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PROTECTING AND UNDERSTANDING DIGITAL DESIGNS – THE SHAPE OF THINGS TO COME

Abstract

This study looks into aspects of the new EU design legislation that relate to the subject-matter of digital designs and the extent to which Polish law should adapt for full harmonization. The first part examines the new open-ended definitions of a 'design' and 'product' with a focus on dematerialized items that exist solely through appearance. The second part touches upon several legal parameters serving the identification of the object of design protection. It discusses the visibility requirement embedded by the filing requirements, the eye-perception of design features, and the disconnection of the scope of protection from the designated product category. The last part takes an interdisciplinary approach based on the rules of psychology and design engineering in order to explain the issues that underline human vision, with a focus on the appearance of user interfaces. The understanding of sensory and cognitive determinants of human perception is a useful guide for a judge or examiner in the assessment of the overall impression of two designs. Because of the challenges resulting from the specificity of digital designs, this article argues that Polish law should comprehensively implement the new EU design provisions in order to prevent further difficulties in enforcement.

KEYWORDS

digital designs, intangibles, perception, design engineering, metaverse

SŁOWA KLUCZOWE

wzory cyfrowe, wytwory niematerialne, percepcja, projektowanie, metaverse

1. INTRODUCTION

The EU design law is currently under major revision.[1] On 28 November 2022, the Commission advanced two Proposals for an amended Directive (hereinafter PDD)[2] and amended Regulation (hereinafter PRD).[3] These acts are waiting to be adopted in the nearest future, as the European Parliament will vote on the Directive, whilst the Council on the Regulation. The purposes of the new design package are, among others, to follow the technological advance and encourage innovation, specifically in relation to the creation of 'new product design in the digital age'.[4] Significant amendments pertain to facilitating the registration, use, and enforcement of digital designs. These changes do not surprise, as digital media have started to pervade everyday life, most of activities have shifted online via dedicated apps, e-commerce is flourishing, and the number of those looking for entertainment in the virtual world is increasing. Users moving around in digital and/or virtual environments need to rely on the appearance of digital products, such as the layout of apps, websites, and icons. And it is the appearance of things that constitutes the very object of design protection. However, as a digital design lacks material substance, it is difficult to ascertain whether users/consumers experience it similarly to a regular, tangible product.

The present study addresses several aspects of the new EU design legislation that relate to the subject-matter of digital designs and the extent to which national

[1] This piece is based on my contribution to the panel concerning 'Industrial Designs' at the conference 'Wyzwania dla systemu własności intelektualnej w Polsce' organized by Polish Patent Office and Jagiellonian University in Cracow, 18 May 2023.

[2] See the proposal for Directive with Explanatory memorandum COM(2022) 667 final https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52022PC0667 (accessed 11 January 2024).

[3] See the proposal for Regulation COM(2022) 666 final https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52022PC0666 (accessed 11 January 2024).

[4] Explanatory Memorandum to PDD, *ibidem*, 8, more A. Tischner, *Reforma prawa wzorów w Europie – o reżimie wzorniczym perspektywicznie i (nieco) krytycznie*, "ZNUJ PPWI" 2/ 2023, p. 103.

legislations – such as Polish law – need to adapt for full harmonization. Sections 2 and 3 below discuss the basic parameters of the notion and scope of protection of digital designs, with an emphasis on Polish changes to come. However, the challenges concerning designs used digitally are not confined to the mere adapting the law. In the author's opinion, significant challenges address the perception of digital designs and the understanding of the reasons for which a certain look is conferred on digital designs to raise intended actions from users that communicate with a device. To this end, section 4 contains interdisciplinary remarks about human perception and design engineering rules resulting therefrom. A clarification is necessary at this point. By referring to 'digital designs' this piece does not deal with digital versions (files) of tangible products; it focuses on designs created exclusively for digital use.

2. DIGITAL DESIGNS UNDER THE NEW DEFINITIONS OF A 'DESIGN' AND A 'PRODUCT'

One of the purposes of the new design package is to update and clarify the subject-matter of a design right in order to keep pace with technological development. Although the previous notions of a 'design' and a 'product' were based on open-ended catalogues, the amended versions introduce more detailed definitions. The aim is to confirm the design eligibility of certain items which otherwise have raised doubts due to their immaterial or complex appearance.

