

[16] GDPR Art. 3.

[17] GDPR Art. 4(1).

regulation specifically covers online identifiers such as location data, IP addresses, device IDs and cookie identifiers.[18] Even where the data alone is not enough to identify a person, if it has the potential to identify an individual in combination with other data, taking into account all means reasonably likely to be used, then it will be categorised as personal data.[19]

3.4 Personal data may become non-personal data and fall outside of the scope of regulation where is has been anonymised. Many businesses, however, simply remove obvious identifiers, such as the name, and consider the data to be anonymised though it is clear that this is not always the case. There often exists the potential for re-identification,[20] particularly in the increasingly popular 'smart' environment deriving from the Internet of Things where apparently mundane, raw data can be easily reconnected to individuals.[21] Personal data which has been subjected to pseudonymisation will still fall under the remit of the GDPR to the extent that an individual may reasonably be identified through use of additional information, though in an effort to encourage the use of pseudonymisation as a safeguard it attracts certain incentives, for example exclusion from mandatory breach notification to a data subject.[22]

3.5 Online gambling operators have access to huge volumes of personal data. This includes the obvious categories such as name, address and date of birth, as well as digital identifiers such as email address, IP address, location data and cookie identifiers, where the potential to identify an individual exists in combination with other information.[23]

3.6 This wide interpretation of personal data could be seen to expand the rights of the individual in that it confirms the increased scope of protection beyond the traditional forms of personal data; however, there remains a lack of clarity in relation to data associated with a group. Where, for example, profiles are generated

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[18] GDPR Art. 4(1), Recital 30.

[19] GDPR Recital 26.

[20] OHM, Paul «Broken Promises of Privacy: Responding to the Surprising Failure of Anonymization», *UCLA Law Review*, 57 (2010) 1701-1777, p. 1716.

[21] EDWARDS, Lillian and VEALE, Michael «Slave to the Algorithm? Why a 'Right to an Explanation' is Probably Not the Remedy you are Looking For'», *Duke Law and Technology Review* 16 (2017) 18-84, p.34.

[22] GDPR Art. 25 and 34, Recital 26.

[23] See for example: Skybet Cookies Policy and Privacy Notice https://support.skybet.com/s/article/Cookies-Policy-Privacy-Notice Section: Collecting Information About You. Accessed 23 April 2018.

for a collection of individuals with similar interests, there does not appear to be any clear protection for that 'algorithmically assembled' group under data protection law.[24] The protection under the GDPR will only become applicable at the final stage where a decision based on group profiling is applied to an individual,[25] an approach which is arguably unhelpful given that it is often more feasible or appropriate for a group to assert its rights.[26]

3.7 Nonetheless, where data is obviously non-personal, or has been successfully anonymised, it falls outside of data protection law despite having the ability to affect individuals. This is evident, for instance, with clickstream analysis; the process of collecting and analysing aggregate data tracking the users' actions on a website. Operators can use this data to inform decisions on page layout and manipulate the users' actions in a more profitable way,[27] perhaps to encourage further spend or discourage the use of responsible gambling tools. It is submitted that this use of data holds the ability to adversely affect individuals though there is no clear protection against this form of processing in present data protection law. Of course, there are countless situations where the processing of non-personal data holds no potential for harm and it would be too severe to apply data protection controls to these situations, though some middle ground would be useful to acknowledge that non-personal data has the potential to impact users as well.

3.8 What remains clear is that any form of processing of any personal data will be subject to the provisions of the GDPR. 'Processing' is widely defined as any operation which is performed on personal data whether or not by automated means and essentially covers anything that an organisation does involving personal data, from storage to erasure.[28] Use of personal data for predictive analytics, including profiling and automated decision-making, will certainly fall within the definition and these processes are explicitly referred to in the regulation.

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[24] MITTELSTADT, Brent «From Individual to Group Privacy in Big Data Analytics» *Philos. Technol.* 30 (2017) 475-494 p. 476.

[25] GDPR Recital 26.

[26] MANTELERO, Alessandro, «Personal Data for Decisional Purposes in the Age of Analytics: From an Individual to a Collective Dimension of Data Protection», *Computer Law & Security Review* 32 (2016) 238–255 p. 245.

[27] EDWARDS, Lillian and VEALE, Michael, *op. cit.,* p. 33.

[28] GDPR Art. 4(2).

3.9 Profiling is defined as 'any form of automated processing of personal data consisting of the use of personal data to evaluate certain personal aspects relating to a natural person, in particular to analyse or predict aspects concerning, for example, that natural person's …preferences, interests, reliability, behaviour, location or movements'.[29] Importantly, the profiling need not be solely automated; to fall within the definition, the processing must involve some level of automated processing, however, human involvement will not necessarily preclude the application of the regulation.[30] In broad terms, therefore, profiling involves the collection of data about individuals and evaluation of characteristics or behaviour patterns in order to analyse the results and make predictions, for example in relation to interests or future behaviour.[31]

a) Example: An operator collects transactional data on each player's top 3 most frequently played games. By cross referencing this data with other players, each player is placed into a category of players with interests in the same games. The operator uses this to identify a pool of games, which are popular with players that have similar interests.

3.10 Automated decision-making is the ability to make decisions based solely on automated, technological means without meaningful human involvement.[32] The Article 29 Data Protection Working Party ('WP29'), in its guidance, provides that automated decision-making is a process, which can be carried out with or without profiling, although it stipulates that the two activities are not necessarily separate.[33] Automated decisions can also be based on any type of data, such as that which has been provided by individuals, observed, derived or inferred based on existing data.[34]

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[29] GDPR Art. 4(4).

[30] Article 29 Data Protection Working Party, Guidelines on Automated Individual Decision-Making and Profiling for the Purposes of Regulation 2016/679, last revised and adopted on 6 February 2018 ('WP29 Guidelines'), p.7.

[31] WP29 Guidelines, *op. cit.,* p. 7.

[32] GDPR Art. 22; WP29 Guidelines, *op. cit*., p. 8.

[33] The Article 29 Working Party is an advisory body set up under article 29 of Data Protection Directive. The body is composed of representatives from the Member States' data protection authorities, the European Data Protection Supervisor and the European Commission.

[34] WP29 Guidelines, *op. cit.,* p. 8.

a) Example: The operator from the above example uses the data to automatically display game recommendations on a personalised home page for each player when they log into their account, based on the interests of other players in the same category.

3.11 The GDPR recognises the risks to individual privacy that automated decision-making presents by incorporating the 'right not to be subject to a decision based solely on automated processing' under article 22. Moreover, for profiling and decision-making which is not solely automated, there are a number of provisions which operators must adhere to. These provisions are set out below.

4. Solely Automated Decision-making

4.1 Under article 22, a data subject has the 'right not to be subject to a decision based solely on automated processing, including profiling, which produces legal effects concerning him or her or similarly significantly affects him or her'.[35] This amends the existing right under the Data Protection Directive not to be subject to a decision based on automated processing which produces legal effects or significantly affects the data subject.[36]

4.2 There has been discussion as to whether this provision represents a prohibition on automated decision-making or whether it simply provides a right to oppose.[37] The WP29 has, however, clarified that the provision amounts to a general prohibition of solely automated decision-making, rather than a right that the data subject must actively invoke.[38]

4.3 Decision based solely on automated processing. For article 22 to apply, the decision must be based *solely* on automated processing, meaning there must be no *meaningful* human involvement in the decision-making process. A level of

[35] GDPR Art. 22(1).

[36] Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data ('Data Protection Directive') Art. 15.

[37] NOTO LA DIEGA, Guido «Against the Dehumanisation of Decision-Making. Algorithmic Decisions at the Crossroads of Intellectual Property, Data Protection, and Freedom of Information», *JIPITEC* 9(1) (2018) (forthcoming) Section D.I.

[38] WP29 Guidelines, *op. cit*., p. 19,

human involvement that has no authority or competence to influence the decision is not sufficient and the decision would be categorised as solely automated.[39]

a) Example: An operator identifies that players who most commonly bet between the hours of midnight and 2am present the highest risk of developing a gambling disorder and therefore automatically suspends all accounts that are active during this time.

4.4 The requirement for the decision to be *solely* automated arguably results in unnecessary narrowing of this protection, given that in reality decisions which affect an individual in such a significant way are not usually fully automated.[40] Indeed gambling operators, as in other commercial contexts, are understandably interested in retaining their customers and so any significant decision which would, for example, involve closure of an account is unlikely to be made in an automated way.

4.5 It is also not entirely clear what is meant by a 'decision'. Recital 71 unhelpfully provides that data subjects 'should have the right not to be subject to a decision, which may include a measure', and provides relatively obvious examples such as automatic refusal of an online credit application or e-recruiting practices without any human intervention'. It remains uncertain, therefore, whether this covers the product of an algorithmic system, or another interim step in the algorithmic process.[41] The fact that the decision is required to have a legal or similarly significant effect, however, does suggest that it would be rare for an interim measure to qualify under article 22.[42]

4.6 Moreover, determining whether the necessary level of human involvement has been met is not always going to be straightforward, particularly for a data subject. Despite the WP29 guidance, there is still a significant grey area concerning the required level of human involvement, for example where the decision is made in an automated way but subsequently reviewed by a human.[43] It would be unreasonable to expect a lay individual to navigate this in order to enforce their right not to be subject to automated decision-making.

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[39] WP29 Guidelines, *op. cit.,* p. 2.

[40] EDWARDS, Lillian and VEALE, Michael, *op. cit.,* p. 45.

[41] EDWARDS, Lillian and VEALE, Michael, *op. cit.,* p.46.

[42] NOTO LA DIEGA, Guido, *op. cit.,* Section D.I.

[43] NOTO LA DIEGA, Guido, *op. cit.,* Section D.I.

4.7 Legal or similarly significant effect. The decision must also have a 'legal' or 'similarly significant' effect on the individual to be subject to prohibition. The decision must therefore affect a legal right, such as cancellation of a contract, or have an effect which is similarly significant, for example refusal of a credit application.[44] This is narrower than the existing provision under the Data Protection Directive given that the effect of the decision must be legal or *similarly* significant, whereas previously the decision only had to significantly affect the individual.[45] These terms are not defined, though it is suggested that the terminology used infers that the provision will only apply to 'serious impactful events'.[46] The WP29 guidelines suggest that to have a significant effect, the decision must have the potential to:

- 'significantly affect the circumstances, behaviour or choices of the individuals concerned;
- have a prolonged or permanent impact on the data subject; or
- at its most extreme, lead to the exclusion or discrimination of individuals.'

4.8 While on the face of it, the new regulation provides some clarity by explicitly extending the protection to profiling, the undefined terminology results in uncertainty as to its application. It is therefore difficult to see how a data subject could reasonably avail themselves of the protection against automated decision-making without further examples or case law.

4.9 In relation to marketing based on automated decisions through profiling, it seems unlikely that the majority of cases would have a sufficiently significant impact to be prohibited by article 22, particularly where based on a broader profile. Certain characteristics such as the intrusiveness of the profiling process, the expectations and wishes of the individual, the delivery of the advert, and the use of knowledge of the data subject's vulnerabilities may, however, require closer consideration. The guidelines highlight that processes that have an insignificant impact on the majority of individuals may still affect some vulnerable groups of people in a way which has a significant impact, for example where a person

[44] WP29 Guidelines, *op. cit.,* p. 21; GDPR Recital 71.

[45] Data Protection Directive Art. 15; NOTO LA DIEGA, Guido, *op. cit.,* Section D.I.

[46] WP29 Guidelines, *op. cit.,* p.21.

with known financial difficulties is targeted with adverts for high interest loans.[47] One of the main criticisms of algorithmic decision-making is that it presents a serious risk of discrimination to individuals and there is an abundance of commentary demonstrating the existence of this risk with examples such as denial of credit, employment or insurance.[48] Article 22 takes steps to prohibit this kind of discriminative automated decision-making, though in reality it is likely that this type of processing would not meet the key principle of fairness and would in any event be unlawful under the GDPR.[49]

a) Example: An operator profiles the average deposit total of each player during the initial 6 weeks of the account being opened. Any players who do not deposit at least £50 during this time will have their accounts automatically closed.

4.10 This example further demonstrates the restrictiveness of this provision, particularly in a commercial setting. In cancelling a contract, the effect would be legal as well as potentially discriminative; however, in reality such an extreme action is highly unlikely given that operators generally do not wish to lose players (even less profitable ones). It is difficult therefore to imagine a less extreme instance where solely automated decisions would be taken which have a legal or similarly significant impact, particularly where such a decision would not already be prohibited as unfair (for example targeting players who have a propensity to develop a gambling problem with bonuses). The practical value of article 22 is therefore questionable given its apparent lack of wider applicability and authors have commented that this provision of the GDPR is likely to have the least effect in practice in the context of big data.[50]

4.11 That is not to say that where article 22 does not apply, there are no obligations in relation to automated processing of personal data. It must still comply with the general provisions regarding processing which are discussed in further detail below.

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[47] WP29 Guidelines, *op. cit.,* p.20.

[48] PASQUALE, Frank, *op. cit.*
O'NEIL, Cathy - *Weapons of math destruction: How big data increases inequality and threatens democracy*, 1st edn, New York, NY, USA, Crown Publishing Group, 2016.

[49] GDPR Art. 5(1)(a).

[50] ZARSKY, Tal «Incompatible: The GDPR in the Age of Big Data», Seton Hall L. Rev. 47 (2017) 995-1020, 1018.

4.12 Exceptions. There are three exceptions where a data controller may make automated decisions which have a legal or similarly significant effect on a data subject. These are where the automated decision-making is:

a) necessary for the performance of or entering into a contract;

b) authorised by law, with suitable safeguards in place to protect the rights and freedoms of the individual; or

c) based on the data subject's explicit consent.[51]

4.13 The contractual exception should be interpreted narrowly, given that the decision-making must be *necessary*; it is therefore unlikely that the majority of forms of data analytics will qualify for this exception.[52] Even where the automated processing is used for greater consistency, increased fairness to reduce the risk of non-payment or improve efficiency, these considerations are not sufficient to meet the requirement. Furthermore, if a less privacy intrusive method is available, then the processing will not be necessary and therefore not permitted under this exception.[53] This results in the exception being restricted, which is welcomed to strengthen the protection under article 22.[54]

4.14 Unfortunately, limited guidance is provided on the exception for algorithmic decisions authorised by law, save that it has been suggested that this could be interpreted by national authorities as wider than just fraud or tax evasion purposes.[55] In the context of online gambling, it seems likely that where operators use big data analytics to make solely automated decisions for the purposes of combatting fraud, money laundering and problem gambling they may be able to rely on the article 22(2)(b) exception.[56] For example, the UK Gambling Commission requires, as a licence condition, that operators have procedures in place to allow for self-exclusion and to detect and combat underage and problem gambling.[57] The UKGC expects that operators "*obtain and analyse data for the pur-*

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[51] GDPR Art. 22(2).

[52] WP29 Guidelines, *op. cit.,* p. 13. This is explained in the context of the legal basis of processing under article 6(1)(b); however, the principle is transferable.

[53] WP29 Guidelines, *op. cit.,* p.23.

[54] NOTO LA DIEGA Guido, *op. cit.,* Section D.II.

[55] GDPR Recital 71, NOTO LA DIEGA, Guido, *op. cit.,* Section D.II.

[56] GDPR Recital 71; UKGC GDPR Note, *op. cit.,* p. 3.

