Marta Woźniak-Zapór

Universal design maturity model in the digital area for the beauty sector

– theoretical foundations

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INTRODUCTION

The growing public awareness of the design of goods and services enables their design to cater to the broadest possible audience. The principles of universal design are widely described in the literature, predominantly from an architectural standpoint.

Adapting organisations to accommodate individuals with various temporary and permanent constraints raises the need to assess the extent to which organisations are prepared to do so. This necessitates developing mechanisms for assessing the level of sophistication a company has achieved in implementing universal design.

A possible approach to assessing levels of maturity may be the concept of organisational maturity. Considering the long-established development of maturity models in management science, it becomes reasonable to draw on this knowledge and, on the basis of this knowledge, create a universal design maturity model.

In this publication, the assumptions for building maturity models, the themes of universal design, accessibility, usability, functionality, tools for measuring and evaluating them will be presented. Building on this, a universal design maturity model encompassing four distinct areas is developed. These are the organisational area, the architectural area, the service area – at the point of service provision, and the area of offering goods and services via digital tools. The last area will be described in detail. In this context, the objectives and practices for each level are described. An audit matrix is also presented to determine the maturity level of the company in the individual criteria for the area of offering services via the website. The study will also describe the beauty industry as a rapidly growing industry in recent years. This is an industry that, in theory, provides services for everyone. Consequently, it is essential to first examine the level of awareness of universal design for all potential recipients of their services. Utilizing the model developed here for internet-based service

and product offerings, it is possible to check the level of maturity of universal design in this area. Subsequent publications will include models developed in detail for the other areas. In the next planned studies, precisely for this fast-growing industry, the achievable and required maturity levels in all areas will be examined and defined in the first instance.

1. UNIVERSAL DESIGN

As defined in the 25 October 2012 UN Convention: "Universal design means designing products, environments, programmes and services to be as universally usable as possible, without the need for adaptation or specialised design. Universal design does not exclude technical aids for specific groups of persons with disabilities where this is needed."[1]

Thus, universal design is about designing spaces, products, services, and other elements, in such a way that they can be used by the largest possible number of users, in the widest possible range and situations, ideally without additional customisation.

Universal design is not just aimed at people with disabilities. The human life cycle means that each of us goes through different periods in our lives from childhood, through adulthood, old age. Everyone can also encounter situations, in different situations that cause dysfunctions or disadvantages. Depending on the situation we find ourselves in, we start to notice limitations, barriers that were previously invisible. The reasons for these situations can vary. Travelling, for example on holiday, a positive event, may cause inconvenience by having to carry a lot of luggage. Various types of fractures also cause problems with mobility and moving to different places. Dysfunctions with which we perceive barriers can be temporary, such as pregnancy, fracture, dislocation or permanent, such as missing a limb. Universal design is therefore designing in such a way that, whatever the circumstances, it is possible to use the designed things without any restrictions.

[1] UN Convention on the Rights of Persons with Disabilities, https://bip.brpo.gov.pl/pl/content/konwencja-onz-o-prawach-osob-niepelnosprawnych [access: 20.04.2023]

1.1. Legislation in force

The following legislation, among others, provides information and guidance on universal design and accessibility.

Primarily, these legislations regulate issues pertaining to non-discrimination, equal opportunities, and the aforementioned accessibility.

Constitution of the Republic of Poland

The Constitution of the Republic of Poland features provisions on equality of rights, such as Article 5, which states: "The Republic of Poland shall safeguard the independence and inviolability of its territory, ensure the freedoms and rights of man and citizen, and the security of citizens, (...), Article 32:1 – All are equal before the law. (...)., or Art. 32. 2 – No one shall be discriminated against in political, social or economic life on any ground".

UN Convention on the Rights of Persons with Disabilities

The UN Convention on the Rights of Persons with Disabilities (as published in the Journal of Laws of 25 October 2012, item 1169) was adopted by the United Nations General Assembly on 13 December 2006. The Convention was signed by the Polish Government on 20 March 2007 and ratified on 6 September 2012.