2.1. WHAT IS A 'DESIGN'?

Pursuant to Article 3(a) PDD and Article 4(a) PRD, a design still means the 'appearance' of a 'product' or part(s) of it resulting from various features, such as lines, contours, colours, shape, texture, materials, decoration.[5] The last addition indicates 'movement, transition or any other sort of animation of those features'. The latter terms apply especially to digital designs, as the EUIPO has already registered animated icons in the Locarno-class 14.04.[6] The redundancy of words is noticeable – any animation seems to encompass both movement and transition. In the author's opinion, the purpose of the new provisions is to include any kind of dynamic change within the subject-matter of a design, irrespective of

[5] G. Hasselblatt, *Art. 3*, in: G. Hasselblatt (ed.), *Community Design Regulation. Article-by--Article Commentary,* 2nd ed. 2018, pp. 40-46; A. Wojciechowska, *Pojęcie wzoru przemysłowego* in: R. Skubisz (ed.), *System Prawa Prywatnego. Prawo własności przemysłowej. Tom 14B,* 2nd ed. 2017, pp. 64-65.

[6] The author could not find features of a motion registered in another category than 14.04.

whether it relates to the features of shape, words, graphics, colours, etc. According to the EUIPO Convergence Guidelines 'CP7' (i.e. 'Convergence on graphic representations of designs', 2018) an 'animated design' is defined as a sequence of snapshots, that is a short sequence of views showing a 'single animated design at different specific moments in time, in a clearly understandable progression'.[7] It may be stated, that 'animation' may include movement(s) of a complex combination of design features, and not only of a single design element, such as parts/sequences of videogames. This interpretation would enable some conceptual distinction between 'animation' and 'movement', the latter indicating a simple change in position, or between 'animation' and 'transition', the latter implying passing through several identifiable stages.

It seems useful that the future definition of a design (*wzór przemysłowy*) under Polish law (PWP[8]) would include animation – and perhaps the adjacent categories of 'movement' and 'transition' – within an open-ended catalogue of relevant design features. Considering the scarce practice to date, such a step will remove uncertainty over their design eligibility.

2.2. WHAT IS A 'PRODUCT'?

The new definition of a 'product' explicitly departs from any kind of material connotation. It refers to any industrial or handicraft item, 'regardless of whether it is embodied in a physical object or materialises in a digital form' (cf. Article 2(4) PDD and Article 3(2) PRD). Again, this definition is based on an open-ended catalogue, which includes new categories of products.

Already under the old law, the relevant product covered 'graphic symbols' and 'typographic typefaces', which effectively meant that a product could take on a two-dimensional nature.[9] The new law adds 'graphic works or symbols', 'logos' and 'surface patterns'. The consequence is that, ontologically, the subject-matter of a design may easily overlap with that of a trademark or copyright. Design registers are full of figurative signs, colour combinations, logos, and textile patterns.[10] Important CJEU rulings touched upon the issue of the cumulation of rights, and consequently held that one form of protection did not exclude another one, yet acquiring protection under each regime followed the distinct conditions set forth

[7] EUIPO CP 7, pp. 37 at: https://euipo.europa.eu/tunnel-web/secure/webdav/guest/document_library/contentPdfs/about_euipo/who_we_are/common_communication/common_communication_7/common_communication7_en.pdf (accessed 11 January 2024).

[8] Polish Act of 30 June 2000 'Prawo własności przemysłowej' (consolidated version, Journal of Laws of 2023, item 1170).

[9] L. Brancusi, *Wzór wspólnotowy i jego zakres ochrony*, Warszawa 2012, pp. 71-78; Hasselblatt, *ibidem*, pp. 49-52.

[10] https://www.tmdn.org/tmdsview-web/welcome#/dsview (accessed 11 January 2024).

in those particular laws.[11] The possibility to claim several types of protection for identical/similar subject-matter will certainly be maintained also under the new design provisions.

Furthermore, the old law indicated 'get-up' as a product category. Under the EUIPO's practice 'get-up' has easily accommodated the appearance of a line of products, hotel rooms, layout of web-pages or video-games, and various arrangements of features. The current amendments explicitly add 'sets of articles', 'spatial arrangement of items intended to form, in particular, an interior environment', and 'graphical user interfaces' (cf. Article 2(4)(a)-(b) PDD and Article 3(2)(a)-(b) PRD). MPI recent study notes that the consequence is that "the product is indiscernible from its appearance. There is nothing beyond appearance".[12] If a 'product' consists of a spatial arrangement or a graphical user interface, this means that the corresponding 'design' represents that particular appearance of the arrangement/combination of features. However, in the case of a complex arrangement with some variation amongst its elements/design features – such as individual pages of a website, or individual snapshots of an interior design – it will be difficult to assess whether there is one design under multiple views, or several designs linked one to another. Certainly, the filing requirements will play an essential role in clarifying such issues, especially because PDD also aims to harmonize procedural rules over representation of designs and multiple application (cf. Articles 26-27 PDD).