[57] LCCP, *op. cit.,* SR Code 3.4.1.

poses of ensuring that their social responsibility policies and procedures are fit for purpose, taking into account the state of the art and currently available techniques for identifying and minimising problem gambling".[58] Where big data analytics is used for this purpose, it is therefore likely that it will be permitted to the extent that it is necessary (which of course is not always straightforward to determine but should be interpreted narrowly, as demonstrated above).

4.15 Similarly, it is regrettable that 'explicit consent' is not defined in the regulations. It is clear from the terminology that 'explicit consent' should be more onerous than the general form of consent as a legal basis for processing under article 6. What 'explicit consent' should look like, however, is ironically less than explicit. The WP29 suggests that the controller should obtain an express statement of specific consent, in writing, signed by the data subject where possible for evidential purposes. Electronic equivalents could also be valid, such as an electronic form, email, a scanned signed document or an electronic signature.[59]

4.16 More detailed information is provided regarding the general form of consent as a lawful basis for processing.[60] In order for consent to be valid, the data subject must signify their agreement to the processing of personal data for one or more specific purposes in a way which is:[61]

- Clear;
- Specific;
- Informed;
- Unambiguous; and
- By a statement or clear affirmative action.[62]

4.17 The consent needs to be in clear, plain language in an easily accessible form; the user needs to have enough information to be able to understand exactly what they are consenting to, how the data will be used and the consequences of the

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[58] UKGC GDPR Note, *op. cit.* p. 5.

[59] Article 29 Data Protection Working Party Guidelines on Consent under Regulation 2016/679 Adopted 28 November 2017 ('Consent Guidelines') p. 18.

[60] GDPR Art. 6(1)(a).

[61] GDPR Art. 6(1)(a).

[62] GDPR Art. 4(11).

processing.[63] The consent itself can take a number of forms, such as: a written statement, including those taken by electronic means, ticking a box on the website, choosing technical settings, or other conduct as long as it clearly represents the user's affirmative agreement to the proposed processing of their data. Pre-ticked boxes, silence or inactivity will not meet the criteria for valid consent.[64] The consent must also be freely given, which means that the user must have a free and genuine choice as to whether to provide consent and be given the option of refusing or withdrawing consent without detriment.[65] Consent is presumed not to be freely given where it does not provide separate, distinct options for different purposes and data processing operations.[66] For example, separate options for consent should be provided in order to send personalised marketing communications and to share profile information with third party game providers for personalised games.

4.18 While the theory of consent is arguably well defined, in practice the limitations of the consent model are well documented.[67] Online consent is very often obtained by simply providing users with a link to a privacy policy at the time of registration and a request that they tick a box to confirm acceptance of the terms.[68] Without ticking the box, users cannot proceed with the registration and indeed many notices state that if the terms are not accepted, the user should not continue to use the service.[69] It is therefore difficult to see how an individual would ever be able to give free, genuine consent in commercial transactions, where the significant power imbalance between the individual and the company means that there is no chance to negotiate the terms, which are essentially provided on a 'take it or leave it' basis.[70] Moreover, if this model is utilised by most providers in the industry, who operate under broadly similar terms of use, how can users have a genuine choice even with the existence of multiple different

[63] GDPR Art. 7(2), Recital 42; WP29 Guidelines, *op. cit.,* p. 13.

[64] GDPR Recital 32.

[65] GDPR Article 7(4), Recital 42.

[66] GDPR Recital 43; Consent Guidelines, *op. cit.,* p.10.

[67] See, for example: EDWARDS, Lillian and VEALE, Michael, *op. cit.,* p. 33.
JOERGENSEN, Rikke Frank, «The unbearable lightness of user consent», *Internet Policy Review* 3(4) (2014) 1-14.

[68] EDWARDS, Lillian and VEALE, Michael, *op. cit.,* p. 66.

[69] See for example Skybet Cookies Policy and Privacy Notice https://support.skybet.com/s/article/Cookies-Policy-Privacy-Notice Section: 'Privacy Rights: Can I object to having my personal information used in this way?' Accessed 25 April 2018.

[70] EDWARDS, Lillian and VEALE, Michael, *op. cit.,* p. 66.

operators? Nonetheless given the lack of clarity as to what explicit consent should look like, it remains to be seen whether it will result in more meaningful consent being obtained, albeit in relatively restricted circumstances.

4.19 Safeguards. In order to rely on an exception under article 22(2), sufficient safeguards must be in place for the processing to be lawful.[71] Controllers should have procedures in place to continuously assess and audit algorithms, to review accuracy and relevance of automated decisions, and to prevent errors, bias, inaccuracy and discrimination.[72] This is commendable as it encourages operators to be more accountable for data privacy issues by implementing a privacy by design approach, which moves the responsibility away from the individual. It is regrettable, however, that this level of detail is only contained in the recitals and WP29 guidance, rather than in the binding content of the regulation.

4.20 In addition to the internal safeguards, which an organisation should have in place, individuals must have access to certain rights, including the rights to human intervention, to express his or her point of view, to obtain an explanation of the decision and to challenge the decision.[73] The data subject must also be provided with specific information regarding the processing and the decision, in order to be able to properly challenge it.[74] These rights will be considered in the next section.

5. Rights of the Individual

5.1 Right to human intervention. In the event that a solely automated decision is taken, which legally or similarly significantly affects an individual, but which can be justified on the basis of one of the three exceptions, that individual will be entitled to contest the decision and demand human intervention by the controller.[75] This extends the previous right of data subjects to express their viewpoint,[76] and means that controllers must put in place a procedure to allow individuals to appeal the automated decision, with meaningful human involvement in order to

[71] GDPR Recital 71; WP29 Guidelines, *op. cit.,* p. 28.

[72] GDPR Recital 71.

[73] GDPR Recital 71.

[74] GDPR Recital 71, WP29 Guidelines, *op. cit.,* p. 27.

[75] GDPR Art. 22(3).

[76] Data Protection Directive Art. 15(b).

ensure this effective right of defence.[77] Unfortunately, it is not clear exactly what steps should be taken by the controller once the individual seeks to invoke this right. The WP29 guidelines suggest that the review should be carried out by a human with the authority to change a decision and should take into account all relevant data, including any additional information provided by the individual.[78] It is submitted that this is a positive step since it provides individuals with an active right against the automated decision, rather than simply being provided with information. It also requires meaningful human intervention, which is generally considered desirable as compared to solely automated processing, though it does not necessarily guarantee that the outcome of the decision will change.[79] It is unfortunate, though, that this right is only available in relation to those rare decisions which fall under article 22 and there is no obligation for controllers to offer the right in relation to automated decisions which do not meet the restrictive criteria under article 22.

5.2 Right to an explanation. It has been submitted that the rights provided to data subjects in the context of automated decision-making, namely the right to be informed and the right to access together constitute a 'right to an explanation'.[80] Interestingly, this apparent right is referred to in the non-binding recitals though there is no acknowledgement within the wording of the regulation.[81] This has led other commentators to dispute the existence of such a right.[82] The apparent right to an explanation stems from the key principle of transparency in processing under article 5(1)(a), which is more onerous in the context of automated decision-making under article 22. These transparency obligations are entirely new to EU regulation; adding to the existing right of access under the

[77] NOTO LA DIEGA, Guido, *op. cit.,* Section D.II.1.

[78] WP29 Guidelines, *op. cit.,* p. 27.

[79] NOTO LA DIEGA, Guido, *op. cit.,* Section D.II.1.

[80] See, for example: GOODMAN, Bryce and FLAXMAN, Seth, «European Union Regulations on Algorithmic Decision-Making and a "Right to Explanation"», *ICML Workshop on Human Interpretability in Machine Learning* (2016).
EDWARDS, Lillian and VEALE, Michael, *op. cit.,* p. 20.
SELBST, Andrew and POWLES, Julia, «Meaningful Information and the Right to Explanation», *International Data Privacy Law* 7(4) (2017) 233–242.

[81] GDPR Recital 71.

[82] EDWARDS, Lillian and VEALE, Michael *op. cit.,* p. 44.
WACHTER, Sandra et al, «Why a Right to Explanation of Automated Decision-Making Does Not Exist in the General Data Protection Regulation», *International Data Privacy Law* 7(2) (2017) 76–99.

Data Protection Directive.[83] To satisfy the data subject's right to be informed and ensure that the processing is fair and transparent, controllers must provide specific, easily accessible information about the automated decision-making.[84] This must include details of:

- the fact that they are engaging in this activity;
- meaningful information about the logic involved; and
- the significance and envisaged consequences of processing.[85]

5.3 This information must be provided at the time of the data collection.[86] Where the data is obtained indirectly (for example where inferred from other data), the information must be provided within a maximum of one month of the data being obtained.[87] If the personal data are being used to communicate with the data subject or are being disclosed to another recipient then the data subject must be notified by the time of the first communication or disclosure.[88]

5.4 Clearly, the mathematical models and algorithms used as part of the predictive analytics are complex in their nature and can therefore be difficult to explain in any meaningful way. Recital 58, however, makes clear that technological complexity is not an excuse for failing to meet this obligation and provides that simple language and visualisation where appropriate should be employed so that the data subject is able to understand the reasons for the decision.[89] The information should tell the data subject, in simple terms, the rationale behind the decision and the criteria used in reaching the decision in addition to the general transparency requirements under articles 12-15.[90] As for informing the individual of the significance and envisaged consequences of the processing, the guidelines suggest that real, tangible examples of the types of possible effects

[83] Data Protection Directive Art. 12(a) This included access to the logic involved.

[84] GDPR Art. 13(2)(f) and 14(2)(g).

[85] WP29 Guidelines, *ob. cit.,* p. 25.

[86] GDPR Art. 13.

[87] GDPR Art. 14(3)(a).

[88] GDPR Art. 14(3)(b) and (c).

[89] GDPR Recital 58.

[90] WP29 Guidelines, *op. cit.,* p. 25.

should be provided, and visual techniques could make the information more meaningful to the data subject.[91]

5.5 The data subject is also entitled to a right of access to all of the personal data that is held about them by the controller.[92] In the context of profiling, this will include the personal data used as input for the profile, the categories of profiling and details of the profile itself including any segments which the data subject has been placed into.[93] The specific information outlined above regarding automated decisions must also be provided.[94] This means that, in addition to the explanatory information provided to all individuals before their data is processed, individuals can become aware of a decision made about him or her by exercising their rights of access. Pursuant to this right, the controller is obliged to provide a free copy of the personal data held about the individual.[95] The data should be provided in an electronic format unless otherwise requested and where possible, data subjects should be able to remotely access a secure system providing direct access to their data.[96] The guidelines do clarify, however, that the communication needs to provide general information on the envisaged consequences of the processing (including factors taken into account and their relative weighting); however, there is no requirement to give an explanation of a particular decision.[97]

5.6 Paradoxically, the provision purporting to provide clarity to individuals employs the term 'meaningful', which is extremely open to interpretation. It can be assumed that the average individual will not be a computer scientist who can understand the algorithm itself, which suggests that the information should therefore be provided using non-technical language. It has, however, been argued that the data subject should also be provided with the algorithm itself for evidential purposes, in order to obtain expert evidence and fully exercise their right to challenge the decision.[98] Others suggest that an interactive model allowing the data subject to explore the algorithm would be more informative and therefore

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91 WP29 Guidelines, *op. cit.,* p. 26.

92 GDPR Art. 15.

93 GDPR Recital 63; WP29 Guidelines, *op. cit.,* p. 17.

94 GDPR Art. 15(1)(h).

95 GDPR Art. 15(3).

96 GDPR Art. 15(3), Recital 63.

97 WP29 Guidelines, *op. cit.,* p. 27.

98 NOTO LA DIEGA, Guido, *op. cit.,* Section D.III.

meaningful.[99] Nonetheless, given that the right to be informed arises at the time of data collection and since there is no requirement for an explanation of a particular decision to satisfy the right to access, it is difficult to see how anything more than general information about the algorithm can be provided. This then begs the question of how meaningful this information reasonably be.[100]

5.7 Another drawback of this right stems from the caveat provided to organisations in article 15(4), which allows a limited form of protection to the rights of others, including trade secrets or intellectual property rights.[101] This could apply particularly in relation to algorithmic decision-making where the method used is commercially sensitive; however, it is not entirely clear how far organisations will be able to extend this argument. It is evident, however, that organisations will not be able to rely on the protection of their trade secrets to refuse to provide information to the data subject, though it may further affect the meaningfulness of the information provided.[102]

5.8 Whilst the specific obligations in relation to automated decision-making will only apply to situations covered by article 22, organisations will still have to comply with the general principle of transparency for other forms of big data analytics, including profiling. Explicitly, where personal data are used for profiling, the data subject should be informed of the existence of the profiling and any automated decisions based on the profiling and be given access to the data that is held about them (though there is no requirement for 'meaningful information about the logic and consequences').[103] The data subject should also be informed of whether there is an obligation to provide their personal data and of the consequences of not providing such data.[104]

5.9 The principle of transparency is an attractive one, particularly where one of the main criticisms of algorithmic decisions is their opacity; the processing generally goes on beneath the surface without being overtly obvious to the individual. Nonetheless, in the interests of looking beneath the surface, it must be asked whether the 'right to an explanation' is the most appropriate remedy for the average individual. Arguably, most individuals are unlikely to have the time,

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[99] EDWARDS, Lillian and VEALE, Michael, *op. cit.,* p. 81.

[100] EDWARDS, Lillian and VEALE, Michael, *op. cit.,* p. 52.

[101] GDPR Art. 15(4).

[102] WP29 Guidelines, *op. cit.,* p. 17.

[103] GDPR Art. 13(f) and 14(g); WP29 Guidelines, *op. cit.,* p. 16-17.

[104] GDPR Recital 60.

resources or expertise to meaningfully make use of this right, particularly given the uncertainties identified.[105] Moreover, it is submitted that, for the types of decisions that most individuals would invest the time, energy and resource to dispute, they are less interested in obtaining an explanation about the decision and would actually prefer that the decision had not been taken in the first place.[106] In reality, it seems more likely that an individual would just choose to open a new account with a different operator, given the choice of online gambling providers available, and either close the offending account or leave it dormant. Expecting users to manage their own privacy by relying on an ambiguous right risks creating a "transparency fallacy", similar in character to the free consent issues described above, where the right which purports to empower the individual is itself meaningless and has no power at all.[107]

6. Additional rights

6.1 In addition to the above rights, individuals are entitled to exercise the following additional rights regardless of whether the processing is subject to article 22.

6.2 Right to object. Under article 21 individuals are entitled to a right to object to processing, corresponding with the existing right under the Data Protection Directive.[108] This right is available to individuals on any grounds relating to his or her personal situation, however only in the limited circumstances where the processing of personal data is justified under one of the following lawful bases:[109]

a) the processing is necessary in the public interest or in exercise of official authority;[110] or

b) the processing is necessary for the legitimate interests of the controller or a third party.[111]

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[105] EDWARDS, Lillian and VEALE, Michael, *op. cit.,* p 67.

[106] EDWARDS, Lillian and VEALE, Michael, *op. cit.,* p. 67.

[107] EDWARDS, Lillian and VEALE, Michael, *op. cit.,* p. 67.

[108] Data Protection Directive Art. 14.

[109] GDPR Art. 21.

[110] GDPR Art. 6(1)(e).

[111] GDPR Art. 6(1)(f).