The Convention aims to protect and ensure the equal enjoyment of the full range of human rights and freedoms by persons with disabilities. The Convention stipulates that persons with disabilities should enjoy rights and fundamental freedoms on an equal footing with other citizens. By signing the Convention, Poland is also obliged to implement the provisions contained therein.

Act of 19 July 2019 on ensuring accessibility for persons with special needs

This Act outlines the methods for ensuring accessibility for persons with special needs. It also defines the responsibilities of public entities in in this regard. Particular attention should be given to articles pertaining to universal design, such as:

"Article 4 (1) A public entity shall ensure accessibility for persons with special needs by applying universal design or reasonable accommodation. (2) A public entity in providing accessibility to persons with special needs shall also take measures to:

1) taking into account their needs in the activities planned and carried out by the entity.
2) eliminating and preventing barriers."[2]

Charter on the Rights of Persons with Disabilities

The Charter was introduced by the Resolution of the Sejm of the Republic of Poland of 1 August 1997 Charter of Rights of Persons with Disabilities (M.P. of 13.08.1997 No. 50 item 475). It contains the provision:

"§ 1. The Sejm of the Republic of Poland recognises that persons with disabilities, i.e. persons whose physical, mental or psychological disability permanently or periodically hinders, restricts or prevents them from living, learning, working and performing their social roles, in accordance with legal and customary norms, have the right to live independent, autonomous and active lives and shall not be subjected to discrimination. The Seimas states that this means in particular the right of persons with disabilities to:
8. live in an environment free of functional barriers, including: access to offices, polling stations and public facilities, free movement and universal use of transport, access to information, opportunities for interpersonal communication."[3]

Strategy for Persons with Disabilities 2021-2030

"Within the framework of the measure, it is planned to adapt the investment and construction process to the needs of persons with disabilities, by taking into account – at individual stages of planning and implementation – the principles of

[2] Act of 19 July 2019 on ensuring accessibility for persons with special needs OJ. 2019 item 1696

[3] Resolution of the Sejm of the Republic of Poland of 1 August 1997 Charter of Rights of Persons with Disabilities , M.P. of 13.08.1997 No. 50 item 475. [access: 5.05.2023]

universal design, application of accessibility standards, introduction of a catalogue of obligatory and optional solutions friendly to future users, designers and investors applying accessibility standards. Adaptation will take into account the obligation of investors to apply a set of necessary accessibility rules at individual stages of the investment and construction process (...).

The measure also includes the collection and dissemination of good practices in the area of ensuring accessibility of tourism, recreation and leisure activities for people with disabilities, on an equal footing with other citizens, both in terms of universal design and reasonable accommodation (...) The adaptation of transport infrastructure will take place evenly with the adaptation of the infrastructure of stations, interchanges, transfer centres and bus shelters, which will comply with the developed regulations in terms of universal design(...)."[4]

Efforts are also to be made to provide access to teaching materials to enable easier reading and understanding of texts, and to enhance textbook accessibility by adhering to the principles outlined in the "Editorial and linguistic guidelines for the development of textbooks and guidelines for universal graphic design of textbooks."[5]

Furthermore, consistent with universal design principles, the design of services and provision of cultural and sporting activities will be prioritized.

1.2. Universal design, inclusive design and accessibility

Universal design, inclusive design and accessibility are terms very often used in the context of the design of products and services made accessible using Internet-enabled remote communication methods and techniques. All of these terms connote enabling products/services/spaces etc. to be used by everyone, without restrictions caused by a permanent, temporal or situational condition.