The emphasis on de-materialized types of products clearly seeks to match the increased activities in the digital environment. From the perspective of the above product categories, the notion of a 'digital design' relates to two kinds of 'items'.[13] On the one hand, it may encompass digital designs which are linked to material products, such as the features of apps appearance (screen display, icons) or of video-games uploaded into a smartphone. On the other hand, there may be designs of products mimicking reality, which are created to exist exclusively in the virtual space, such as the appearance of a digital car or bag in the Metaverse.[14]

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[11] C-237/19 *Gömböc*, ECLI:EU:C:2020:296, paras 49, 52–53 (overlap between design and trade mark protection); C-833/18 *Brompton*, ECLI:EU:C:2020:46, paras 30–36 (overlapping between patent and copyright protection); more Estelle Derclaye, *Overlapping Rights* in: Rochelle Dreyfuss, Justine Pila (eds.), *The Oxford Handbook of Intellectual Property* (OUP 2018), 618, A. Tischner, *Kumulatywna ochrona wzornictwa przemysłowego w prawie własności intelektualnej*, Warszawa 2015, pp. 12-26, 32-40.

[12] A. Kur, T. Endrich-Laimböck, M. Huckschlag, *Position Statement of the Max Planck Institute for Innovation and Competition of 23 January 2023 on the 'Design Package' (Amendment of the Design Regulation and Recast of the Design Directive)*, hereinafter 'MPI Study', p. 4, at: https://www.ip.mpg.de/fileadmin/ipmpg/content/stellungnahmen/MPI_Position_Statement_on_the_Design_Package_01-25.pdf (accessed 11 January 2024).

[13] M. Antikainen, *Differences in Immaterial Details: Dimensional Conversion and Its Implications for Protecting Digital Designs in EU Design law*, (2021) 52 IIC 137, pp. 140-141.

[14] For an introduction A. Ramos, *The metaverse, NFTs and IP rights: to regulate or not to regulate*, WIPO Magazine 2/2022 at: https://www.wipo.int/wipo_magazine/en/2022/02/article_0002.

As to the Metaverse, in a communication note of September 2022, the EUIPO recommended that applicants interested in registering three-dimensional designs intended for use in a virtual environment, or in both real and virtual environments, should, nevertheless, include a physical product indication.[15] The reason given is that it would facilitate searches. However, this shows that at the perception level, even a virtual design of a bag still needs to relate to a precise appearance of a bag, even though such a bag would not be used in real life. The EUIPO's requirements reveal the need for clarity in identifying the subject-matter of a (digital) design – a significant determinant of the current amendments.

From the Polish perspective, it seems useful to extend the definition of the 'product' to include the additions brought by the PDD. Already under the old law, 'get-up' was not mentioned by Article 102(2) PWP, which gave rise to queries about the extent to which a loose arrangement of features may enjoy design protection.[16] In order to eliminate any possible doubts concerning their design eligibility, the specification of GUIs, get-up, spatial arrangement and set of articles should be explicitly mentioned by the Polish act.

2.3. THE EXCLUSION OF 'COMPUTER PROGRAMS'

The proposals reiterate the exclusion of computer programs from the definition of a product. Researchers understood it as excluding the protection of the computer code as such, but not the 'look (and feel)' of the software, even before the protection of GUIs was permitted.[17] The MPI Study argues that the exclusion of computer programs sounds a bit passé and should be deleted. One argument reads that it is unlikely for a text, being the visual appearance of a computer code, to fulfil the criteria of novelty and individual character vis-à-vis prior art.[18] Whilst this sounds true in general terms, the issue of protecting written texts may resurface in the case of designs of websites, such as comprising various tabs or 'cookies'. These are examples of eligible designs, as relating to the appearance of the interface, although they may contain large parts of written text. In order to differentiate between the possibility of protecting parts comprising the written text

html (accessed 11 January 2024). The connection of a design to actual goods seems an important parameter to rule on the jurisdictional issue of the choice of law to be applied in an infringement in the online environment, more E. Rosati, *The localization of IP infringements in the online environment: from Web 2.0 to Web 3.0 and the Metaverse*, „JIPL&P" 10/2023, pp. 726-727.

[15] https://euipo.europa.eu/ohimportal/en/web/guest/news-newsflash/-/asset_publisher/JLOyNNwVxGDF/content/id/9999412?pk_campaign=keyuser-newsflash-September-2022&pk_kwd=en (accessed 11 January 2024).

[16] L. Brancusi, *Graficzny interfejs użytkownika (GUI) jako wzór przemysłowy*, "PPH" 8/2018, pp. 30-31.

[17] O. Ruhl, *Gemeinschaftsgeschmacksmuster. Kommentar*, 2nd ed. 2010, p. 56.

[18] MPI Study, *ibidem*, p. 5.

of a GUI vis-à-vis the text of a computer code, the author sees the usefulness of a normative exclusion of 'computer programs'. For these reasons, a similar exclusion should be also present in the Polish act.