6.3 Controllers must cease to process the data unless *compelling* legitimate grounds to continue processing can be demonstrated which override the rights of the individual.[112] Again, it is not entirely clear from the regulation what would meet this standard; however, the use of the word 'compelling' suggests that the threshold for balancing the interests of the controller and the data subject is higher than the balancing exercise required to rely on article 6(1)(f) as a legal basis in the first place. The initial exercise for relying on legitimate interests as a legal basis involves a balancing act to determine whether the controller's legitimate interest would be overridden by the individual's interests or fundamental rights and freedoms.[113] The legitimate interest must be weighed against the rights of the data subject, with reference to considerations such as:

- the reasonable expectations of the data subject at the time and in the context of the data collection, based on the relationship with the controller;
- the level of detail of any profile (the more granular the detail, the more difficult it may be to justify);
- the comprehensiveness of the profile;
- the impact of the profiling on the data subject;
- the safeguards in place to ensure fairness, non-discrimination and accuracy of processing.[114]

6.4 The WP29 opinion on legitimate interests suggests that intrusive profiling, tracking practices, use of click-stream data and predictive algorithms suggest a high level of intrusiveness and would be difficult to justify using legitimate interests as a lawful basis.[115] This was confirmed in a recent case where the French data protection authority (CNIL) served a public notice on a smart meter company providing that it could not rely on the legitimate interest basis for the collection and use of consumption data given the intrusive nature of the informa-

[112] GDPR Art. 21(1).

[113] WP29 Guidelines, *op. cit.,* p. 14.

[114] WP29 Guidelines, *op. cit.,* p. 14.

[115] WP29 Guidelines, *op. cit.,* p. 15.
Article 29 Data Protection Working Party Opinion 06/2014 on the notion of legitimate interests of the data controller under Article 7 of Directive 95/46/EC. European Commission, 9 April 2014. p. 47, 59, 60. (Though the Opinion relates to the previous Data Protection Directive 95/46/EC, the WP29 considers that the guidance remains relevant to the provisions of the GDPR.).

tion it revealed about its customers (times at which they go to bed or wake up, periods of absence, number of people in the household etc.).[116]

6.5 Thus, even if this relatively stringent standard is initially satisfied as a legal basis for processing, this would not be sufficient; there must be legitimate grounds which are compelling to override the individual's objection.[117] The burden of proof to demonstrate compelling legitimate grounds lies with the controller.[118]

6.6 For direct marketing purposes, the individual's right to object is even stronger. The data subject may object at any time to the processing of their personal data for the purposes of direct marketing, regardless of the legal basis for processing, and there is no requirement to provide any grounds for the objection.[119] Following receipt of such a request, the controller must respect the wishes of the data subject without question; there is no need for a balancing act between competing rights.[120]

6.7 Rights to rectification and erasure. The GDPR extends the existing rights regarding rectification and erasure under the Data Protection Directive.[121] This is based upon another key principle that controllers must ensure that all personal data is kept accurate and up to date. Any inaccuracies identified must be erased or rectified without delay.[122] Accuracy is particularly important in the context of big data analytics, given that any decisions or profiles generated from incorrect or outdated data will be defective, which could have a damaging effect on the data subject. It is therefore important that the raw data used for big data ana-

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[116] CNIL - DIRECT ENERGIE : mise en demeure pour une absence de consentement concernant les données issues du compteur communicant LINKY https://www.cnil.fr/fr/direct-energie-mise-en-demeure-pour-une-absence-de-consentement-concernant-les-donnees-issues-du Accessed 23 April 2018.
MOLE, Ariane - GDPR and smart meters: French Data Protection Authority serves a formal notice to a major energy supplier to get ready for GDPR https://web.archive.org/web/20180406215700/https://www.lexology.com/library/detail.aspx?g=b2ea028e-10d8-417c-b48a-ece1c268a948 Accessed 23 April 2018.
(Although based on French data protection law, this finding is significant as it applies the same principles set out in the GDPR.).

[117] WP29 Guidelines, *op. cit.,* p. 19.

[118] WP29 Guidelines, *op. cit.,* p. 19.

[119] GDPR Art. 21(2).

[120] WP29 Guidelines, *op. cit.,* p. 19.

[121] Data Protection Directive Art. 12(b) and (c).

[122] GDPR Art. 5(1)(d).

lytics is accurate to reduce the risk of inaccurate predictions, which could have a significant impact, for example if a player with a gambling addiction who has self-excluded is placed in a category eligible for bonuses. Data subjects have the right to rectify any inaccurate information as well as provide additional information where the information is incomplete.[123]

6.8 Perhaps more significantly, individuals also have the right to erasure (also known as the right to be forgotten) in certain circumstances, including where the information is no longer necessary for the purpose or where they wish to withdraw consent and there are no overriding legitimate grounds for the processing.[124] Controllers are also obliged to take reasonable steps, taking into account available technology, to inform other controllers which are processing the information of the request for erasure.[125] The WP29 guidance advises that these rights under articles 16 and 17 apply widely to all of the data associated with the individual's profile and not just the data that was directly provided and used to create the profile.[126]

6.9 Right to data portability. Article 20 introduces a new right for individuals to receive the personal data they have provided to the controller in a machine-readable format to enable transmission of the data to another controller.[127] Unfortunately, the regulation is not explicit on the meaning of 'provide', which is unfortunate in view of the numerous ways that data can be obtained about an individual as a result of profiling. The WP29 guidance does however suggest that the right applies to all personal data which has been provided directly, or personal data observed about the data subject indirectly; though it does not apply to any profiles or inferences created by the data controller (which is more restrictive than the rights of rectification and erasure).[128] The right also applies only to data which is processed by automated means (though not just *solely* automated), on the basis of consent or where necessary for the performance of a contract, and not therefore to information which is processed in compliance with a legal obligation or in the public interest.[129] Thus, any information which is used for the purposes of detecting fraud or problem gambling would not be subject to this

[123] GDPR Art. 16.

[124] GDPR Art. 16.

[125] GDPR Art. 17(2).

[126] WP29 Guidelines, *op. cit.,* p. 18.

[127] GDPR Art. 20.

[128] GDPR Art. 20; WP29 Guidelines, *op. cit.,* p. 17.

[129] GDPR Art. 20(1), Recital 68.

right. The individual is also entitled, where technically feasible, to have the personal data transferred directly from one controller to another.[130] In theory, this gives the individual more freedom to choose a service provider by being able to easily switch. In reality, however, in the gambling industry players often have multiple accounts open with a number of different operators. It therefore seems unlikely that a player would go through the trouble of porting their data to a different operator when they can easily open a new account, particularly where the data required to be ported under the regulation is relatively restrictive.

6.10 On the face of it, these additional rights demonstrate a positive step in empowering the individual to take control of their data by being able to actively object, amend or delete the personal data which a controller holds about them. In reality, however, the same issue exists in placing the onus on the individual to manage their own privacy, which may not be reasonable or actually desired. Indeed, it is argued that individuals are less concerned with preventing profiling altogether but would actually prefer to have more control over how they are profiled and on the basis of what data.[131] Furthermore, in order to properly utilise these rights, the individual must have access to a proper explanation of how their data is being used and, as demonstrated above, this may not be feasible. Finally, if a player was to exercise their rights under articles 17 and 20 they would ultimately be terminating the relationship with the operator and would be unable to use any of the other services on offer whether or not they relate to the processing in dispute. The remedies might therefore be too extreme for the purpose they seek to achieve.

7. Non-Compliance and Accountability

7.1 While most of the principles outlined in the GDPR build upon existing core values of the existing data protection legislation, it is fair to say that the new regulation introduces number of new rights and obligations which must be complied with. The consequences of non-compliance have also significantly increased in gravity; breach of the regulations can result in a fine of up to 20,000,000 Euros or 4% of the worldwide annual turnover from the previous financial year, whichever is greater.[132] Moreover, any person who has suffered damage as a result of a

[130] GDPR Art. 20(2).

[131] HILDEBRANDT, Mireille - *Smart Technologies and the End(s) of Law. Novel Entanglements of Law and Technology*, 1st edn, Cheltenham, UK, Edward Elgar Publishing, 2015.
EDWARDS, Lillian and VEALE, Michael, *op. cit.,* p. 73.

[132] GDPR Art. 83(5).

breach shall have the right to compensation through court proceedings.[133] Clearly, the risks are reputational as well as financial.

7.2 Accountability is therefore a key theme inherent within the GDPR and organisations need to be responsible for demonstrating compliance with the regulations.[134] One of the key tools provided for by the regulations is the data protection impact assessment (DPIA), which enables controllers to evidence the steps taken in considering and addressing risks of processing personal data.[135] DPIAs are mandatory in relation to 'a systematic and extensive evaluation of personal aspects relating to natural persons which is *based on* automated processing, *including profiling*, and on which decisions are based that produce legal effects concerning the natural person or similarly significantly affect the natural person.'[136] The WP29 guidelines suggest that in using the term 'based on' rather than 'solely', the requirement applies to decision-making that is only partially automated as well as solely automated decisions provided the decision produces a legal or similarly significant effect.[137] It would therefore be sensible to assume that DPIAs are required for all algorithmic systems which may have a legal or similarly significant effect upon an individual to determine which measures should be put in place to protect against the risks as well as to evidence compliance.

7.3 DPIAs have been welcomed as a more appropriate way to combat the threats to individual privacy presented by big data analytics by moving the responsibility away from the individual to enforce their rights. In placing the onus on the organisation to consider privacy when designing and implementing a process, DPIAs foster the principle of accountability; a theme which is arguably lacking in the majority of the regulation.[138] It is just regrettable that DPIAs are only mandatory in relatively restricted circumstances.

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[133] GDPR Art. 82.

[134] GDPR Art. 5(2).

[135] GDPR Art. 35.

[136] GDPR Art. 35(3)(a).

[137] WP29 Guidelines, *op. cit.,* p. 29.

[138] EDWARDS, Lillian and VEALE, Michael, *op. cit.,* p. 77.

8. Conclusion

8.1 This paper sets out the key provisions under the GDPR which apply to big data analytics, including the general prohibition to automated decisions which have a legal or similarly significant impact on the individual. It also outlines the enhanced rights which are granted to individuals in an effort to provide them with more control over their personal data and ultimately protect the fundamental right to privacy.

8.2 It is argued, however, that this liberal approach of putting individuals in charge of managing their privacy may not be the most appropriate for a number of reasons. Firstly, the strongest rights are only available in very restricted circumstances under article 22, where the decision is *solely* automated and there is a *legal* or *similarly significant* effect upon the individual. Certainly, in the context of online gambling there are few realistic examples, given that operators are keen to retain their players in a particularly competitive marketplace. Moreover, it is likely that the most extreme examples which would involve potential discrimination would already be classed as unfair and therefore unlawful.

8.3 Furthermore, the terminology used is often unclear and ambiguous, for example in the requirement for *meaningful* information about the logic involved to be provided. As a result, there is a significant lack of clarity as to the application of the provisions, which makes it difficult for the average individual to understand the rules and avail themselves of the rights granted. The situation is further complicated for UK citizens as a result of Brexit, following which it will be unclear how and to what extent the provisions of the GDPR will be applied. Hopefully, the situation will become clearer following the implementation of the regulation and the arrival of relevant case law.

8.4 This leads to the final criticism that granting a set of enhanced rights to individuals who, in general do not have the time, resource or expertise to enforce them is perhaps not the most appropriate approach. Indeed, individuals are arguably less concerned with obtaining an explanation and would prefer to have more control over how they are profiled, so that the offending decision is not made in the first place. There is a real risk of a "transparency fallacy" arising, where individuals are provided with rights which have no real value. Arguably, in an online gambling context, a player is arguably more likely to use their time to open a new account with a competitor than commence legal proceedings to enforce their rights. More emphasis should be placed on those provisions which require increased accountability from the organisation, such as 'data protection impact assessments', in order to counteract the inherent power imbalance and level the odds between the operator and the individual.

THE DEVELOPMENT OF DIGITAL MARKETS AND THE (LACK OF) CONSUMER PROTECTION: NEED FOR A LEGISLATIVE REFORM?

Isa Meireles[1]

Abstract: If the concept of consumer has always been associated with a necessary and crucial protection of the weakest part in market relations, the truth is that with the evolution and development of a new type of commerce and the disassociation of the market from the traditional on-site element, this concept and its inherent protection are constantly changing.

Keywords: Consumer. Digital markets. Consumer relations.

Summary: § 1. The traditionalist vision of the concept of consumer. 1.1. The concept of consumer in the light of consumer law. 1.2. The legislative intention in the creation of this concept. § 2. The new digital markets and their influence on the consumer. 2.1. The specific case of social networks. 2.2. Accommodation promotion platforms. § 3. The (in)sufficiency of the current legislation towards an effective consumer protection.

§ 1. The traditionalist vision of the concept of consumer.

The concept of consumer and the reality underlying consumer relations have presented, for some years now, an association to the "[biggest] economic group acting in the market, being influenced by (and influencing) all decisions

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made at this level"[2]. The protection of consumers and the association of this consumer relation to an evident development of the market have been of crucial relevance in view of the "[imbalance] that underlies the consumer relation"[3].

Therefore, without a better understanding, it seems crucial to us that the consumer would (probably) be considered the weakest part of the contractual chain. In this respect, several legal theories and case law opinions have been issued, which, after a natural case-by-case assessment, conclude that in consumer relations the premise is that the consumer is, indeed, the weakest part of the contractual chain[4][5].

It is obvious that the initial vision the consumer had regarding the appearance of his protection cannot be the same as the one we face today. Historically, traditional commerce was associated to vendors and consumers meeting up in person, trading and concluding their contracts personally, the contractual subjects having direct contact with each other.

With the technological evolution and the emergence of new types of commerce, it became necessary to also have this development, in terms of consumer protection in the legislation itself.

The truth is that the evolution has been taking place at such a speed that it is often urgent to raise the question: is the consumer really protected in the light of the lawmaker's intentions in assuring that the weakest part of this contractual chain won't be left without protection?

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[2] CARVALHO, Jorge Morais, *Manual de Direito do Consumo*, 3rd edition, Lisbon, Almedina, 2016, p. 13.

[3] CARVALHO, Jorge Morais, *Os contratos de consumo – Reflexão sobre a autonomia privada no Direito do Consumo,* Doctoral thesis in Private Law at the Faculty of Law of the Universidade Nova de Lisboa, Lisbon, March 2011, p. 11.

[4] For instance, on consumer credit, see the Ruling of 09 July 2015 of the Court of Appeal of Lisbon, whose reporting judge was Maria do Rosário Morgado, where it is stated that "[there is] a clear disparity of means in this type of consumer credit agreements, proving that consumers are the weakest part".

[5] In what concerns the question of consumer credits, see also that providing protection to the weakest part – this one being the consumer – comes up with a high preponderance in many of our legal theories. Luís de Lima Pinheiro states that "'contracts concluded by consumers' refer to those having as object the supply of goods or services to a person for a purpose which can be regarded as being outside his trade or profession, as well as the contracts to finance such supplies. This definition corresponds to the one used in article 13 of the Brussels Convention on Jurisdiction and the Enforcement of Judgements in Civil and Commercial Matters and should be interpreted likewise, in the light of the purpose of protection of the weakest party", PINHEIRO, Luís de Lima, "Direito aplicável às operações bancárias internacionais", consulted on the internet through the URL https://www.oa.pt/conteudos/artigos/detalhe_artigo.aspx?idc=30777&idsc=64444&ida=64482, on 20 April 2018.

1.1. The concept of consumer in the light of consumer law:

There are various pieces of legislation providing protection to consumer law. Here we choose to highlight the law on consumer protection (Portuguese Law no. 24/96 of 31 July), the law on distance and off-premises contracts (Portuguese Decree-Law no. 24/2014 of 14 February), the law on boilerplate clauses (Portuguese Decree-Law no. 446/85 of 25 October), the law on sale of consumer goods and associated guarantees (Portuguese Decree-Law no. 67/2003 of 8 April) and the law on consumer credit agreements (Portuguese Decree-Law no. 133/2009 of 2 June).