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4 Disability Strategy 2021-2030, https://niepelnosprawni.gov.pl/download/Uchwala-Nr-27-Rady-Ministrow-w-sprawie-przyjecia-Strategii-1614284683.pdf [access: 4.05.2023]

5 Language editorial guidelines for textbook development and guidelines for universal graphic design of textbooks https://www.gov.pl/web/edukacja-i-nauka/wytyczne-edytorskie-i-jezykowe-do-opracowania-podrecznikow-oraz-wytyczne-do-uniwersalnego-projektowania-graficznego-podrecznikow [access: 4.05.2023]

A number of factors, such as the proliferation of social media, the impact of pandemics, and advancements in communication technology, have made virtually every industry visible on the Internet. Therefore, also in the beauty industry, attention should be paid to the design of websites of, among others, beauty salons, hairdressers or other facilities offering their services in a way that enables them to be used by as wide an audience as possible.

Availability

Accessibility is defined in ISO/IEC 25010:2011(en) as follows: "the degree to which a product or system can be used by persons with the widest range of characteristics and capabilities to achieve a specific purpose within a specific context of use.

Note 1 to entry: Capability range includes age-related disabilities.

Note 2 to entry: Accessibility for persons with disabilities can be defined or measured either as the extent to which a product or system can be used by users with specific disabilities to achieve specific goals with effectiveness, efficiency, risk freedom and satisfaction in a specific context of use, or by the presence of product features that promote accessibility."[6]

Digital accessibility means that websites, applications, and online services are designed in such a way that they can be used by people with various impairments, whether due to disability, age or or various other life circumstances.

Digital accessibility, which ensures that digital solutions are accessible to as many users as possible, incorporating elements that make it easier for people with disabilities to use them, also positively impacts users' reception of content, irrespective of limitations.

The clear arrangement of the elements on the page, the choice of colours which facilitate the reading of the information and the description of the images are useful

[6] ISO ISO/IEC 25010:2011(en) Systems and software engineering – Systems and software Quality Requirements and Evaluation (SQuaRE) – System and software quality models, https://www.iso.org/obp/ui/#iso:std:iso-iec:25010:ed-1:v1:en. [access: 23.04.2023]

for deaf and hard-of-hearing individuals, for the visually impaired (information read by reading programmes) as well as for people without disabilities, but for whom the image is simply not displayed.

Universal design

The fullest definition comes from the UN Convention on the Rights of Persons with Disabilities: "Universal design means designing products, environments, programmes and services to be usable by all, to the greatest extent possible, without the need for adaptation or specialised design. Universal design does not exclude technical aids for specific groups of persons with disabilities where this is needed."[7]

Inclusive design

Inclusive design is about including people with special needs in the design process, designing the product according to their requirements and thus creating a product that can be used by everyone.

In summary, accessibility is related to the ability of a system and a product to be used by people with different abilities and characteristics. It focuses on delineating an understanding of particular disabilities, identifying barriers related to them. On this basis, by applying legal regulations and recommendations in standards, a product is created for people with specific – special – needs.

Universal design involves creating products, among other things, in such a way that they are accessible to all people. Universal design focuses on designing in such a way that, for example, the use of a particular product is not a barrier to anyone, trying to find a universal solution. Thus, it involves analysing the needs of all potential users and developing a product accordingly.

Inclusive design's philosophy begins with creating, say, a product for individuals with special needs and then extending its usability to the wider population. The design process involves people for whom the use of the designed product may be problematic due to temporary or permanent limitations. By defining

7 UN Convention on the Rights of Persons with Disabilities, https://bip.brpo.gov.pl/pl/content/konwencja-onz-o-prawach-osob-niepelnosprawnych [access: 22.04.2023]

limitations, it is possible to create a product whose use will not have barriers for as many users as possible.[8]

Design rules for all

Fair usage

Equitable Use – this implies that the design, product, or service should be both usable and appealing to people with varied abilities and capabilities. This means that the product/service etc. should be accessible without the need to design alternatives, e.g. a ramp for pushchairs but not for people with mobility impairments because of e.g. its width or angle of inclination.

Flexibility in usage

Flexibility in Use – implies that the design/product/service takes into account a wide range of individual user preferences and abilities. This should include options, such as subtitled videos, which allow for either listening or reading, depending on ability and preference.