3. THE PARAMETERS OF DEFINING THE SCOPE OF PROTECTION OF A DIGITAL DESIGN

The following part discusses the rules concerning the identification of the object of design protection, the type of relevant design features and the link to the product category. By means of exemplification, the analysis focuses on digital designs. Each of these issues is put in the perspective of the necessary amendments to the Polish law.

3.1. IDENTIFYING THE OBJECT OF PROTECTION

An important addition in the new law is the provision pertaining to the 'object of protection' of a registered design. Pursuant to Article 15 PDD and Article 18 PRD, protection is conferred only to the features of appearance which are shown 'visibly' in the application for registration. The provisions of Recital 18 DD and Recital 10 RCD explain that design features "do not need to be visible at any particular time or in any particular situation of use in order to attract protection". However, the specific requirement of visibility 'during normal use' of a product will still apply to designs of 'component parts of a complex product'. It results that, apart from the latter category, even internal features of a product, which become visible during consumption (e.g. motifs of the inner part of a cake or an ice-cream), or features visible when the device is turned on (e.g. the GUI of a computer program), may enjoy design protection under the condition of being clearly displayed in the application for registration.[19] This requirement is strengthened under the new Directive by the addition of Articles 25 and 26 PDD which contain procedural details of the application, such as the compulsory content based on the representation of design which governs the application. The new law still allows the Member States to include word description, as a non-compulsory part of an application for registration under national law. However, sole representation of the design will determine the scope of protection of the design.

The new visibility requirement needs explicit implementation into the Polish act. Under the old law, the protection of designs of the inner parts of a product

[19] Tischner, *Reforma*, *ibidem*, pp. 106-108; MPI Study, *ibidem*, p. 2.

raised reluctance in the Polish practice.[20] Furthermore, the introduction into the PDD of explicit rules concerning the content of applications, the means of representing a design and the conditions of multiple applications will also require proper implementation via modification of the current Article 108 PWP. Due to the on-going legislative process, a detailed discussion of these rules seems to be premature.

At this point, it is worth noting that the representation of a design is set to meet the criteria of being "clear, precise, consistent and of a quality allowing for all the details of the matter for which protection is sought to be clearly distinguished and published" (Article 26(1) PDD). These terms recall *Sieckmann* criteria which have served to assess the eligibility of signs as trademarks with regard to their capability to denote 'clear and precise-subject matter'.[21] The requirement of consistency between different parts of a design application may raise similar issues of interpretation as it has occurred in the EUTM practice.[22] The complex appearance of digital/multimedia designs is particularly challenging. Already under current EUIPO guidelines, the sequence of views of an animated icon or GUI ought to be visually related. It was the applicant's responsibility to show how the views connect to one another, whilst giving a clear perception of the movement/progression.[23] Despite many registered GUIs, invalidity or enforcement practice has been scarce, especially as concerns issues of coherence and clarity of the subject-matter. Taking the example of several views of an animated website, should the appearance of every page contain a certain amount of common elements in order to ensure the necessary visual link between all pages? Or would it suffice to have a link between every two subsequent pages, yet, not necessarily throughout the whole webpage, in a way that the first and last page may not even share common elements? This kind of queries seem pertinent, bearing in mind that the identification of the subject-matter of a design consisting of a combination of features is a pre-requisite of comparing it to the appearance of similar designs for invalidity or enforcement purposes. The author argues in Part 4 why registers and courts may face difficulties in understanding the real nature and the reasons why digital designs of interfaces look like they do, if visual perception is not supported by in-depth knowledge about design engineering rules.

[20] J. Sieńczyło-Chlabicz, *Unieważnienie i wygaśnięcie prawa z rejestracji wzoru przemysłowego*, Warszawa 2013, pp. 69-72; cf. K. Szczepanowska-Kozłowska, *Pojęcie wzoru przemysłowego – między funkcjonalnością a estetyką*, "PPH" 3/2010, pp. 13-14.

[21] C-273/00 *Ralf Sieckmann v. DPMA*, ECLI:EU:C:2002:748.

[22] A. Kur, *Acquisition of Rights*, in: A. Kur, M. Senftleben (eds.), *European Trade Mark Law. A Commentary*, OUP 2017, pp. 92-103.

[23] EUIPO CP 7, *ibidem*, p. 37.