It should also be mentioned that the paramount protection of consumer rights is provided and assured by the Constitution of the Portuguese Republic, in particular in its article 60, under the heading "Consumer [rights]".

The truth is that the concept of consumer, although it tends to be uniform, has some variations depending on the legislation applied to the consumer relation that is being protected.

In what concerns the law on consumer protection (Portuguese Law no. 24/96 of 31 July), the concept of consumer is presented as a broad concept, always fulfilled by four cumulative scopes. According to article 2 of the same Law, a consumer would be "everyone to whom goods are supplied, services are provided or any rights are conveyed, for non-professional use, by a person performing an economic activity on a professional basis and with the purpose of obtaining benefits".

In turn, in what concerns the distance and off-premises contracts (Portuguese Decree-Law no. 24/2014 of 14 February), the subjective scope of the concept of consumer already presents some variations. Whereas in the law on consumer protection this definition covers every person, whether natural or legal persons, in Decree-Law no. 24/2014 of 14 February, in particular in its article 3(c), the consumer is regarded as "[the] natural person acting for purposes which are outside his trade, business, craft or profession".

Regarding the legislation on boilerplate clauses (Portuguese Decree-Law no. 446/85 of 25 October), we realise that this Decree-Law does not have a definition of consumer. When doubts arise from its application, and provided that the concept of consumer is fulfilled in the light of the law on consumer protection, its application does not cause us confusion.

In what concerns the legislation governing the sale of consumer goods and associated guarantees (Portuguese Decree-Law no. 67/2003 of 8 April), the concept of consumer is enshrined in its article 1-B(a), which foresees that the consumer is "everyone to whom goods are supplied, services are provided or any rights are conveyed, for non-professional use, by a person performing an economic activity on a professional basis and with the purpose of obtaining

benefits". Therefore, the concept of consumer underlying this Decree-Law is once again a broader concept, where there is no difference between the natural or legal character of the consumer, focusing instead on the quality in which the contractual parties act.

Finally, in what concerns consumer credit agreements (Portuguese Decree-Law no. 133/2009 of 2 June), the article 4(1)(a) of this Decree-Law states that the consumer is regarded as "the natural person acting, in the legal transactions covered by this Decree-Law, for purposes other than his trade, business or profession".

Despite the existence of a variation in the concept of consumer, it is true that all the four scopes[6], with more or less differences, end up being protected: (i) the subjective scope; (ii) the objective scope; (iii) the purposive scope, and finally, (iv) the relational scope.

1.2. The legislative intention in the creation of this concept:

It is obvious that the legislative intention reflected in each of the above-mentioned laws is guided by the protection of the weakest part in contractual types that converge in a common point: they are likely to constitute and fulfil the conditions of the concept of consumer contract.

The way these contracts are formed and the special characteristic regarding the buyer/purchaser/beneficiary, commonly known as consumer, means that a more focused logic of protection should be taken into account regarding of who is indeed the weakest part in the contractual chain, although apparently it may rebut this presumption.

§ 2. The new digital markets and their influence on the consumer:

Contracting and contracting methods have evolved: naturally, this should be clear in our study. Markets are no longer the common traditional market and, nowadays, there is an increase in new digital markets and influences which are contributing to a new concept of consumer.

Note that all the concepts we referred to are concepts whose legislative amendment has not affected their wording. The question that arises is associated with the evolution of contracting methods, the creation of new markets and, by

[6] For a deeper understanding of this subject, see CARVALHO, Jorge Morais, *Manual de Direito do Consumo*, 3rd edition, Lisbon, Almedina, 2016, pp. 18-23.

contrast, the absence of any amendment in the concept of the weakest part of those relations.

It should also be noted that digital markets, due to the dangers linked to the internet itself, end up leading to a bigger lack of consumer protection – which, in our opinion, and without a better understanding, can no longer be understood in its traditional form.

We know that one of the means of formation of a distance contract[7] is the contract concluded via the internet, which is naturally linked to electronic commerce[8], on which we want to focus the scope of our study now.

2.1. The specific case of social networks:

Electronic contracting naturally implies opening up new digital markets, where there is the propensity to practice consumer contracts. One of those markets, which is very pertinent in our opinion, is the market created by social networks.

Social networks are often manipulated by influencers that, through their number of followers, can reach a certain number of potential consumers, attracting them to that publicity. And, on the other hand, social networks, through their own algorithms, can understand the consumer's propensity towards contracting.

Besides, there are countless tools and great ease in electronic contracting linked to social markets, more specifically to social networks. In many cases, it is possible to create professional profiles, where there is indeed brand promotion. But, in other cases, it is possible to advertise sales through an individual profile. The main issue concerns this contracting model: individual profiles, whose identity is not controlled at all, advertise online sales whether on their own Facebook pages or in the *Marketplace*. How is protection provided to the consumer?

Since it consists in electronic commerce, we know that we have to apply and interpret Decree-Law no. 7/2004 of 7 January. However, we must not forget that the scope of application of Decree-Law no. 24/2014 of 14 February on

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[7] Which is "[a] contract concluded between the consumer and the supplier of goods or the provider of services, without the simultaneous physical presence of both, under a sales or service-provision scheme organised for distance commerce through the exclusive use of one or more means of distance communication up to and including the moment at which the contract is concluded", as defined in article 3(f) of the Decree-Law no. 24/2014 of 14 February.

[8] For more details, see CARVALHO, Jorge Morais, *Os contratos de consumo – Reflexão sobre a autonomia privada no Direito do Consumo,* Doctoral thesis in Private Law at the Faculty of Law of the Universidade Nova de Lisboa, Lisbon, March 2011, pp. 141.

distance contracts may also be fulfilled in cases involving contracts concluded via the internet.

As mentioned above, the subjective scope of application of the legislation, related to the concept of consumer, must always be observed. At the same time, we must always appreciate the actual concept of distance contract, which is the contract "[concluded] between the consumer and the supplier of goods or the provider of services, without the simultaneous physical presence of both, under a sales or service-provision scheme organised for distance commerce through the exclusive use of one or more means of distance communication up to and including the moment at which the contract is concluded", as provided in article 3(f) of the Decree-Law in question.

Considering that any distance contract is already characterised by the vulnerability and fragility of consumer protection, who is effectively unaware of the underlying reality of the vendor's identity, as well as the real quality and characteristics of the products, it should be stressed that the development of digital markets which do not ensure the real and effective identity of their users, means that the consumer can naturally be at the mercy of these networks.

Alongside this identity problem, which in our opinion is difficult to overcome but can be remedied, the truth is that the application of Decree-Law no. 24/2014 of 14 February falls very far short when it comes to the reality of social networks. First of all, because one of the guarantees aimed at providing protection to the weakest part[9] is the pre-contractual information to be provided by the vendor to the consumer in accordance with article 4 of that Decree-Law.

If the pre-contractual information was established by the lawmaker as a protection mechanism for the consumer regarding traditional commerce, the truth is that nowadays with the emergence of new markets (mainly the digital ones), the importance of this pre-contractual information ends up being relegated to the sidelines[10].

In our opinion, article 4 of the Decree-Law, when appreciated under the analysis of electronic commerce, seems to be very difficult to implement and control, since, as previously stated, there is a lack of knowledge about the real identity of the persons in social network commerce, and, in addition, the fact that the concept of a supplier of goods as anyone engaged professionally in such commerce can be deliberately excluded.

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[9] In other words, the consumer.

[10] On distance contracts, see CARVALHO, Jorge Morais & PINTO FERREIRA, João Pedro, *Contratos celebrados à distância e fora do estabelecimento comercial*, in I Congresso do Direito do Consumo, Lisbon, Almedina, 2016, p. 95.

We will now assess the *Marketplace*[11], whose membership is facilitated by *Facebook* to its users. Due to the inability in effectively knowing the ownership and identity of the users joining the social network, a consumer can never really discover if a user's contractual offer is being issued in the scope of his profession or if it is a non-professional user. Note that this is a very fine line and that, depending on the way the concept of consumer is constructed, the fulfilment of the relational element can be easily excluded.

Considering that this lack of protection is verifiable, in other words, it is possible to exclude the fulfilment of the notion of consumer through the simple manipulation of users' registration on the network, it is true that the evolution of electronic commerce has now placed the consumer in a more vulnerable position.

It is certain that this more vulnerable position is not only justified by the existence of manipulation in users' registration, but also because of the possibility of lack of veracity in their identity. The problem is able to overcome these issues when the algorithm policy is combined with the search for consumer desire, manipulating the suggestions that appear on Facebook and, therefore, contending with the contracting desire.

In view of the issues raised, it becomes clear that the following question has to be raised: what responsibility should be placed on the social network regarding consumer protection? After all, we are talking about a social network that profits from the users registered on it and that is able, by its own means, to influence the consumer's contracting desire (by using his recent searches and following his digital footprint).

In the light of the above, it is worth stating that these distance contracts, more specifically those concluded through social networks, are in fact deprived of an effective consumer protection. If, on the one hand, the ease of contracting in digital markets is a brave new world, the truth is that, on the other hand, there is no protection provided by the social network to the consumer. Moreover, the relational element might not even be fulfilled, regarding the vendor's intervention position, and its guarantees excluded as putative consumer.

[11] *Marketplace* is presented by Facebook as a short cut allowing its users to discover, buy and sell items with their community. Indeed, in its presentation we can read "Discover, buy and sell items with people in your community".

2.2. Accommodation promotion platforms:

We have been discussing the subject of accommodation from the perspective of the lack of consumer protection[12], because the digital platforms that increase the promotion of local accommodation end up being marked by the existence of boilerplate clauses, where the platform itself defines clauses (and clarifies) of its own irresponsibility towards certain situations that may be disadvantageous for the consumer.

As it is easily understandable, the provision of accommodation, regardless of its nature, will always imply a correlation between two obligations: on the one hand, the provision of a service (whether the supply of goods including the provision, or not, of cleaning services, for instance) and, on the other hand, the pecuniary consideration or counterpart in this regard. Considering the existence of these reciprocal obligations, which already constitute an integral part of a complex relation, they present complications when, in turn, they are integrated in electronic commerce.

In the reality of accommodation, apart from social networks, the problems that were raised in their assessment are similar to these ones, except for very specific accommodation issues.

The question that will always be raised is that, today, the promotion and contracting methods – the above-mentioned digital platforms – do not present any proper protection for the consumer who uses them to celebrate the contracts they intend to conclude. It is precisely because of this incongruity, which seriously blurs the lawmaker's will in providing protection to the weakest part of the contractual relationship, that we believe the right way would be: the direct responsibility of the digital markets, or rather the digital platforms, which are not simply the contracting method but are also financially supported by the increase in the number of views and negotiations taking place there. Therefore, as their use leads to benefits, it is worth stating that they will have to contribute more effectively to the protection of consumer rights.

§ 3. The (in)sufficiency of the current legislation towards an effective consumer protection.

By way of conclusion, as the subject we proposed to address is relatively new and there are very few studies regarding it, we believe that the legislation

[12] MEIRELES, Isa, *Alojamento Local e plataformas digitais: dos perigos na desproteção do consumidor*, 5.º Congresso Internacional de Direito na Lusofonia, University of Minho, School of Law, 2018, pp. 167.

currently governing consumer law, as a means of providing consumer protection, does not accommodate the evolution of electronic commerce.

Digital platforms are creating challenges that the current consumer law is not able to protect. First of all, the concept of consumer – subjective scope of the application of different legislations – has four cumulative elements that can easily be excluded simply by using electronic commerce.

Note that the difficulty regarding the authenticity of the users' identity on social networks ends up leading, *per se*, to the lack of consumer protection. Furthermore, if a supplier of goods professionally engaged in the sale of certain consumer goods has the possibility to blur the fulfilment of the relational element by selling personally, anonymously or under another identity, consumer goods (take, for example, the sale of second-hand goods on the internet), we are leaving an open door for the consumer to be at the mercy of the supplier of goods.

On the other hand, the consumer – or putative consumer – that is presented with the need to demand his protection – constitutionally guaranteed –, may not have the means to identify the person who has caused him damages in his legal sphere. Let us remember that profiles can be easily deleted and that requesting access to identity (without guarantees of obtaining a real one) is a very lengthy process. That being said, shouldn't these digital markets or, as one might say, digital platforms bear direct responsibility to the consumer?

We tend to reply in the affirmative, which lead us to a necessary (and urgent) legislative amendment.

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TECHNOLOGY AND HUMAN REPRODUCTION: TRI-GAMETIC *IN VITRO* FERTILISATION

Between the miracle of reproduction and the dangers of dehumanisation

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Abstract: Our paper integrates the matter of reproductive technology, namely the impact and influence of science and technology on assisted reproduction. The process of human reproduction underwent several changes in the last decades: we have seen the separation of sexual intercourse from fertilisation, the use of preimplantation genetic diagnosis, the egg and embryo freezing, the growing number of children born with the help of medically assisted reproduction techniques, among others. It seems that the trend will be for a progressive (and perhaps indiscriminate) use of assisted reproduction techniques, in addition to the use of "new" techniques. Among the "future" techniques, we highlight the artificial womb, cloning, parthenogenesis and tri-gametic *in vitro* fertilisation (TGIVF). We choose to focus our study on TGIVF, because its future is not so remote or utopian: the first birth using this technique occurred in 2016. This technique is essentially associated with mitochondrial diseases and aims to avoid that the future mother transmits to her child the defective mitochondria (the cause of severe problems). There are two procedures used in TGIVF: one performed before fertilisation and another after. We analyse the input of this technique in fostering and enabling the miracle of reproduction, reflect on its risks,

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namely the eventual modification of the human genome and the strong risk of dehumanisation. This analysis, although mainly legal, is performed in two fields: a technical and scientific analysis of the technique and a legal analysis (in which we aim to understand the role of the Law here).

Keywords: technology – reproduction – law

> *"A squat grey building of only thirty-four stories. Over the main entrance the words, CENTRAL LONDON HATCHERY AND CONDITIONING CENTRE (…) "And this," said the Director opening the door, "is the Fertilizing Room." Bent over their instruments, three hundred Fertilizers were plunged, as the Director of Hatcheries and Conditioning entered the room, in the scarcely breathing silence, the absent-minded, soliloquizing hum or whistle, of absorbed concentration."*[2]

1. Technology and human reproduction

1.1. General framework

In the beginning of the 20th century, in England, Aldous Huxley projected in his book "Brave New World" a futurist, industrial and inhuman vision of reproduction[3]. In Huxley's society, traditional family values and personal relationships had no meaning (for example, the terms "mother" and "father" and the idea of a mother-child relationship is mentioned with deep contempt, surprise and disgust). On the contrary, Huxley's society was organised according to scientific principles: the reproduction process was entirely programmed (from reproduction to birth), there was no interference of the human body (there was no pregnancy; the embryo was implanted in an artificial "incubator" and developed in the Hatchery and Conditioning Centre), people were genetically programmed to play a role in society (according to their caste or social group).

[2] Excerpt from the book written in 1931. HUXLEY, Aldous, *Admirável Mundo Novo,* Mário Henrique Leiria (translation), [S.I], Porto, Coleção Mil Folhas 47, 2003, p. 19.

[3] The story takes place in London in 2540.

Almost a century after this publication, we question if Huxley's futurist (and fictional) vision may become true. Our concern arises due to the evolution of science and technology, especially of its impact in the scope of human reproduction. In "Brave New World", among other aspects, Huxley anticipated changes in the process of human reproduction, by describing a "hypothetical" future for reproduction techniques. We know this is a science fiction novel, which is based on a critical message of society at the time. However, science and technology have been showing that many aspects addressed in Huxley's work are no longer a mere utopia.