Simple and intuitive operation

Simple and Intuitive Use – refers to the principle that designs should be straightforward to use even without instructions, i.e. irrespective of the user's knowledge, experience, language skills, ability to operate different types of products/services, etc. An example is a lift interface designed so that users are certain about which button to press determining whether the lift is ascending or descending, and knowing from which side the door will open.

Noticeable information

Perceptible Information – emphasizes the importance of effectively communicating vital information in the design process, regardless of external factors related to the environment such as noise, fog, or internal sensory abilities.

[8] https://testerzy.pl/baza-wiedzy/artykuly/projektowanie-uniwersalne [access: 5.05.2023]

The information should be communicated in different ways, e.g. the interface in a lift designed so that the information is both audible, displayed on the lift screen and also allows the selection of the floor by describing the buttons in Braille.

Tolerance for Error

Tolerance for Error – this principle, in turn, reminds us that everything should be designed in a manner to minimise the risks and adverse consequences of incidents, whether accidental or intentional. An example of this is navigation software that, in the event of an error made by a driver, for example, proposes a new route to reach the destination, correcting the error.

Little effort

Low Physical Effort – this implies that designed products/services etc. should be ergonomic, comfortable and require little physical effort to use. An example of this would be doors that open and close easily, which is particularly important when used by people with reduced mobility.

Size and space allowing freedom of approach and use

Size and Space for Approach and Use – this principle emphasises ensuring that the product, service, or space is comfortably usable in the design process. Convenient space should be provided for approaching and using what has been designed, regardless of the size of the users' physical parameters and their ability to move. For instance, applying this principle in designing laboratories where students of diverse physical characteristics and abilities learn.[9]

[9] https://www.washington.edu/doit/what-universal-design-0 [access: 6.05.2023]

2. THE MATURITY OF UNIVERSAL DESIGN

The growing awareness of social diversity and the varying needs of people in different life situations necessitates a response and modification of services, based on the principles of equal opportunities and non-discrimination. This calls for special attention to improving services to meet the needs of people at risk of exclusion in any area of life.[10] [11] [12] [13] [14] [15] [16] [17] [18]

[10] Nelson LL. Design and Deliver: Planning and Teaching Using Universal Design for Learning. Second ed. Baltimore Maryland: Paul H. Brookes Publishing; 2021. https://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=2891043. [access: 13.06.2023]

[11] Bracken S Novak K. Transforming Higher Education through Universal Design for Learning: An International Perspective. Abingdon Oxon: Routledge Taylor and Francis Group; 2019. doi:10.4324/9781351132077

[12] Lund B. Creating Accessible Online Instruction Using Universal Design Principles: A Lita Guide. Lanham Maryland: Rowman & Littlefield an imprint of The Rowman & Littlefield Publishing Group; 2020.

[13] Murawski WW Scott KL. What Really Works with Universal Design for Learning. Thousand Oaks California: Corwin; 2019.

[14] Galkienė Alvyra Monkevičienė Ona. Improving Inclusive Education through Universal Design for Learning. Cham Switzerland: Springer; 2021. doi:10.1007/978-3-030-80658-3

[15] International Conference on Universal Design Verma I. Universal Design 2021: From Special to Mainstream Solutions. Amsterdam Netherlands: IOS Press; 2021. doi:10.3233/SHTI282

[16] Fovet F. Handbook of Research on Applying Universal Design for Learning Across Disciplines: Concepts Case Studies and Practical Implementation. Hershey PA: IGI Global Information Science Reference; 2021. https://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=2932066. [access: 13.06.2023]

[17] Byrom T. Meeting the Teaching and Learning Challenges in 21st Century Higher Education: Universal Design. Newcastle upon Tyne: Cambridge Scholars Publishing; 2020. https://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=2703116. [access: 13.06.2023]

[18] Strauss R Volz A. Lidwell W. The Elements of Education for Curriculum Designers: 50 Research-Based Principles Every Educator Should Know. New York: Routledge Taylor & Francis Group; 2023. doi:10.4324/9780429321283