3.2. THE SPECTRUM OF RELEVANT DESIGN FEATURES

The legislative developments on the visibility requirement support the view that the subject-matter of an EU design remains restricted to design features that are perceived solely by the eye. This means that audio, touch and features perceived by other senses cannot enjoy EU design protection.[24] Amongst such items, the audio-layer of digital products seems the most discriminated. However, it should be kept in mind that items perceived by various senses may be eligible to trade mark protection. Although the EUIPO practice currently refuses trade mark registration of perfume, haptic, and tactile marks – until future technology would ensure clear and objective subject-matter – audio, motion (including gesture) and multi-media marks have already been successfully registered.[25] Trade mark protection may be indefinitely renewed as long as the sign is put at trade and registration is conferred after substantive examination of applications. By contrast, design protection, limited in time up to 25 years, is granted only under a formalities check.[26] If a design right is sought to be an easily granted tool to capture fast-moving innovation, then the design system needs certainty anchored into some objective frames. Requiring eye-perception from a design's subject-matter is a way of ensuring the legal certainty needed by all market actors. Certainly, these issues remain subject to further scrutiny, as technological advances may foster the registrability of new types of designs.

3.3. FAREWELL TO THE PRINCIPLE OF SPECIALIZATION UNDER NATIONAL LEGISLATIONS

Under the old Directive 98/71/WE, national legislations were allowed to register designs in specific classes of products. In such a case, the scope of a design right was correlated with the product category(ies) chosen by the applicant. An example was Polish law that applied to designs the principle of specialization known from the trade mark law. Pursuant to Article 105(5) PWP, the extent of a design right is confined to the category(ies) of product for which the application was filed.[27] By contrast, the provision of new Article 25(3) PDD stipulates that neither the indication of the products or a description (if permitted by the national law), shall affect the scope of protection of a design. These rules are modelled

[24] Ruhl, *ibidem*, pp. 59-62; Hasselblatt, *ibidem*, p. 38.

[25] S. Geiregat, *Trade Marks in Sound and Gestures: A Critical Analysis of Two Non-Traditional Signs in the EU*, GRUR Int (2022) 71(8) 702, pp. 706-713.

[26] J. Sieńczyło-Chlabicz, *Rejestracja jako warunek ochrony przewidzianej dla wzorów wspólnotowych zarejestrowanych*, (in:) M. Poźniak-Niedzielska, J. Sieńczyło-Chlabicz, *Europejskie prawo wzorów przemysłowych,* Warszawa 2015, pp. 61-78.

[27] Critically, K. Wernicka, *Art. 105*, in: Ł. Żelechowski (ed.) *Prawo własności przemysłowej. Komentarz*, Vol. VIIIA, Warszawa 2022, pp. 976-977.

upon the current Reg. no 6/2002 which lays down that product indication serves only administrative purposes, without affecting the scope of protection of the conferred design (Article 36(6) Reg.).

These amendments will require explicit modification of national laws, such as Polish PWP. The consequence will be that the scope of protection of a design and related validity or enforcement issues will be disconnected from the designated product category. In practice, two-dimensional designs may be enforced against, or challenged by, three-dimensional designs, and vice-versa.[28] For instance, a graphic symbol displaying a doll may extend its scope of protection also towards the use of the same or similar design in a real doll. Furthermore, even a three-dimensional design registered for one type of a product may raise claims vis-à-vis the use of an identical/similar design for a different kind of product, such as the model of a real car versus a toy-car, or the design of a laundry ball versus a ball used as a massage tool.[29]

By the same token, similar rules should apply when a digital design is used alternatively, once as a virtual design, and once in relation to a real product. In the author's opinion, the use of a digital design in the virtual environment, such as the Metaverse, even though it is meant to be a parallel world, does not allow to simply copy that which exists in the real world. In other words, if the state of art of virtual environment comprises designs identical or similar to those used in real life by other parties, this gives grounds to infringement/invalidity claims. And vice-versa, a virtual design may constitute a relevant antecedent towards a subsequent design embodied in a real product.

Irrespective of any dimensional shift and way of use, what bears significance is the appearance of the designs at issue. The comparison of two designs applied to two different kinds of products or to the same product category, yet used in the real versus virtual world, will depend on assessing the scope of protection of the designs. The latter outcome depends on the perception of the informed user and the scope of the designer's freedom of creation. These are two normative, fictional criteria, which any decision-taker, patent office or court, has to define and use them as 'the lens' to compare the designs at issue.[30] Because of their normative character, reference to expert opinions is limited, even with regard to the

[28] Antikainen, *ibidem*, pp. 159-162; Brancusi, *Wzór…*, *ibidem*, pp. 289-293; K. Szczepanowska-Kozłowska, *Naruszenie prawa z rejestracji wzoru przemysłowego*, (in:) Skubisz (ed.), *System…, ibidem*, pp. 309-310.

[29] Decision of BoA EUIPO in case R 84/2007-3, *Ferrari v. Dansk*, at https://euipo.europa.eu/eSearchCLW/#basic/*///number/84%2F2007-3 or UK judgment in *Green Lane...v PMS International Group* ...[2008] EWCA Civ 358 (England and Wales Court of Appeal, Civil Division), 23 April 2008 at https://www.casemine.com/judgement/uk/5b46f1f62c94e0775e7ef1b2, extensively D. Stone, *European Union Design Law: A Practitioners' Guide*, 2nd ed. Oxford 2016, pp. 170-175.