The evolution of science and technology has led reproductive medicine to approach the essence of humanity, because it is increasingly possible to realise the "natural" wish of reproduction. Therefore, we have seen significant changes in the phenomenon of human reproduction: it is possible to conceive human lives in cases which, until now, were considered absolutely impossible and with no hope. The use of medically assisted reproduction (MAR) techniques[4] allowed couples (infertile and others) to achieve the dream of being parents.

The miracle of life is more and more distant from natural conception. On the one hand, fertilisation (conception) has been separated from sexuality, since it no longer only occurs as a result of sexual intercourse between a man and a woman. The MAR techniques enable human conception in lab, although gestation (v.g. pregnancy) continues to occur in a woman's body. The last years were characterised by the increase in the number of children born with use of MAR. On the other hand, the MAR techniques[5] allow reproduction with the use of donated genetic material (heterologous procreation); the diagnosis of genetic and chromosome changes in embryos, before their implantation, to avoid the birth of children with inherited diseases (preimplantation genetic diagnosis); are used to help surrogacy, among other abilities and possibilities.

From the legal point of view, the Law has been taking part in the regulation of many aspects inherent to assisted reproduction. By its own initiative (acting previously) or because it is called upon to take a position, the Law is not – and cannot be – indifferent to the questions regarding human reproduction, mainly in what concerns sensitive issues (sometimes, ethical and moral) or dangers that may result from an indiscriminate and unfounded use (without a pathological reason or medical cause that supports its use). Now, due to the

[4] In Portugal, the MAR techniques are governed by law no. 32/2006, of 26/07, with amendments introduced by the following laws: law no. 58/2017, of 25/07, law no. 25/2016, of 22/08, law no. 17/2016, of 20/06 and law no. 59/2007, of 04/09. To refer to law no. 32/2006, we will use the expression "MAR law".

[5] In accordance with article 2 of the MAR law, the following techniques are accepted: artificial insemination, *in vitro* fertilisation, intracytoplasmic sperm injection, transfer of embryos, gametes or zygotes and preimplantation genetic diagnosis.

constant evolution of reproductive medicine (v.g. emergence of new techniques), new rules are needed and, possibly, an update to the existing rules, respecting the fundamental principles of the States and not disregarding the evolution of society itself (and its values). Regulation of assisted reproduction is far from being consensual[6]. Although there are common values in the States, regarding the guarantee of human dignity, legislative diversity in this area has been observed. Therefore, it is important to understand to what extent reproductive technology, in an attempt to realise the miracle of reproduction, jeopardises the principle of human dignity and which are its limits. We focus our study on the analysis of a new reproductive technique: the tri-gametic *in vitro* fertilisation[7]. Our paper aims to reflect[8] on the main legal issues arising from this technique, by trying to understand if we run the risk of dehumanisation and how (and in which terms) the Law can take action.

1.2. The future of reproductive technology: the techniques

As mentioned by Vera Raposo "technology allowed the current generation to control the genetic future of coming generations, by deciding which individuals will be born tomorrow"[9]. Well, which individuals are these? Which problems does the Law face with the massive and increasingly specific use of reproductive technology? Will this be the end of natural reproduction? As one can understand, there is a right to reproduction resulting from the right to form a family (art. 36 of the Constitution of the Portuguese Republic), it is also understandable that that right implies limits[10]. Considering that science and technology evolve at a blatant speed, knowing the increasing interest of society for MAR techniques, it seems appropriate to understand what will be the future of human reproduction. In this context, a set of "new" techniques in the

[6] There are many contemporary problems surrounding assisted reproduction, for instance, the destination of surplus embryos (and the ongoing discussion about the judicial nature of the embryo), the use of PGD for opposite or uncontrolled purposes, the dangers of exploiting and selling human life and reproductive tourism.

[7] Hereinafter indicated by the abbreviation TGIVF.

[8] Although briefly.

[9] Our translation. RAPOSO, Vera, *O Direito à Imortalidade: O exercício de direitos reprodutivos mediante técnicas de reprodução assistida e o estatuto jurídico do embrião in vitro*, Coimbra, Almedina, 2014, p. 997.

[10] COUTINHO, Diana, "A constituição de "novas" famílias com recurso à gestação de substituição face ao direito de constituir família", in *Paradigmas do Direito Constitucional Atual*, PORTELA, Irene M. (dir.), MIRANDA GONÇALVES, Rubén; VEIGA, Fábio da Silva (coords.), e-book edition, Barcelos, Instituto Politécnico do Cávado e do Ave, pp. 167-178.

reproduction and gestation processes is broached, namely, the artificial womb, cloning, parthenogenesis and tri-gametic *in vitro* fertilisation.

Parthenogenesis is an asexual reproduction technique[11], in other words, it implies the use of only one gamete, which is similar to cloning (also an asexual technique). However, in parthenogenesis, only the female gamete is used, excluding the male contribution to the creation of an embryo[12]. Therefore, parthenogenesis allows the development of an egg to embryo state, without the need of fertilisation from a male gamete. In fact, parthenogenesis is an effective reproduction process that occurs naturally, for instance, in the reproduction of bees (and other invertebrates), lizards or fish. In human beings, parthenogenesis implies the use of a mechanism that allows the development of an embryo using only female gametes, namely, "physical, chemical or thermal mechanisms, similar to cloning"[13]. Science and technology still don't allow human reproduction through this technique. The future will tell us if that will be possible, however, we have serious doubts about its use. What would be the purpose? The use by female couples? Would it be a technique decoupled from infertility problems, used exclusively to satisfy women's wishes of reproducing without a male contribution? Which would be the effects on the child? Would the child be like a clone? And where would this leave the best interest of the child? Would it be surpassed by the right to maternity? Would this deny the child the right of having a father in the first place[14]?

Reproductive cloning is not exactly a "new" technique, however, it is not used as a technique for human reproduction[15]. In fact, it is forbidden pursuant to articles 7, 9 and 36 of the MAR law[16]. Article 26(3) of the Constitution of the Portuguese Republic, which establishes that "the creation, development and use of technologies and in scientific experimentation" should respect the dignity of

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[11] Opposing to sexual reproduction, in other words, the reproduction that implies the use of two gametes (one female and one male).

[12] RAPOSO, Vera, *O Direito à Imortalidade*, *op. cit.,* p. 401.

[13] Our translation. *Idem, ibidem.*

[14] This occurs with some MAR techniques.

[15] On this topic, refer to, merely as an example, ARCHER, Luís, "Clonagem reprodutiva e não reprodutiva", *in Novos Desafios à Bioética,* Luis Archer, Jorge Biscais, Walter Osswald, Michel Renaud (coord.), Porto, Porto Editora, 2001, pp. 128-131 and BARBAS, Stela, *O Direito do genoma humano,* Doctoral thesis, Coimbra, Almedina, 2007. pp. 439-479.

[16] In the international context, we highlight the following legal instruments, among others: the Universal Declaration on the Human Genome and Human Rights (1997); the Declaration on Human Cloning (1997), of the World Health Organization; the European Parliament resolution on human cloning, of 12 March 1997; the Additional Protocol to the Convention on Human Rights and Biomedicine, of 12 January 1992, which forbids human cloning; the United Nations Declaration on Human Cloning, of 8 March 2005.

the human person (article 1 of the CPR) and genetic identity. So, reproductive cloning is an asexual reproduction method and aims to reproduce genetically identical human beings, but it can also have therapeutic purposes (limited to cell reproduction with a therapeutic objective) and experimentation. This technique may result from the somatic cell nuclear transfer or the embryo splitting (embryo splitting or division)[17] [18].

The artificial womb or ectogenesis[19] will allow a total separation of the reproduction process from the female body, since pregnancy will occur outside the woman's body. This technique will allow (if it becomes possible) the conception and development of the embryo or the foetus in an artificial environment: the artificial womb. The artificial womb takes us back to Aldous Huxley's vision in Brave New World, in particular, it allows us to establish a sort of comparison between the hatchery centres and reproduction through an artificial womb.

2. Tri-Gametic *In Vitro* Fertilisation (TGIVF)

2.1. From the notion to the terminological divergence

The tri-gametic *in vitro* fertilisation is a MAR technique that stems from the "traditional" *in vitro* fertilisation. Generally speaking, in *in vitro* fertilisation, the fertilisation process takes place in a laboratory: in a test tube[20]. The procedure starts with the collection and treatment of male gametes (v.g. sperm) and female gametes (v.g. oocytes). After the collection and treatment of gametes, the fertilisation is done in a test tube, originating the embryo. The embryos are maintained

[17] CARVALHO E SILVA, Willame/ FERREIRA, Valéria Cristina, *Clonagem humana: abordagem sociológica e jurídica*, [Online], VI CONGRESSO PORTUGUÊS DE SOCIOLOGIA, Universidade Nova de Lisboa, School of Social Sciences and Humanities, serial number 600, 2008, p. 4. [Consult. 02.05.2018]. Available at: <URL: http://historico.aps.pt/vicongresso/pdfs/600.pdf>.

[18] The most famous case on reproductive cloning (although in animals) was Dolly sheep, born in 1997, whose birth raised the extensive and heated debate on this topic.

[19] For a further study, see COUTINHO, Diana, "O 'futuro' da tecnologia reprodutiva: o útero artificial", *in Direito na Lusofonia: Direito e novas tecnologias*, Braga, EDUM/JusGov, 2018, pp.53-62 and ATLAN, Henri, *O útero artificial,* Ana M. André (transl.) [S.I], Lisbon, Instituto Piaget, 2007.

[20] SILVA, Paula Martinho da/COSTA, Marta, *A lei da procriação medicamente assistida anotada (e legislação complementar),* 1st edition, PLMJ, Coimbra, Coimbra Editora, 2011, pp.14 and 15.

in an artificial environment "until they reach the blastocyst phase[21]"[22], moment in which they are implanted in a woman's body[23].

The tri-gametic *in vitro* fertilisation consists in the fecundation in laboratory – such as the *in vitro* fertilisation –, but with the particularity of using genetic material of three people: two women and one man. Thus, female gametes (oocytes) of two women and one male gamete (sperm) are used, combining three different DNAs[24] (the child is born with three genetic codes)[25].

The terminology[26] used to define this technique is not homogeneous or consensual, since there are several names, as we will see below. These names are subject to criticism due to the fact that the nomenclature is susceptible of transmitting a wrong or fake idea regarding the technique, not effectively corresponding to its meaning and procedure. Which expressions are those? In addition to tri-gametic *in vitro* fertilisation, we found expressions like mitochondrial donation, mitochondrial therapy, mitochondrial transfer, mitochondrial replacement, mitochondrial modification, three-parent babies, among others[27].

Without entering into a deeper argument on the conceptual divergence – very dependent on scientific explanations – we prefer to adopt the expression TGIVF, because we consider it the most neutral and the one that best reflects the meaning of the technique. In fact, this expression seems to create less confu-

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[21] Embryo with five or six days.

[22] Our translation. SILVA, Paula Martinho da/COSTA, Marta, *A lei da procriação medicamente assistida anotada, op. cit.,* p. 15.

[23] The intracytoplasmic sperm injection also arises from the *in vitro* fertilisation. The difference is that the sperm is inject directly in the oocyte. *Idem, ibidem.*

[24] The DNA (deoxyribonucleic acid) is a molecule composed "of four types of small chemical bases – the nucleotides (represented by the letters A, T, C and G). Four trivial letters that are linked and succeed one another, by a specific order, which is the secret of life, in a total number of about three million", in other words, the genome that exists in each human cell. This is DNA, which contains hereditary characteristics of human anatomy and physiology. (Our translation.) ARCHER, Luís, *"O genoma humano",* in *Novos Desafios à Bioética,* Luis Archer, Jorge Biscais, Walter Osswald, Michel Renaud (coord.), Porto, Porto Editora, 2001, p. 137 and BARBAS, Stela Marcos de Almeida Neves, *O Direito ao genoma humano, op. cit, pp. 91-100.*

[25] With nuclear DNA from the future parents and mitochondrial DNA from a female donor. RAPOSO, Vera, *O Direito à Imortalidade*, *op. cit.,* p. 394. Further ahead, we will see how this procedure takes place.

[26] Cf. HAIMES, Erica/TAYLOR, Ken, "Rendered invisible? The absent presence of egg providers in U.K. debates on the acceptability of research and therapy for mitochondrial disease", in *Monash Bioeth Review,* [Online], 33, 2015; 33, pp. 364–365. [Consult. 14.04.2018]. Available at <URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4801981/>.

[27] Cf. NEWSON, Ainsley/WILKINSON, Stephen/ WRIGLEY, Anthony, "Ethical and legal issues in mitochondrial transfer", in EMBO Molecular Medicine, [Online], 8 (6), 2016, p. 589. [Consult. 14.04.2018]. Available at <URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4888849/>.

sion/misunderstandings about how it works (use of three gametes) and what is effectively replaced. Our position comes from a comparative analysis of different expressions used to refer to the technique, taking into account the degree of reliability and transparency in reflecting its practical and actual implementation. For example, in the United Kingdom (as we will see better below), the expression mitochondrial donation is used. Well, whether it is this name or mitochondrial "replacement" or "transfer", none seem to reflect the most appropriate and correct terminology, because they mirror the idea that there is a donation (transfer or replacement) of mitochondria[28]. However, as a matter of fact, what happens in this technique is precisely the opposite (as we will see in the technical explanation), the purpose of the technique is to remove the nuclear DNA (without the defective mitochondria) from an egg (woman no. 1, v.g. future expectant mother)[29] and transfer it to a female donor[30] (woman no. 2)[31]. Thus, at the same time, the nuclear DNA of the donated egg (woman no. 2) is removed so it can receive the nuclear DNA from woman no. 1[32]. The donor's egg is then fertilised with a male gamete (v.g. future expectant father) and it will be implanted in woman no.1's body. Therefore, the TGIVF goal is not donating or transferring mitochondria, but removing defective mitochondria so fertilisation can occur. There is effectively a donation, because the donor donates her egg without nuclear DNA, containing only her mitochondria. There is, in effect, a transfer or replacement, but of woman no. 1's nuclear DNA and not of mitochondria. It is true that the donor contributes with her mitochondria (they are not removed from the donated egg), however, those expressions tend to be insidious. In alternative,

[28] The mitochondria are small structures present in the cytoplasm of cells that produce energy and also host its own DNA (a different and separated DNA from the main volume of DNA located in the cell nucleus). If the mitochondria are defective, the cell cannot execute its function. The mitochondria exist in every cell of our body. The mitochondria of a future baby are in the cytoplasm of the oocyte, which means, they are inherited from the female gamete. The nucleus of a cell contains 99.8% of our DNA (called nuclear DNA), while the cell mitochondria contain only a small amount of genetic material (between 0.2 and 0.1%). Cf. KINGSLEY NAPLYE, *First cases of mitochondrial donation therapy in the UK and why the "three-parent baby" headlines are misleading*, [Online], 2 February 2018, p. 1. [Consult. 14.04.2018]. Available at <URL: https://www.kingsleynapley.co.uk/insights/blogs/family-law-blog/first-cases-of-mitochondrial-donation-therapy-in-the-uk-and-why-the-three>.

[29] It refers to the woman that suffers of a mitochondrial disease (at least, in theory, because the technique might be used for other purposes).

[30] We adopt the donor expression (the one that gives) because it is the one adopted in the MAR law, without prejudice of considering the donor expression (the one that donates) as appropriate, since it refers to a donation (and not a selling) of eggs.