According to the provisions of the UN Convention on the Rights of Persons with Disabilities and the Polish Constitution, everyone has the right to equal treatment and societal participation.[19] [20]

The Act of 19 July 2019[21] concerning the assurance of accessibility for individuals with special needs requires public entities to provide facilities for these indivuduals. Public entities, including but not limited to public administration bodies, are obliged to guarantee equal access to their services. In practice, this is done by taking into account the needs of persons with limitations in the activities they plan and carry out by removing barriers including architectural, digital and communication barriers.

Understanding the community's expectations is increasingly becoming a challenge for socio-economic development. Beauty businesses are also becoming one of the entities that are most confronted with the need to adapt services and products to the needs of different groups of people with special needs. These actors provide a range of services to audiences affected by different needs related to their disabilities or temporary limitations. Specifically, this involves the introduction of innovative products and services that take into account the recipient's diverse needs, e.g. in terms of mobility or perception. The Act on Ensuring Accessibility for Persons with Special Needs, in force since 20 September 2019, introduces obligations for public entities with regard to architectural, information and communication accessibility and digital accessibility.

Adapting organisations to cater to individuals with disabilities, encompassing both temporary and permanent limitations, necessitates assessing the extent of organisational preparedness for such adaptations.

This necessitates the development of criteria for evaluating the sophistication of universal design processes. One approach to assessment may be the concept

[19] https://www.gov.pl/web/rodzina/konwencja-o-prawach-osob-niepelnosprawnych [access:]

[20] https://www.sejm.gov.pl/prawo/konst/polski/kon1.htm [access:]

[21] https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20200001062 [access: 15.04.2023]

of organisational maturity. In management science, maturity models have been developed for more than half a century.[22] [23] [24] [25]

Consequently, it can be hypothesised that both theoretical and practical aspects of universal design could be integrated into enhancing the service design process in the beauty industry, considering individuals with disabilities and extending to those with other limitations.

It is therefore important to consider how universal design has so far been taken into account in the creation of beauty products and services, whether services in the beauty industry are available, and how to determine whether a company offers accessible services and, if not, which services it can or should improve. To gauge an organisation's level in embracing universal service design, a universal design maturity model has been formulated. This book focuses on digital services – for which the developed model will be described in more detail.

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22 Nolan, R. L., Managing the Computer Resource: A Stage Hypothesis, "Communications of the ACM". 1973, Vol. 16, No. 7.

23 Nolan R. L., Managing the Crises in Data Processing, 'Harvard Business Review' 1979, Vol. 57 (2).

24 Crosby P. B., Quality is Free: The Art of Making Quality Certain, McGraw Hill, New York 1979

25 von Scheel H., von Rosing G., Skurzak K., Hove M., BPM and Maturity Models, in: The Complete Business Process Handbook, Elsevier 2015

3. MATURITY MODEL – THEORETICAL BASIS OF THE MODEL TO BE DEVELOPED

Maturity is typically perceived as the state of attaining full development or preparedness for a specific purpose. Thus, maturity, including the maturity of an organisation, an institution of administration, can be defined as a certain level of organisational skills, which confirms the preparedness of an entity to perform specific tasks and achieve objectives.[26] [27] In the literature there are many publications on maturity models, models of excellence, ways of creating them, systematisation due to various aspects, comparisons, criticism.[28] [29] [30] [31] [32] [33] [34]

[26] Martusiewicz, J., Szumowski, W.: Modele dojrzałości a modele doskonałości. niezależność czy współzależność na drodze do rozwoju organizacji, Organizacja i Kierowanie, W: Organizacje i Kierowanie, nr1, 2018, Komitet Nauk Organizacji i Zarządzania Polskiej Akademii Nauk oraz Kolegium Zarządzania i Finansów Szkoły Głównej Handlowej w Warszawie ISSN 0137-5466 https://ssl-kolegia.sgh.waw.pl/pl/KZiF/czasopisma/oik/numery/Documents/2018_1_180/martusewicz-szumowski-modele-dojrzalosci-modele-doskonalosci-niezale%C5%BCnosc-czy-wspolzaleznosc-na-drodze-do-rozwoju.pdf [access:]