[30] Sieńczyło-Chlabicz, *ibidem*, pp. 101-103, Szczepanowska-Kozłowska, *ibidem*, pp. 300 and 311; J. Brückner-Hofmann, *Art. 6* (in:) Haselblatt, *ibidem*, pp. 91-93, 131.

designer's freedom. The decision is taken by the judge/examiner upon the body of evidence and guided by his/her reason and experience. However, the latter depends on the understanding of what lies before the eyes. The core issue of any design assessment relies on perception. The following section is an invitation to broaden the perspective.

4. SEEING THROUGH AND UNDERSTANDING DIGITAL DESIGNS

Do we perceive exactly what is in front of our eyes? If two persons look simultaneously at the same surroundings from the same place, do they see the same thing? What influences the perception of a digital design being a combination of various design features, for instance an intangible digital design represented by means of two-dimensional graphics versus a snapshot of a video film? As noted above, these queries sound relevant each time an examiner or judge must identify the overall impression of a design through the eyes of an informed user and consider the determinants of a designer's freedom. However, answering such questions should go beyond legal reasoning based on assumptions and common knowledge. An interdisciplinary insight from the field of psychology and design engineering seems particularly useful.

The following remarks from the work 'Teoria widzenia' (*Theory of vision*) of Władysław Strzemiński, Polish theoretician of art and avant-garde painter, serve as a useful introduction to what perception means:

"There is a reciprocal influence of thought on vision and vision on thought".

"Seeing is not a passive reception of visual sensations. The experiences we receive are subject to mental analysis; we confront them with the corresponding sections of reality, and we explain the resulting interrelationships and causes: what are the sensations and what they say about the objectively existing world around us. Thus, there is not only a passive physiological perception of visual sensations, but alongside it: the active cognitive work of our intellect".[31]

These words tell us that we see only what our mind enables us to see. What we see depends on what we have been taught to see from our previous experience, on what current circumstances enable us to see, and on what we intend to see. Neuroscientist David Eagleman emphasizes that all sensory experience is not a 'direct

[31] Władysław Strzemiński, *Teoria widzenia*, post mortem 1958 (reprint 2016 Warszawa), 51, translation by LB of the text: "Istnieje wzajemny wpływ myśl na widzenie i widzenia na myśl. Widzenie to nie tylko bierny odbiór doznań wzrokowych. Otrzymane doznania poddajemy analizie myślowej, konfrontujemy z odpowiadającymi im odcinkami rzeczywistości, wyjaśniamy sens powstałych stąd wzajemnych związków i przyczyn: jakie doznania i co mówią o obiektywnie istniejącym świecie. Istnieje więc nie tylko bierny fizjologiczny odbiór doznań wzrokowych, lecz obok niego – czynna poznawcza praca naszego intelektu".

experience', but 'an electrochemical rendition' of the brain which "compar[es] the signals it receives from the different sensory inputs, detecting patterns that allows it to make the best guesses about what's 'out there'".[32]

Psychology confirms that the way of seeing things depends on how our mind constructs images of the perceived objects by inferring and interpreting the sensory stimulation upon the knowledge acquired through learning and memory.[33] Falkowski explains it through the term of 'plasticity' of the human mind which may generate different pictures based on the same stimuli – for example two persons looking at the image depicting the word 'liar' written in white against black background may see it as a word or as a male profile.[34] This corresponds to the rule of selective perception. In the field of vision, we see what we are looking for: two persons looking at a crowded street from the same place will certainly notice different things.[35] The rule that looking for the content that an addressee expects to receive dominates her vision and eliminates the possibility of seeing other details, was verified by art theoreticians through experiments. Participants were shown several versions of a branded name (logo) written in various fonts, bolding style and composition – some people did not notice any differences between the graphic variants because the semantic layer (the word) was the same.[36] Wróblewski also argues that the contours of a perceived item may take different meanings, depending on the proximity with other objects, on the setting and sequence of images and words, on the overall composition.[37]

In the case of a composition consisting of the layout of a digital design (a webpage or app), users may perceive the meaning and significance of displayed elements differently. What and the order in which a user perceives the design features of an interface determines the quality of the communication with the device and the performance of tasks. There are specific rules of designing the look (and feel) of software applications for them to appear intuitive and easy to handle. Users should not think too much about an interface which should facilitate the use of a device. Because human psychology determines perception, and per consequence the appearance of designs, the following findings refer to a well-known design manual of user interfaces 'Designing with the Mind in Mind' authored

[32] D. Eagleman, *The Brain. The Story of You*, Canongate 2016, pp. 41-42.