[31] The host or receiver "egg".

[32] Woman no. 2's nuclear DNA is useless. As we will see ahead, this is only one of the types of TGIVF, the other one implies doing the procedure in embryos. Both have the same objective and there is no mitochondrial transfer.

it would be more correct to use the expression nuclear DNA transfer or replacement. On the other hand, the donation/transfer/replacement expressions seem to suggest that the egg donor only contributes mitochondria, which is not true. The "receiver" or "host" egg contains the donor's mitochondria (woman no. 2), but also all the structure and substance required by the nuclear DNA transferred from woman no. 1 and the genetic material of the man[33]. Therefore, the donated egg is not a simple host or receiver: there are influences, even if minimal, of the donor's DNA.

2.2. The birth of the first baby

Despite the introduction of this technique regarding the future of assisted reproduction, the reality is that this technique is not mere science fiction or in a distant future: in 2016, in Mexico[34], the birth of the first baby (a boy) with TGIVF took place[35]. The event was disclosed in September 2016[36], by the British journal "New Science". From the information published, it is mentioned that the genetic material of three people was used: the (genetic and legal) parents and a female donor. The reason for using TGIVF was to avoid the transmission of a genetic disease. The legal mother (who also contributes with genetic material) has genetic mutations of Leigh syndrome. It is a neurological disease, with no cure, that affects the development of the nervous system, causing the progressive destruction of the central nervous system. Due to the risk of transmission –

[33] Cf. HAIMES, Erica/TAYLOR, Ken, "Rendered invisible? The absent presence of egg providers in U.K. debates on the acceptability of research and therapy for mitochondrial disease", *op. cit.*, p. 364.

[34] A country that does not foresee or regulate the technique.

[35] At the end of the 1990s, in the USA, in order to increase the chances of success of the MAR techniques (fighting infertility cases), researchers combined genetic material of three people but used a technique with some differences (transfer of cytoplasm with healthy mitochondria from a donor to the future mother's oocyte, and then proceeded with the fertilisation of that oocyte). From this technique, 17 children were born, but some had problems, such as developmental disorders, migraines, etc. Such consequences led the Food and Drug Administration (the US agency responsible for the regulation of drugs, food and medical treatments) to suspend the procedure. In 2001, American researchers used the cytoplasm tissue (part of the egg nucleus) from a fertile woman and implanted it in the egg of an infertile woman (thousands of children were born thanks to this technique). However, due to the ethical and legal issues, this technique was also suspended. FERREIRA, Nicolau, "Nasceu bebé com três pais graças a nova técnica", in *Público*, [Online], 2016. [Consult. 11.04.2018]. Available at: <URL: https://www.publico.pt/2016/09/27/ciencia/noticia/nasceu-bebe-com-tres-pais-gracas-a-nova-tecnica-1745364,>.

[36] FERREIRA, Nicolau, "Nasceu bebé com três pais graças a nova técnica", in *Público*, [Online], 2016. [Consult. 11.04.2018]. Available at: <URL: https://www.publico.pt/2016/09/27/ciencia/noticia/nasceu-bebe-com-tres-pais-gracas-a-nova-tecnica-1745364,>.

which had already happened in the past[37] – the couple, from Jordan, decided to use this technique[38] as their last hope for having a biological child. The process of conception took place as follows: in the first phase, the genetic material of the three elements mentioned above was collected; in the second phase, the replacement of the oocyte nucleus, which contained the mutations of Leigh syndrome (legal mother's egg) with the healthy nucleus of the egg donor was made; and the last phase corresponded to the fertilisation through the use of *in vitro* fertilisation, being the embryo implanted in the uterus of the Jordan woman.

In January 2016, in Ukraine[39], a baby with the genes of three people was also born. The mother's egg was fertilised with the husband's sperm and, then, the combination of genes was transferred to the egg nucleus of the donor[40]. However, in this case, there was no mitochondrial disease; the technique was used because the couple was infertile (after 15 years of trying to get pregnant, including the use of *in vitro* fertilisation): the medical team considered that this technique would result in this couple as an alternative to traditional techniques. So, the use of the technique for other purposes opens a door to a diverse (and indiscriminate) use, which makes us further question, when and who may use this technique.

2.3. TGIVF in the United Kingdom

The only country that accepts the use of TGIVF is the United Kingdom, as of 2015[41], although no birth has occurred using this technique. The approval of the technique, named mitochondrial donation[42], introduced changes to the

[37] Before this birth, the couple had two babies that died with Leigh syndrome (in addition to several miscarriages).

[38] It seems that the purpose underlying the technique – non-transmission of the disease – was achieved. The medical exams performed on the baby, in 2016, showed that only 1% of his mitochondria had that genetic mutation. FERREIRA, Nicolau, "Nasceu bebé com três pais graças a nova técnica", *op. cit.*

[39] Ukraine regulates MAR broadly and with rare restrictions, facing it as an expensive business (consider the example of surrogacy, which is permitted against payment). [Consult. 12.05.2018]. Available at: <URL: http://sicnoticias.sapo.pt/mundo/2017-01-18-Bebe-nasce-na-Ucrania-com-ADN-de-tres-pais

[40] The pronuclear transfer technique was used, which we will address later.

[41] Approved by The Human Fertilisation and Embryology (Mitochondrial Donation) Regulations 2015, no. 572: Human Fertilisation and Embryology Act (Mitochondrial Donation), 2015, no. 572. Available at: <URL: https://www.legislation.gov.uk/ukdsi/2015/9780111125816/contents>.

[42] Original expression: mitochondrial donation.

Human Fertilisation and Embryology Act 1990[43] and aims to avoid the transmission of serious (mitochondrial) genetic diseases[44]. The technique allows the defective mitochondrial DNA contained in the mother's egg (legal and also genetic) to be replaced by healthy DNA from a female donor and aims to avoid that harmful mutations are inherited[45]. The mitochondrial diseases assume several forms; some of them are caused by mutations in DNA contained in each mitochondrion[46].

Three years after the approval of this technique, the Human Fertilisation and Embryology Authority (HFEA) permitted the birth of the first children[47]. The future mothers are two women diagnosed with MERRF (Myoclonic Epilepsy with Ragged Red Fibers) syndrome, in other words, a multisystem mitochondrial disease that changes the energy metabolism of the cells. If it reaches the central nervous system[48] it may cause spasms, weakness and progressive tightness of muscle fibres, difficulty in coordinating movement, seizures and heart diseases.

In the United Kingdom, the technique is not totally consistent with the procedure followed in the birth of the first baby with three DNAs. Firstly, the technique applies when there is a risk of transmitting mitochondrial disease to

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[43] Article 35A. of the Human Fertilisation and Embryology Act 1990, amended in 2008.

[44] HUMAN FERTILISATION AND EMBRYOLOGY, *Mitochondrial donation treatment*. Available at: <URL:https://www.hfea.gov.uk/treatments/embryo-testing-and-treatments-for-disease/mitochondrial-donation-treatment/>.

[45] Both genders can inherit the disease, but only women are at risk of transmitting the disease to their children. Therefore, the mitochondrial DNA is inherited from the female element while the nuclear DNA is the result of the combination of female and male gametes. Cf. SALMAN, Sarah, *Ethical and Legal Thought on Mitochondrial Donation*, [Online], Research Center for Islamic Legislation and Ethics, 2015. [Consult. 14.04.2018]. Available at <URL: https://www.cilecenter.org/en/articles-essays/ethical-and-legal-thought-on-mitochondrial-donation/>.

[46] HAIMES, Erica/TAYLOR, Ken, "Rendered invisible? The absent presence of egg providers in U.K. debates on the acceptability of research and therapy for mitochondrial disease", *op. cit.,* p.360.

[47] For a clinic to use this technique, it needs to get the respective licence.

[48] SHERRAT, Sam, "Women selected for mitochondrial donation in Uk", in *BioNews,* [Online], 936, 2018. [Consult. 14.04.2018]. Available at: < https://www.bionews.org.uk/page_96351>

both the oocyte[49] and the embryo[50]. In other words, there are two procedures used in mitochondrial donation: one performed before *in vitro* fertilisation (targets the egg) and the other after *in vitro* fertilisation (targets the embryo). In the first case, it is designated as Maternal Spindle Transfer (MST) and in the second case, Pronuclear Transfer (PNT)[51]. In both cases, the eggs and embryos are created using the nuclear genetic material of the recipients and the healthy mitochondria contained in the egg donated by a third element. In both, the eggs and the embryos cannot be used for any other purpose other than the intended for this technique.

The maternal spindle transfer procedure[52] is divided into three steps (cf. point 4 of Regulations 2015). In the first step, the entire nuclear DNA (which contains the nuclear chromosomes) is removed from the egg designated as egg A (it is the healthy egg, the donor's egg) and the egg designated as egg B (it is the unhealthy egg, the one that contains defective mitochondria)[53]. In other words, the goal is the removal of the egg's nuclear DNA, which contains the affected mitochondria and its insertion in the donated egg[54]. In the second step, the entire nuclear DNA of egg B[55] is transferred to egg A[56], creating egg P, which does

[49] We transcribe here point 5 of The Human Fertilisation and Embryology (Mitochondrial Donation) Regulations 2015: "Permitted egg: circumstances 5. The circumstances referred to in regulation 3(b) are that—(a) the Authority has issued a determination that—(i) there is a particular risk that any egg extracted from the ovaries of a woman named in the determination may have mitochondrial abnormalities caused by mitochondrial DNA; and (ii) there is a significant risk that a person with those abnormalities will have or develop serious mitochondrial disease; and (b) egg B was extracted from the ovaries of the woman so named."

[50] We transcribe here point 8 of The Human Fertilisation and Embryology (Mitochondrial Donation) Regulations 2015: "Permitted embryo: circumstances 8. The circumstances referred to in regulation 6(b) are that—(a) the Authority has issued a determination that—(i) there is a particular risk that any embryo which is created by the fertilisation of an egg extracted from the ovaries of a woman named in the determination may have mitochondrial abnormalities caused by mitochondrial DNA; and (ii) there is a significant risk that a person with those abnormalities will have or develop serious mitochondrial disease; and (b) embryo B was created by the fertilisation of an egg extracted from the ovaries of the woman so named."

[51] These are the two types of treatment of mitochondrial disease, in other words, two forms of use of this technique.

[52] Cf. NEWSON, Ainsley/WILKINSON, Stephen/ WRIGLEY, Anthony, "Ethical and legal issues in mitochondrial transfer*", op. cit.,* pp. 589–591.

[53] Cf. point 4 of Regulations 2015.

[54] NEWSON, Ainsley/WILKINSON, Stephen/ WRIGLEY, Anthony, "Ethical and legal issues in mitochondrial transfer", *op. cit.,* p. 589.

[55] In other words, the essential nucleus of the cells without defective mitochondria DNA is transferred.

[56] "3) In step 2 all the nuclear DNA of egg B which is not polar body nuclear DNA is inserted into egg A."

not suffer any change in the nuclear or mitochondrial DNA (since it is created through this process – cf. point 3(c) of Regulations 2015)[57]. In the third step, the egg is fertilised using *in vitro* fertilisation, which means, egg P is fertilised with the sperm, creating an embryo.

The pronuclear transfer procedure is divided into four steps. In a first moment, the *in vitro* fertilisation is used to fertilise the recipient's egg(s) (legal and genetic mother) with the sperm (v.g. father) and fertilise the donor's egg(s) with the father's sperm, originating two groups of embryos. In a second moment, the nuclear genetic material (the nuclear DNA) is removed from the two embryos: embryo A (healthy, resulting from the fertilisation of two gametes from the donor and the father) and embryo B (with unhealthy mitochondria, resulting from the fertilisation of the gametes from the recipients). In a third moment, the nuclear DNA of embryo B is inserted into embryo A, in other words, the nuclear genetic material of embryo B is transferred to embryo A (which contains the healthy mitochondria and whose nucleus was already removed). Finally, the embryo is implanted in the recipient's uterus (cf. point 7 of Regulations 2015).

In the United States of America (USA), this technique is forbidden. The American Congress forbids the use of techniques susceptible of changing genes, including TGIVF[58]. In 2016, the National Academies of Sciences, Engineering and Medicine (NASEM) recommended that the use of this technique should only be performed in certain circumstances and the implantation of male embryos is the only procedure considered possible[59].

2.4. TGIVF versus preimplantation genetic diagnosis (PGD)

When we began studying TGIVF, the first question on which we focused was trying to understand if this technique would be included in PGD, since both are methods for treating genetic diseases. In order to answer our doubt, next we will refer the common aspects of these techniques and what distinguishes them.

The PGD is a MAR technique, accepted in the Portuguese legal order (cf. articles 2(1)(d), 28 and 29 of the MAR law). This technique, performed

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[57] Egg P is not materially a third egg, but only the result of the transfer of genetic material from egg B to egg A. It is the result of the union of the donated egg with the nuclear DNA of the recipient's egg.

[58] Cf. LOIKE, John D./ REAME, Nancy, "Opinion: Ethical Considerations of "Three-Parent" Babies", in The *Scientist Magazine*, [Online], December 2016, p.1. Available at <URL: https://www.the-scientist.com/?articles.view/articleNo/47725/title/Opinion--Ethical-Considerations-of--Three-Parent--Babies/>.

[59] NEWSON, Ainsley/WILKINSON, Stephen/ WRIGLEY, Anthony, "Ethical and legal issues in mitochondrial transfer", *op. cit.,* p. 589.

before the implantation of the embryos, aims to detect serious abnormalities (avoid the transmission of serious genetic diseases or major chromosome abnormalities), according to article 28 of the MAR law. Therefore, the embryos that are not in "conditions for developing successfully" will not be implanted[60]. Pursuant to article 29 of the MAR law "PGD is intended for people from families with changes that cause early death or serious disease, when there is a high risk of transmission to their descendants"[61].

TGIVF also aims to prevent (eradicate) the transmission of mitochondrial diseases. However, avoiding the transmission of such diseases is not reason enough to use PGD, in other words, the "normal" use of a MAR technique to later verify if the embryo suffers from any abnormality. PGD is not used to find a healthy embryo, it is used to identify and prevent the implantation of embryos identified with abnormalities. Therefore, only with the TGIVF procedure – explained above – is it possible to avoid the transmission of mitochondrial diseases, since the defective mitochondria are not transmitted to the donated and implanted egg.

In this sense, and answering our question, TGIVF is not a synonym of PGD. Both raise reluctance and contradictory positions: from defending the use of these techniques to defending their eradication, since these attract a high risk of eugenics[62] (a projected choice of babies), questions related to the selection of embryos, the destination of surplus embryos, among many others, which we will analyse ahead.

2.5. Where does the law stand?

a). General notes

The deeper study of this matter, from technical and scientific questions to problems regarding the technique, is beyond the scope of our paper[63]. However,

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[60] Our translation. SILVA, Paula Martinho da/COSTA, Marta, *A lei da procriação medicamente assistida anotada, op. cit.,* p.15.

[61] Our translation.

[62] Eugenics consists on the "genetic modification of an embryo in view of obtaining certain desirable characteristics" (our translation). MEDEIROS, Rui/CORTÊS, António, "Comentário ao art. 26.º da CRP", in *Constituição da República Portuguesa Anotada*, Jorge Miranda/Rui Medeiros (org.), Vol. I, 2nd edition, Coimbra, Coimbra Editora, 2011, p. 631.

[63] We recognise we had the need to present a more technical and scientific framework, in order to understand the technique and to understand the legal issues that may result from its application.

we briefly intend to list some of the eventual legal issues surrounding the technique, without denying its ethical and moral ones.