[27] Skrzypek E.: Wyznaczniki dojrzałości jakościowej organizacji w świetle wyników badań w: „Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu" 2012, nr 264.:Orientacja na wyniki – modele, metody i dobre praktyki, red. T. Borys, P. Rogala, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2012, ISSN 1899-3192 ISBN 978-83-7695-298-7

[28] Bugdol M. (2008). *Zarządzanie jakością w urzędach administracji publicznej. Teoria i praktyka*, Difin.

[29] Kania K., 2013 Doskonalenie zarządzania procesami biznesowymi w organizacji z wykorzystaniem modeli dojrzałości i technologii informacyjno-komunikacyjnych, PN Uniwersytetu Ekonomiczne-go w Katowicach, Katowice

[30] Poppelbub J., Roglinger M., 2011, What makes a useful maturity model? A framework of general design principles for maturity models and its demonstration in BPM, ECIS 2011 https://www.researchgate.net/publication/221409904_What_makes_a_useful_maturity_model_A_framework_of_general_design_principles_for_maturity_models_and_its_demonstration_in_business_process_management [access: 18.03.2023]

[31] Głuszek E., Kacała A., Metodologiczne podstawy projektowania modeli dojrzałości, „Nauki o Zarządzaniu – Management Sciences" 2015", nr 2 (23))

Maturity models emerged in response to the need to measure the progress made by an organisation as part of a continuous improvement process. [34]

> "The OMG (Object Management Group) organisation defines maturity models as an evolutionary process of implementing key practices in one or more areas of the business. The maturity levels adopted allow an organisation to improve its practices, starting from undefined and inconsistent practices and processes, through replicable practices at organisational cell level, followed by comprehensively defined business processes (predictable and statistically managed), and ending with a continuous process of innovation and optimization."[35]

The need to adapt products and services in order to render them accessible to individuals with limitations is becoming apparent in organisations. These limitations are not only due to different types of disabilities, or temporary situations that a person may find themselves in (e.g. a broken limb, pregnancy). Limitations can be caused by migration and epidemic problems.

The degree to which an organisation is adapted to deliver services to people with limitations can be measured and assessed. An appropriate model should therefore be developed. This will be a universal design maturity model to determine the level of maturity of an organisation in providing services to a wide range of users without limitations.

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32 Skrzypek E.: Dojrzałość jakościowa organizacji w świetle teorii i doświadczeń organizacji, Marketing i Rynek, 5/2014, Polskie Wydawnictwo Ekonomiczne, Warszawa 2014, ISSN1231-7853..

33 Skrzypek E.: Wyznaczniki dojrzałości jakościowej organizacji w świetle wyników badań w: Orientacja na wyniki – modele, metody i dobre praktyki, red. T. Borys, P. Rogala, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2012, ISSN 1899-3192 ISBN 978-83-7695-298-7

34 Kosieradzka A., Smagowicz, J.: Analiza porównawcza modeli dojrzałości organizacyjnej, w: Ćwiklicki Marek, Jabłoński Marek, Mazur Stanisław (red.): Współczesne koncepcje zarządzania publicznego. Wyzwania modernizacyjne sektora publicznego, 2016, Kraków, Fundacja Gospodarki i Administracji Publicznej, ISBN 978-83-947017-2-7

35 Ibid.

4. BEAUTY INDUSTRY

According to the latest research, an increasing number of Poles are utilizing beauty and hair treatments. The dynamically developing beauty sector includes: beauty and hair salons, SPA centres, specialist surgeries with manicure, pedicure and depilation services.[36]