[33] A. Falkowski, *Podobieństwo oznaczeń a niebezpieczeństwo wprowadzenia w błąd: perspektywa psychologiczna*, (in:) R. Skubisz (ed.), *Znaki towarowe i ich ochrona*, Warszawa 2019, p. 98.

[34] Falkowski, *ibidem*, 100 referring to an example of visual illusion created by the New York artist Paul Agule in 1987.

[35] A. J. Wróblewski, *Sztuka widzenia*, ASP Warszawa 2012, p. 96.

[36] Wróblewski, *ibidem*, p. 98.

[37] Wróblewski, *ibidem*, p. 79. Changing the order of the same photos may change the meaning of the message: a happy or a tragic picture, pp. 109-111.

by Jeff Johnson[38] which explain the elements that underline the appearance of user interfaces. The topics were chosen in consideration of their relevance for the understanding of the similarities shared by such designs and their impact on the overall impression.

The first and most important are the *Gestalt* principles originating from the pioneering works of German psychologists at the beginning of the 20th century, who advanced the thesis that human perception was holistic – looking at any complex image brain creates unconscious shortcuts (forms, patterns, structure) to convey meaning to what results from the sensory stimuli.[39] The following *Gestalt* rules apply to user interfaces:[40]

- Proximity – objects, even dissimilar, placed near to one another appear grouped
- Similarity – objects looking similar appear grouped
- Continuity – in case of visual ambiguity or missing information, our visual system fills in the gaps so that to perceive whole objects
- Closure – visual system closes open or incomplete figures so that to see whole objects
- Symmetry – the complexity of a whole is reduced by searching for symmetry via organizing and interpreting data accordingly
- Figure versus Ground – the visual field is separated into foreground/figure and background (for example, if two items overlap, the smaller one will be seen as a 'figure')
- Common Fate – objects moving together (e.g. animation), are perceived as 'grouped', sharing the common fate of movement
- Combination – *Gestalt* principles are interrelated and work in combination

Other important pieces of guidance relate to eye-capabilities, colour perception and eye-synchronization with movement.

All humans see better in the centre of our visual field, called the fovea, than on sides.[41] For this reason, important things should always be placed in the middle of the layout. However, certain things can be captured by the peripheral vision, that is colour, movement, and font. The shape of letters, though, is not well seen peripherally. Also, peripheral vision works better in the dark.[42]

Colour vision is limited. Retinal cone cells structure the signals into three colour-opponent channels, that is red-green, yellow-blue and black-white. These

[38] J. Johnson, *Designing with the Mind in Mind. Simple Guide to Understanding User Interface Design Guidelines*, 3rd ed., Morgan Kaufmann Elsevier 2021.

[39] Those were Max Wertheimer, Wolfgang Köhler, Kurt Koffka, see K. Koffka, *Principles of Gestalt Psychology*, Routledge 1935 (reprint 2013). Examples of *Gestalt* rules at work: https://www.superside.com/blog/gestalt-principles-of-design (accessed 11 January 2024).

[40] Koffka, pp. 106-210; Johnson, *ibidem*, pp. 15-29.

[41] Johnson, *ibidem*, pp. 57-61.

[42] Johnson, *ibidem*, pp. 61-3, 77.

are the most distinctive colours.[43] Vision is much more sensitive to contrasting colours, edges and quick changes, than brightness level – pale colours are hard to distinguish. Many factors influence colour vision. The presentation, size and mutual proximity of patches of colour determine the way we perceive differences in colours. Also, a greyscale background makes different colours look similar.[44] These findings explain how wording, graphics and features of colours (in terms of hues and intensity) should be placed within the overall layout of a digital interface so as to ensure the optimal perception of all details.

However, apart from sight determinants, there are laws related to the optimal eye-hand coordination (Fitts' law), which enhances the usability of a device. Fitts' law reads that the time necessary to hit a target depends on the size of the target and its distance with the pointer's starting position.[45] It follows the design rules to make important targets bigger and placed near the edge of the screen, to leave enough space between targets, and also to design menus in such way as to be easily activated with a thumb.[46]

Circling back to cognitive parameters, the way our attention works when perceiving things is connected to how human brain operates within two interrelated systems of unconscious mind and conscious awareness.[47] Psychology confirms that there is 'system 1' of the intuition self, which operates automatically, effortlessly and involuntarily, and 'system 2' of the conscious reasoning self, that conducts effortful mental activities and controls the input of impulses and associations of system 1.[48] Some mental activities are completed involuntarily by system 1, such as detecting that one object is more distant than another, reading words on billboards, recognizing known faces, whilst other activities require specific attention of system 2, such as looking out for one detail, comparing two items for overall value, or focusing attention on an item in a crowded space.[49] However, our brain optimizes effort. This means that system 2 is 'lazy' and restricts energy to necessary activities, whilst choosing to 'run on automatic pilot', that is leaving many tasks to be guided by system 1.[50] These findings serve to understand several design strategies that optimize the amount of data which human brain may capture and process to achieve pre-defined design goals.