By focusing on the law, this technique raises an array of questions: the legitimacy to access the technique, concerns relating to an eventual genetic modification of human beings, the donor's anonymity versus the right to know the genetic origins, the destruction of surplus and useless embryos, the instrumental nature of the egg's donor (will this be faced as a mean to an end?), the risk of eugenics, among many others[64].

In the Portuguese legal order, the technique is not accepted, as we mentioned above, only the MAR techniques foreseen (and in the terms) in article 2 of the MAR law are allowed. Nevertheless, the absence of legal regulation is not synonymous of denying the technique or considering it as in conflict with fundamental values and principles of our legal order. It seems to us that the "absence" results from TGIVF's own state of evolution. On the one hand, the scientific research is relatively recent (a few years), and is starting to present results of effective usability, but unknowing the impacts and effects that it might have on the child after birth (if it effectively eliminates the mitochondrial disease; the influence of the donor's DNA, etc.). On the other hand, we cannot disregard that only one country has regulated this matter, the United Kingdom, where no birth has taken place so far. So, the eugenic concerns (of genetic modification) inherent to the nature of the technique raise many constraints and doubts regarding its application.

b). The principle of dignity of the human person

Comparatively to the current legislative framework on assisted reproduction, it is essential to emphasise the need that TGIVF[65] respect the principle of dignity of the human person established in article 1 of the CPR, article 1 of the MAR law and in several international legal instruments. The rule of dignity of the human person is the basis of the entire law and assumes a special importance in human reproduction, especially in assisted reproduction. The main problems relate to the dangers of using technology for genetic changes, to create projected babies based on medically unjustifiable choices (such as, choosing race or eye colour), promoting the risk of eugenics and attacking human dignity. Alongside are the concerns regarding the exploitation of the human being, the treatment of a person as a means to a certain end, the risk of marketing related to MAR

[64] NEWSON, Ainsley/WILKINSON, Stephen/ WRIGLEY, Anthony, "Ethical and legal issues in mitochondrial transfer", *op. cit.,* p. 589.

[65] Such as any MAR technique.

techniques, the lack of protection of the best interest of the child born from the technique. Well, all these fears also apply to the application of TGIVF. Will this technique effectively guarantee the respect of human dignity? Isn't Man trying to replace human nature?

We highlight once again article 26(3) of the CPR, since it establishes that reproductive techniques should respect human dignity and genetic identity. To ensure respect for genetic identity, it is necessary that the MAR techniques do not promote eugenics. Article 13 of the Oviedo Convention[66] establishes that "an intervention seeking to modify the human genome may only be undertaken for preventive, diagnostic or therapeutic purposes and only if its aim is not to introduce any modification in the genome of any descendants". Article 8 of the Portuguese law of personal genetic information and health information (law no. 12/2005, of 26 January) establishes that "the medical intervention seeking to intentionally modify the human genome may only be undertaken after verifying the conditions established in this law, for preventive and therapeutic purposes"[67]. This law forbids, in article 8(2), "any medical intervention seeking genetic manipulation of characteristics considered normal, as well as changing the germline of a person"[68]. Article 16(1) of the same law mentions that "research on the human genome follows general rules of scientific research in the field of health, being obliged to reinforce confidentiality regarding the identity and characteristics of studied individuals". Finally, it is important to mention that article 11(2) of the same law forbids the discrimination against genetic characteristics. Thus, it is important to understand if TGIVF constitutes a genetic change.

c). Genetic modification and donor exploitation

The birth of the first baby through TGIVF fostered a deeper debate on the technique and brought to the media the expression "three-parent babies". In this sense, one of the main controversies of this technique has been understanding if the technique reflects genetic change or if the child has, in fact, three parents. As we have seen above, the nuclear DNA belongs to the future expectant parents (to the father and the mother); however, the mitochondrial DNA belongs to the egg's donor: so, in fact, there are genetic elements (DNA) from three distinctive subjects. For researchers, the answer to our concern is in the proportion of DNA, which means, the genetic contribution of each subject. According to the scientific explanation, around 99.9% of human DNA is in the nuclear DNA chromo-

[66] Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine.

[67] Paragraph 1 of the mentioned article (our translation).

[68] Associated to the right to privacy of genetic information (our translation).

somes (almost 23 000 genes)[69]. On the contrary, the mitochondrial DNA only represents 0.1% of human DNA[70]. So, the genetic contribution from the child's parents will be extremely higher than the contribution from the mitochondria donor and the receiver egg: about 99% against 0.1 or 0.2%.

It is the nuclear DNA that defines physical characteristics (hair colour, eye colour, etc.) and personality; the mitochondrial DNA does not contribute to this definition[71]. Mitochondria only provide the energy necessary for the cells to work properly. Therefore, science seems to transmit the message that the child born through this technique is not a child of three parents, due to the minimal contribution of the female donor's DNA. Such contribution is not sufficient for the child to carry the donor's characteristics, nor for the donor to assume any rights and obligations. For instance, in the United Kingdom, legislation establishes that the donor is considered a donor, never a parent, not having any rights or obligations related to maternity. According to the English law, the legal mother is the gestational mother (the one who gives birth to the child), in this case, it will be the woman using the TGIVF technique[72].

On the contrary, as mentioned above, science sustains that the female donor not only contributes with mitochondrial DNA, but she also offers the initial environment, favourable for the development of the embryo (the egg that will be fertilised is the donor's egg, although without its nuclear DNA)[73]. The donor cannot be seen as an object nor be exploited: without her, this technique would not be possible. It is the donor's contribution that will allow the child to be born without the mother's defective mitochondrial DNA. By "devaluating" the contribution of the donor's DNA, TGIVF seems to treat it as a means to an end. The English law compares the mitochondrial donation to organ donation (tissues, etc.)[74] and blood transfusion. The reasons for this treatment are very different and may aim to "hide" or minimise the actual contribution of the female donor (even if minimal) to the child's physical or psychological characteristics[75]. So, if we understand that genetic contribution is essential for the definition of the

[69] Cf. HAIMES, Erica/TAYLOR, Ken, "Rendered invisible? The absent presence of egg providers in U.K. debates on the acceptability of research and therapy for mitochondrial disease", *op. cit.,* p. 373.

[70] *Idem, ibidem*.

[71] *Idem, ibidem.*

[72] Human Fertilisation and Embryology Act (HFEA) 2008, 33.

[73] *Idem, ibidem*.

[74] Human Fertilisation and Embryology Act (HFEA), 2013, 6.64.

[75] Cf. HAIMES, Erica/TAYLOR, Ken, "Rendered invisible? The absent presence of egg providers in U.K. debates on the acceptability of research and therapy for mitochondrial disease", *op. cit.,* p. 373.

child's characteristics, we can compare this technique to egg or sperm donation with the inherent legal consequences.

In another perspective, there are people[76] who considers this technique unnecessary, because it does not cure the disease (unnecessary) and the recipients may use egg donation. Against this technique, there is the argument that not even all carriers of mitochondrial diseases develop the disease, so the use of a technique in which there is no absolute "risk" of developing the disease is not acceptable. We do not consider these sustainable arguments to rule out the application of the technique, because accepting these arguments would also be denying the use of PGD. In other words, the use of PGD does not eliminate the carrier's disease, but it allows that the disease is not transmitted to descendants. The same happens with TGIVF: it does not eliminate or cure the mother's disease, but it allows the child to be born with no defective mitochondria. In addition, with egg donation, reproduction is heterologous (even with the male element having contributed with his gametes), not completely achieving the wish of a biological child. In turn, TGIVF, despite the contribution of the donor's mitochondrial DNA, is closer to achieving a biological child (the genetics of the future parents prevails).

Does TGIVF effectively cause a modification of the human genome[77]? This is the aspect which is at the heart of the question, doubts, fears, reservations and denial of this technique. Is there violation of the human genome? Is there genetic modification of the child? Science has divided this topic according to the child gender that is born: female or male. Let us see, any child (boy or girl) inherits the donor's mitochondria, but only the girls may transmit those mitochondria to their children in the future, because mitochondria are transmitted by the female element[78]. Therefore, for example, the USA argues that the use of TGIVF can only be accepted for the birth of male children. The idea is that the girls born from the technique, by transmitting the donor's mitochondria, are contributing to the genome modification (described as germline modification)[79]. The NASEM report distinguishes genetic modification from germline modification (NASEM, 2016, section 3)[80]. Therefore, genetic modification is considered the alteration/

[76] *Idem, ibidem.*

[77] For a deeper legal study on the human genome, refer to BARBA, Stela Marcos de Almeida Neves*, Direito do genoma humano*, op. cit.

[78] Cf. SALMAN, Sarah*, Ethical and Legal Thought on Mitochondrial Donation*, *op. cit*., p. 7

[79] Cf. HAIMES, Erica/TAYLOR, Ken, "Rendered invisible? The absent presence of egg providers in U.K. debates on the acceptability of research and therapy for mitochondrial disease", *op. cit.,* p.371.

[80] NEWSON, Ainsley/WILKINSON, Stephen/ WRIGLEY, Anthony, "Ethical and legal issues in mitochondrial transfer", *op. cit.,* p. 589.

change in the genetic material of a cell, while germline modification[81] is considered the inherited genetic alteration/modification[82]. So, it considers that TGIVF causes a germline modification when a girl is born[83]. On the contrary, the United Kingdom Department of Health considers that the technique only involves a germline modification[84] "in that the result of mitochondrial donation – the avoidance of the transmission of a serious mitochondrial disease – will be passed down to future generations"[85]. They compare the mitochondrial donation to the donation of organs and blood, because people who receive an organ transplant or blood transfusions are not considered genetically modified[86]. However, the position of the United Kingdom has been criticised, in particular, they are accused of "hiding" or denying what effectively occurs when using this technique: the genetic modification. Luís Archer gives as an example of germline germ therapy[87] as a "type" of TGIVF and considers that it represents a form of germline genetic manipulation[88]. The intervention in the germline causes "a modification in all

[81] It seems that TGIVF can be integrated in gene therapy, since it presents some similarities. The gene therapy is defined "as the deliberate transfer of genetic material to a patient's cells, aiming to cure or prevent an inherited or acquired disease". The gene therapy may be germline or somatic, based on the type of cells which are object of that transfer: germline cells ("they are sperm or oocytes and its precursor cells, as well as the early stages of human embryos, before the differentiation of germline") or somatic (all the other cells). (Our translation.) ARCHER, Luís, "Terapia génica somática", *in Novos Desafios à Bioética,* Luis Archer, Jorge Biscais, Walter Osswald, Michel Renaud (coord.), Porto, Porto Editora, 2001, p. 164. Furthermore, the germline gene therapy allows "avoiding the transmission of inherited genetic diseases (monogenic or multifactorial)"; ensuring the cure of the individual and of all his descendants (in contrast to the somatic gene therapy, which only cures the disease of one person). (Our translation.) Cf. BARBAS, Stela, *O Direito ao genoma humano, op. cit.,* p. 96.

[82] NEWSON, Ainsley/WILKINSON, Stephen/ WRIGLEY, Anthony, "Ethical and legal issues in mitochondrial transfer", *op. cit.,* p. 591.

[83] *Idem, ibidem.*

[84] Cf. DIMOND, Rebecca, "Social and ethical issues in mitochondrial donation", in *British Medical Bulletin*, [Online], vol. 115, 2015, p. 178. [Consult. 02.05.2018]. Available at: <URL: https://www.ncbi.nlm.nih.gov/pubmed/26351372>.

[85] *Idem, ibidem.*

[86] *Idem, ibidem.*

[87] The germline gene therapy is distinguished from genetic improvement engineering. The second aims to improve the (non-pathological) characteristics of healthy people (living people or that are not yet born, we add), through the improvement of certain characteristics. ARCHER, Luís, "Terapia génica germinativa – erradicar doenças hereditárias", in *Novos Desafios à Bioética,* Luis Archer, Jorge Biscais, Walter Osswald, Michel Renaud (coord.), Porto, Porto Editora, 2001, p. 168.

[88] It refers to the use of the technique also in cases with mitochondrial diseases. In this case, "blastocyst produced *in vitro* by the gametes of a couple" is extracted from the stem cell nucleus and is transferred to the oocytes without nucleus from the female donor. (Our translation.) ARCHER, Luís, "Terapia génica germinativa – erradicar doenças hereditárias", *op. cit.,* p. 168.

the individual's cells (….) changes the human identity or the genetic inheritance of humanity and has possible eugenic consequences, constituting a violation of human dignity"[89]. For the author, the dangers and negative effects related to this manipulation are still unknown[90], therefore, the prohibition of the transfer of modified embryos to the human body (subject to experimentation)[91] is justified.

Luís Archer relates the principles of bioethics (autonomy, beneficence and non-maleficence, justice) with the germline gene therapy[92]. Regarding the principle of autonomy of choice (related to the dignity of the human person), he refers that the use of technology to avoid the transmission of serious diseases assumes the presumed consent of the descendants (those who were born thanks to the technique), which does not happen (and does not count) in the case of genetic improvement engineering[93]. So, can one expand the presumed consent to the case of generations born through TGIVF? We have serious doubts that the presumed consent can legitimate genetic manipulation, especially in TGIVF[94]. On the one hand, the consent required for the practice of any medical act should, as a rule, be expressed or tacit, being only presumed in cases of emergency situations (exceptional situations) in which consent cannot be obtained[95]. Here, consent is given by the parents of the child, who does not exist at the time of the manipulation, as a holder of rights and obligations. The parents give consent[96] to the manipulation of genetic material that belongs to them, but whose goal is to give birth to a new life. It is possible that the child (future adult) agrees with the intervention performed, but would this legitimate the use of the technique? Will this "presumed consent" be justified only by health reasons or also by other grounds? It is here that the concern regarding this type of techniques exists: the line between the attempt of preventing diseases or avoiding the transmission of

[89] Our translation. *Idem*, p.170.

[90] They were in 2001 (time when the article was written) and still are to the present date.

[91] ARCHER, Luís, Terapia génica germinativa – erradicar doenças hereditárias", *op. cit.,* p. 168.

[92] *Idem,* pp. 169 and 170.

[93] *Idem*, p. 169.

[94] On the informed consent for the knowledge and intervention in human genome cf. BARBAS, Stela, *O direito ao genoma humano, op. cit.,* pp. 325-388.

[95] Article 16(4) of the Portuguese law no. 12/2005, of 26 January, establishes the demand in obtaining informed consent for research on human genome, "the research on the human genome in people cannot be performed without the informed consent of those people, expressed in written, after the explanation of their rights, research nature and purposes, the procedures used and the potential risks involved for them and third parties" (our translation). Consent is also required in the use of MAR techniques (article 14 of the MAR law).

[96] Informed consent must respect the needs of capacity, information and voluntariness. Cf. COUTINHO, Diana, *O Consentimento Informado na Responsabilidade Civil Médica*, Master's Thesis at the School of Law of the University of Minho, 2014, pp. 66-110.

serious and disabling health problems is very close to the line of using this technique for non-pathological purposes[97].

In what concerns the principle of beneficence and non-maleficence, the germline therapy is presented as a long-term beneficiary, because it enables saving "an unlimited number of expensive and costly therapies in somatic cells"[98], reduces the number of inherited diseases and may appear as a medical imperative (the duty of a doctor to treat a patient), if it is proven that the risks are not harmful[99].