> "The Beauty category is not only about cosmetics, but also about beauty services, which are used more and more eagerly by Poles. This applies to as many as 66% of Polish Internet users. Most are women (75%), but also more than half of men (53%). The most popular cosmetic service is the hairdresser (50% of indications). Women are also more likely to appreciate hair removal (19%), body treatments (17%) or nail styling (16%). Men, on the other hand, are slightly more likely to go for facial cosmetic treatments (15% vs. 13% for women).
> Respondents usually use beauty services about once a month (40%). 30% of respondents who use beauty services choose to make appointments by phone. 38% of internet users of beauty services usually go to the same specialists, while 32% do not get attached to a particular salon and change places. So how do you build customer loyalty in this area? What prompts consumers to remain customers of a beauty salon are mainly attractive prices (28%) and professionalism (23%)."[37]

In this situation, do beauty-related businesses need and want to be accessible to people with facing limitations? Are the service facilities architecturally adapted to serve people with various disabilities and temporary or permanent limitations? Are beauty businesses organisationally prepared to serve customers with various limitations? Do the websites of beauty shops, beauty salons, spa&wellness facilities allow both people without and with limitations to search for information, book a stay or make a purchase?

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36 https://gloker.edu.pl/ta-praca-sie-oplaca-branza-beauty/ [access: 18.04.2023]

37 https://www.wiadomoscikosmetyczne.pl/artykuly/rynek-kosmetyczny-dzis-i-w-przyszlosci-raport-beau,68436/3 [access: 17.04.2023]

5. UNIVERSAL DESIGN FOR THE EVALUATION OF DIGITAL SERVICES OF THE BEAUTY INDUSTRY

The detailed guidelines, which form part of the model for the design of digital services for the industry, will be developed on the basis of available knowledge of methods for evaluating websites in terms of usability, functionality and accessibility.

In this connection, it is important to reflect on existing website divisions. It is necessary to analyse possible solutions in terms of usability, functionality and accessibility. This will allow the development of criteria for evaluating individual websites for beauty services. Subsequently, this will make it possible to determine the maturity levels of universal design and, ultimately, be a component of an overall assessment of the organisation's maturity in this respect. Based on this, diagnosing the current state becomes feasible, enabling the planning of organisational goals and the methodologies to achieve them.

5.1. Usability, functionality, accessibility, user experience of websites

The Internet serves as a primary source of information for the products and services we require at any moment. We browse the Internet in search for information on any subject. Initially, websites had only an informative role, but with the development of communication technologies, they now have information, contact, communication, payment, booking, marketing and even educational functions.[38] User requirements for the quality of data, information and services presented have also increased.

[38] https://freelancer007.pl/wpisy/jakie-funkcje-pelni-firmowa-strona-internetowa/ [access: 21.04.2023]

> "Research shows that there is very little tolerance in internet user behaviour for slow-opening or unreadable pages. Users are generally averse to waiting and are equally disinclined to learn how to operate a website. There are no courses or website maintenance. The user should be able to understand how a page works immediately when it is first displayed – after a few seconds at the latest."[39]

For this reason, websites, especially those that should encourage the use of stationary services, should be created in accordance with the principles of universal design, with great attention to functionality, usability and accessibility. The degree to which this is achieved is also an indication of an organisation's maturity in terms of, among other things, universal design.

5.1.1. *Categories of websites*

Websites, essentially collections of thematically related web pages hosted on a single server, can be divided according to their roles[40], functions and purposes. However, they all have certain characteristics. Key characteristics encompass context, content, community, individualisation, communication, connectivity, and commerce.[41] Elaborating on each of these characteristics, it can be said that context in this case will mean the design of the site in question, the way the various pieces of information are arranged on the site. In turn, textual elements, graphic elements, multimedia elements will constitute the content of a given site. Another feature is community, and this – in turn – should be understood as communication with the site's audience. Communication itself, in turn, is simply the exchange of information between users. Customisation refers to tailoring a website to meet user needs and preferences.