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[43] Johnson, *ibidem*, pp. 43-51.

[44] Johnson, *ibidem*, pp. 53, 56.

[45] https://www.interaction-design.org/literature/topics/fitts-law (accessed 11 January 2024), Johnson, *ibidem*, pp. 225-30.

[46] Johnson, *ibidem*, p. 233.

[47] Eagleman, *ibidem*, pp. 77-105.

[48] Nobel-prize winner Daniel Kahneman has named these systems as 'System 1' which thinks fast, and 'System 2' which thinks slow, more D. Kahneman, *Thinking, Fast and Slow*, Penguin 2011, pp. 20-21.

[49] Kahneman, *ibidem*, pp. 21-22.

[50] Kahneman, *ibidem*, 31, Eagleman, *ibidem*, pp. 89-92.

The first rule relates to the content and structure of complex compositions. Experiments have shown that the number of ideas/concepts that can be retained simultaneously by the working memory is 'five plus or minus one'.[51] 'Working memory' represents a short-term memory – as compared to the other type of 'long-term memory' – which has limited capacity, meaning that attention selectively chooses certain items/events to remember, whilst neglecting others. Putting this into the perspective of design interfaces, a complex combination of design features may capture the attention/working memory of a user only to the limited extent – defined by the number 'five plus or minus one'.[52]

In connection with the above findings, there is a difference between the capability of recognition and recall. Recognition is based on perceptual input (visual, acoustic, etc.), which occurs automatically – we recognize certain things instantly. A recall occurs with more difficulty, because it stems from long-term memory which requires reactivating old neural patterns formed on the basis of the same/similar perceptions.[53] It follows the design rule that using pictures is optimal to inform fast about the function and commands of a device. For this reason, designers use icons that depict physical objects or tasks in order to convey information about function, based on recognition.[54] Last, but not least, design rules are formulated to ensure and increase the 'responsiveness' of a system/device, defined upon users' expectations in terms of time performance and general user satisfaction.[55] However, the latter depends on brain's reaction to any sensory input. Neurophysiology teaches about the speed needed by the human brain to process different sensory input, such as the time to visually identify an object (0,25 sec), to see the number of four/five items in a visual field (0,2 sec), the maximum interval for visual fusion in case of successive images (0,05 sec).[56] Such measurements specifically apply to designs used interactively. For instance, considering the time-limits of the human brain, animation and/or movement should be displayed smoothly, with a frame rate of 10-20 frames per second.[57]

5. CONCLUSIONS

The last section shows that there are many sensory and cognitive determinants of human perception. Various neuro-physiological and psychological stud-

[51] Johnson, *ibidem*, pp. 107-109.
[52] Johnson, *ibidem*, p. 123.
[53] Johnson, *ibidem*, pp. 143-147.
[54] Johnson, *ibidem*, p. 149.
[55] Johnson, *ibidem*, p. 236.
[56] Johnson, *ibidem*, pp. 238-39 with further references.
[57] Johnson, *ibidem*, p. 257.

ies explain what we see at a given time. As applied to the digital interface designs, additional constraints flow from their basic functional purpose. Any interface should enable proper and fast communication with the device and its smooth operation. Depending on the purpose of the interface and the actions needed from users, the layout of a digital design will comprise 'specific' elements of a 'specific' appearance that affect human perception in a 'specific' way and trigger relevant reactions. In the author's opinion, the above findings give ground for a more thorough legal discussion about the constraints faced by designers engaged in creating digital designs. In the light of the previous findings, user interfaces do not appear designed 'at random'. Certain design choices are necessary so that a user 'sees' the composition of design features in a way that smoothly guides him/her through the operation of the device.

Going back to the legal steps, the EU design amendments certainly pave the way to registering anything that may be perceived by the eye, regardless of its tangible or intangible nature, provided that it may be framed by the requirements of a clear and precise subject-matter and visible representation. Specifically, arrangements of items, be it the layout of an interface, an interior design, or a graphic composition, will benefit from explicit normative provisions. The door is wide open for protecting digital products. However, Polish law should comprehensively implement all amendments concerning the definition and representation of the subject-matter to prevent subsequent difficulties in enforcement. Future amendments concerning the disconnection of the scope of protection from the product category will certainly give rise to practical difficulties, by challenging the usual comparison of designs when applied to different products. For these reasons Polish law should minimalize the risks of misinterpreting the basics of design protection by avoiding faulty implementation.

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