Regarding the principle of justice, one of the main critiques appointed to this technique (and fear) is that it becomes human improvement engineering[100] with the inherent eugenics issues. Also, in the case of improvement engineering – if it becomes possible – what would be the access criteria? Only those with financial means could have access? Or would the technology be used to help those most in need (people with dementia, cognitive problems, etc.)[101]? In Portugal, as mentioned above, gene therapy (cf. article 8(2) of the law no. 12/2005, of 26 January), whose objective is the genetic manipulation of characteristics considered normal, as well as changes in a person's germline, is forbidden.

d). TGIVF recipients

Another relevant legal question is the legitimacy of access to TGIVF. Who can use the technique? In the United Kingdom, only women with mitochondrial disease can. In addition, the United Kingdom restricts the access to heterosexual couples, since in TGIVF, sperm donation is not accepted. Therefore, the access to single women or female couples that suffer from mitochondrial disease is blocked.

If the technique is approved in other countries, will the access be limited to mitochondrial disease? The regulation of MAR techniques differs, from order to order, between "the freedom of use of techniques and rigorous and subsidiary criteria"[102]. So, we fear that the same may happen in the use of TGIVF, namely,

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[97] ARCHER, Luis, "Programar o homem do futuro", *in Novos Desafios à Bioética,* Luis Archer, Jorge Biscais, Walter Osswald, Michel Renaud (coord.), Porto, Porto Editora, 2001, p. 192.

[98] Our translation. *Idem, ibidem.*

[99] ARCHER, Luis, "Terapia génica germinativa – erradicar doenças hereditárias", *op. cit.,* p. 170. In the same sense, BARBAS, Stela, *O Direito ao genoma humano*, *op. cit.,* pp. 96-101.

[100] *Idem, ibidem.*

[101] ARCHER, Luis, "Programar o homem do futuro", *op. cit.,* p. 192.

[102] Our translation. Cf. COUTINHO, Diana, "O futuro da tecnologia reprodutiva: o útero artificial", *op. cit.,* p. 59.

a use for purposes different from the one for avoiding the transmission of the disease. For example, will a female couple be able to use the technique so a child can be born with the genetic contribution of both women (being one the mitochondria donor)? Or a female couple in which one of them has the disease? Will it be used to improve fertility, emerging as a helpful technique for infertility problems?[103] Also, consider the hypothesis presented by Vera Raposo[104]: the use of the technique with genetic material of two women with no health problems. This technique would be very appealing to those couples, but may it constitute an alternative to sperm donation? We doubt that something like this can happen in Portugal, due to the subsidiary nature of these techniques (cf. article 3 of the MAR law), even in the case of female couples[105]. A well-founded reason is necessary to use these techniques so, excluding male DNA (if possible) does not seem a valid reason to us. On the one hand, the impacts that such a fact would have on a child to be born are unknown. In addition, if the mitochondrial DNA only represents about 0.1% of genetics, not contributing to physical and emotional characteristics, the use of this technique on a child who will be born with the genetic material of "two women" does not seem justifiable. On the other hand, there is the use of the techniques to purely satisfy the interests of the couple, without a justifiable medical cause[106], attacking fundamental values and principles of our society, particularly, the right to form a family. Article 36 of the CPR establishes the right to form a family, which includes the possibility of forming a family through MAR techniques (cf. article 67 of the CPR). However, that right has limits, namely, the restrictions of article 18 of the CPR "such restrictions must be limited to those needed to safeguard other constitutionally protected rights and interests" (2) and "must have a general and abstract nature and may not have a retroactive effect or reduce the extent or scope of the essential content of the constitutional precepts" (3). Therefore, pursuant to article 18 of the CPR, the prohibition of TGIVF – as a restriction to the reproductive right – attacks the principle of proportionality if it is considered inappropriate, unnecessary and disproportional (in a narrow sense). In other words, it is essential to know if

[103] Cf. DIMOND, Rebecca, "Social and ethical issues in mitochondrial donation", *op. cit.,* p. 175. Such as what happened in the case of the baby born in Ukraine.

[104] Cf. RAPOSO, Vera, *O direito à imortalidade, op. cit.,* p. 395.

[105] In 2016, the access to MAR techniques was extended to female couples and single women.

[106] On the balancing of interests, it may be argued if it is discrimination to remove a female couple when one of them suffers from the disease. So, these women also have a viable alternative: the use of the healthy woman's eggs, with no need to resort to this technique. A specific demand for using the eggs of the woman who suffers from mitochondrial disease, when there is an alternative, may lead to the arguments mentioned in this article. Consider the access of female couples to MAR: one contributes with the egg and the other creates the child.

the technique will be constitutionally protected and, if so, when its use can be restricted.

The question will be subject to the confrontation between the reproductive right through TGIVF and the limitation of other constitutionally guaranteed rights. And what would be those rights? In the sense of prohibition, we find safeguarding the best interest of the child, the dignity of the human person (considering the technique as an exploitation of the donor and the child) and the prohibition of genetic modifications. Supporting the technique, we find the fundamental rights (and of personality) such as the right over one's own body and the right to develop personality. As mentioned above, it seems that the use of this technique for the mere desire of having a child with genetic material of the parents is not enough. A justifiable (medical) reason that prevents the use of natural reproduction and other (homologous) MAR techniques is necessary. A person cannot wish for a (biological) child by any means. In addition, the fact that these women still have access to heterologous procreation techniques, such as egg donations, with the reproductive right not completely blocked (contrary to what happens with women who are not able to bear a pregnancy with donated gametes) should also be considered.

The absolute prohibition, however, may be a point of contention and discrimination when compared to women who can use PGD. If women (alone or as a couple) can use PGD to avoid the transmission of diseases, will it be disproportionate to forbid the access to TGIVF? It seems to us that an answer to this concern must include effective scientific explanations, namely regarding the actual contribution of the genetic material of each of the subjects to the child's characteristics (to be who he/she will be) and if that contribution effectively causes genetic changes. If we consider the contribution as minimal and with no reflections in the formation of the child's physical and psychic characteristics, it will be unequal to deny access when access to PGD is allowed. Furthermore, it can be considered disproportionate in comparison to the use of heterologous procreation techniques, in which it is effectively known that the donated material will determine the child's characteristics. By contrast, if genetic modification is proven, the prohibition will be justified, taking into account other fundamental values.

We are still in a very early stage to understand the consequences of this technique on the child's development; we believe the future will help us understand which direction to take. Nevertheless, as previously mentioned, we also recognise that regulation may change from country to country. In fact, as we have States that accept any practice of assisted reproduction, we would not be surprised if it became possible for female couples and single women to use this technique, opening the door to more reproductive tourism, human reproduction marketing risks, among others.

e). Surplus embryos

One of the critiques regarding the technique is the destination of surplus embryos[107], which reopens the debate on the embryo's legal status[108]. We highlight the United Kingdom, where it is possible to use this technique on the embryo itself. The use of TGIVF may change according to the status awarded to the embryo and the consequent protection of the right to life. Article 24 of the CPR establishes that the right to life is inviolable. In Portugal, the embryo is not considered a living being, it does not have legal personality (article 66 of the Portuguese Civil Code). However, it deserves legal protection such as the criminal law (criminal abortion) or judicial assistance (genetic counselling). Rui Medeiros and Jorge Pereira Silva refer that "the lawmaker is not constitutionally obliged to award legal personality to the embryo"[109], but that does not mean that it does not deserve protection. So, that protection should be ensured in order to avoid unequal, unnecessary and exploiting practices. Article 9(1) of the MAR law forbids the creation of embryos whose purpose is scientific research. The scientific research in embryos is only lawful with the "goal of prevention, diagnosis and therapy of embryos, improvement of MAR techniques, creation of stem cell banks for transplantation programmes or any other therapeutic purposes" (article 9(2))[110]. For that effect, only "cryopreserved, surplus embryos, with no parenting project, embryos whose state does not allow the transfer or cryopreservation for reproduction purposes; embryos carriers of serious genetic abnormality, in the scope of the preimplantation genetic diagnosis; and embryos obtained without the use of fertilisation by sperm"[111] can be used (article 9(4)(a-d)). Pursuant to article 25 of the mentioned law, the destination of the embryos is established. Paragraph 1 refers that "they should be cryopreserved, being the recipients committed to using them in a new process of embryo transfer within a maximum period of three years."[112] After that period, the embryos may be do-

[107] Cf. SILVESTRE, Margarida, "Embriões criopreservados – que destino", *in Direito da Saúde – Estudos em Homenagem ao Prof. Doutor Guilherme Oliveira*, João Loureiro, André Dias Pereira and Carla Barbosa (coord.), vol. 4, Coimbra, Almedina, 2016, pp. 143-157.

[108] Cf. LOUREIRO, João Carlos, "Estatuto do embrião", *in Novos Desafios à Bioética,* Luis Archer, Jorge Biscais, Walter Osswald, Michel Renaud (coord.), Porto, Porto Editora, 2001, pp. 110-121.

[109] Our translation. MEDEIROS, Rui/SILVA, Jorge Pereira, "Comentário ao art. 24.º da CRP", in *Constituição da República Portuguesa Anotada*, Jorge Miranda/Rui Medeiros (org.), Vol. I, 2nd edition, Coimbra, Coimbra Editora, 2011, p. 517.

[110] Our translation. Article 42 of the CPR establishes the freedom of intellectual, artistic and scientific creation. The freedom of scientific creation includes scientific research.

[111] Our translation.

[112] Our translation. The period can be extended for three more years (cf. article 25(2) of the MAR law).

nated "to other recipient people, whose medical recommendation of infertility advise it, with the decisive factors subject to record, or donated for scientific research pursuant to article 9 (article 25(3)). If donation is consented, "as long as in the six years following the cryopreservation the embryos have not been used for other recipients or in research projects approved in accordance with article 9, they can be thawed and disposed of, by determination of the centre's director"[113] (article 25(6)) and "if donation is not consented (…) the embryos can be thawed and disposed of, by determination of the centre's director, previously reported to the Medically Assisted National Procreation Counsel's President."[114] (article 25(7)). Stela Barbas refers that the freedom of research has limits, it is not absolute, under the risk of undermining constitutional rights, such as, the right to life (article 24), the right to moral and physical integrity (article 25), the right to personal and genetic identity (article 26), the right to freedom and security (article 27) and the right to equality (article 13)[115].

f). Right to anonymity of the female donor versus the knowledge and identification of the female donor and the right to personal identity and free development of personality

The donor's role and her contribution evoke the (traditional) debate if the child that is born from TGIVF will have the right to know who donated the egg and the mitochondrial DNA. How can the confrontation between the right to know the genetic origins and the female donor versus the right to the donor's anonymity be solved? We return to the case of the United Kingdom because it is the only country that has regulated the technique to this date. The English legislation establishes that there is no parental relationship between the child and the mitochondrial donor, assuming no rights and obligations are inherent to the exercise of parental responsibilities. As we have seen, the donor is compared to tissue donors, and not to an egg donor for other fertilisation treatments. Despite being a common problem to the heterologous MAR techniques, the doctrine[116] argues the existence of differences between the disclosure of the donor's identity in TGIVF when compared to other techniques. For the advocates of the prevalence of the right to the donor's anonymity (no right to know who the donor is) the disclosure is not justifiable, since the child does not inherit the donor's physical characteristics (something that can happen in a simple egg donation)[117].

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[113] Our translation.

[114] Our translation.

[115] BARBAS, STELA, *O Direito ao Genoma Humano, op. cit.,* p. 495.

[116] Cf. NEWSON, Ainsley/WILKINSON, Stephen/ WRIGLEY, Anthony, "Ethical and legal issues in mitochondrial transfer", *op. cit.,* pp. 590-591.

[117] *Idem, ibidem.*

The child inherits the parents' nuclear DNA[118]. To protect the best interest of the child (his/her well-being and development), they argue that the impact of the disclosure may be more harmful than the non-disclosure, due to the minimal percentage of DNA contribution. Furthermore, they consider that the disclosure of information may translate the idea that the donor had a larger contribution than the one she actually had[119].

Without entering the field of doctrinal and legal divergence regarding the confrontation between these rights, it is our obligation to leave a note on the Portuguese case. The MAR law establishes the right to the donor's anonymity in detriment of the right to the child's personal identity, born from these techniques (cf. article 15). However, the law foresees the right to know the genetic origins, in other words, information of genetic nature (article 15(2)). The donor's identity can only be disclosed if he/she expressly allows it or in case of "serious reasons recognised by judgement"[120] (article 15(3 and 4)). Well, recently, in April 2018, the Decision no. 225/2018 of the Portuguese Constitutional Court declared the unconstitutionality, with general binding effect, of article 15(4). The CC[121]considered that the rule of anonymity constitutes an "unnecessary restriction to the rights to personal identity and development of personality"[122]. The decision is recent, so the amendments to the law have not been performed yet, but these amendments have generated controversy and the drastic decrease in the number of donors and candidates to heterologous procreation is being broached. Therefore, if the Portuguese legal order regulates TGIVF, it will have, in the current circumstances, to obey the CC decision. In this line of thinking, the child born from this technique will have the right to know who was the egg donor.

3. Concluding notes

Coming to the end of the paper, we would like to leave a few notes on our immersion in a brave new world. The influence and the impact of technology and science in human reproduction is undeniable: the human being stopped reproducing exclusively by natural means and started to increasingly use technology

[118] According to point 6.49 of the HFEA "the child's sense of self would be inherited from their [social] parents".

[119] Cf. NEWSON, Ainsley/WILKINSON, Stephen/ WRIGLEY, Anthony, "Ethical and legal issues in mitochondrial transfer", *op. cit,* pp. 590-591.

[120] Our translation.

[121] Contrary to that delivered in the decision no. 101/2009.

[122] Our translation. COMUNICADO DO TRIBUNAL CONSTITUCIONAL, Acórdão n.º 225/2018, 24 April 2018. [Consult. 24.04.2018]. Available at: <URL: http://www.tribunalconstitucional.pt/tc/imprensa02-bd4453.html>.

as a way to help fight infertility causes, avoid the transmission of serious diseases, etc. Human nature makes humans curious beings, on a continuous search for knowledge and the improvement of life conditions. In fact, intellectual capacity (v.g. human intelligence) is the human being's main engine. Therefore, the same human being that protects and proclaims respect for the dignity of the human person and for other fundamental values, that proclaims respect for natural conception or MAR subsidiarity, is the same human being that promotes scientific research, the eagerness for knowledge and that intends to use technology in the area of reproductive medicine. In this sense, it seems that we are not in Aldous Huxley's imaginary society, we are still far from such an industrial and mechanic view of life. However, we do not deny that science and technology have been building some hypotheses that have led us back to that society. In this regard, the Law arises with a fundamental role in an attempt to "balance" the rampant search of science and technology for knowledge and to guarantee the respect of fundamental principles and values.

TGIVF arises in a fine line between the miracle of reproduction and dehumanisation. It is true that some of its questions (issues) are new, however, it presents common issues with other MAR techniques. The major concern surrounding the technique is related to the eventual change of the human genome and, thus, eventual problems with eugenics that may occur (violating human dignity). We consider that if it is effectively proven that there is an alteration of the human genome, TGIVF should not be accepted and practised. We have serious doubts regarding the effects and consequences of this technique, mainly in the child to be born. We fear the proximity with genetic improvement engineering. Where are we headed? We fear the future of reproductive technology is headed towards *design baby*.

Finally, despite our concerns, we believe that natural human reproduction will not become extinct. It is certain that Aldous Huxley had foreseen a futurist society in Brave New World, but it is also true that twenty-seven years ago the author returned to that society[123] and concluded that natural reproduction will not disappear. Despite the influence of technology, our society is based on values and principles that lead us to believe that assisted reproduction will not become a rule.

[123] In the book "Brave New World Revisited".

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