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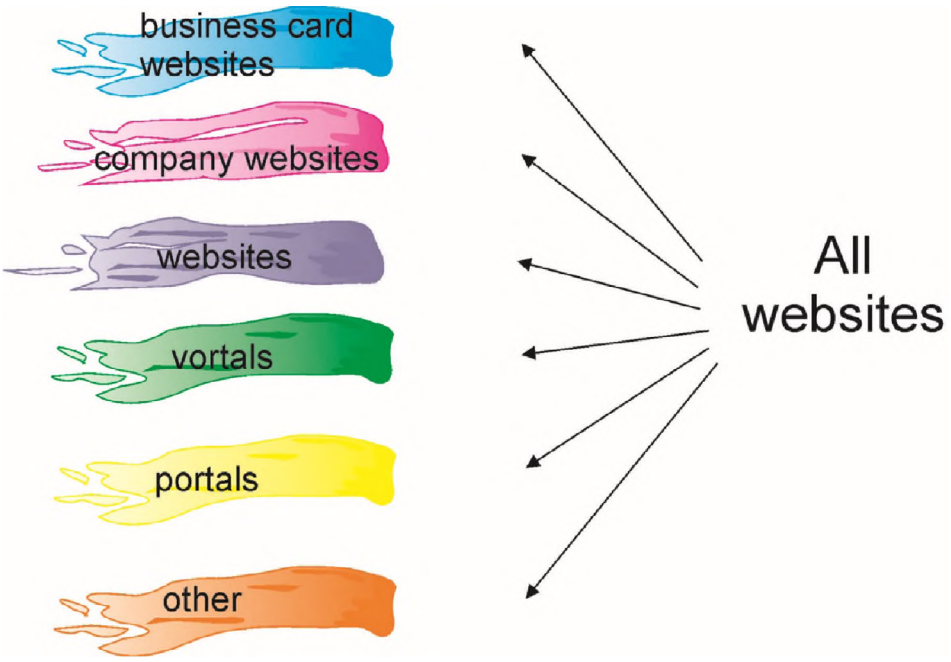
39 Nielsen J., Projektowanie funkcjonalnych serwisów internetowych, Helion Gliwice 2003

40 https://mfiles.pl/pl/index.php/Rodzaje_witryn_internetowych [access: 25.04.2023]

41 Śliwińska K. (2011), Narzędzia i techniki komunikacji marketingowej XXI wieku, Oficyna a Wolters Kluwer business, Warszawa

In the beauty industry, websites present high marketing value. The websites themselves can be divided[42] based on, among other things, their marketing value.[43]



Drawing 1. Breakdown of websites by marketing value

Source: own elaboration,

Pages containing only basic information about an organisation can be perceived as business cards. Such a website contains the most important information in a very short form, so it is very often only contact information and a description of activities. This is directly related to the function of the website, which is only to signal the existence of the organisation on the Internet. It is a low-budget solution, often free of charge. However, it allows companies, which are in the early stages of development or with a low marketing budget, to be found in

42 Nadolny J. „Jakie są rodzaje stron internetowych" https://zdobywcysieci.pl/wiedza/jakie-sa-rodzaje-stron-internetowych, [access: 20.05.2023]

43 Adamczyk J., Rodzaje stron internetowych, http://www.e-marketing.pl/artyk/artyk44.php, [access: 21.04.2023]

search engine results. It does not rank highly compared to the more developed sites with a heavy emphasis on browser positioning activities. Because of their short form, business cards fit on a single page and have no links or sub-pages. Business cards are also used in situations where an organisation's primary website is undergoing redesign, or the company is not active online, but would like to establish a presence and give potential customers the opportunity to get in touch.[44]

Drawing 2. Example of a business card made in a free tool: blogger.com

Source: opracowanie własne

Pages that are more elaborate than business cards are called company pages. They have all the functions of business cards, that is, they contain information about the organisation's activities and contact details. However, they are enhanced with additional elements. Company pages also present the company's full or partial offerings. Information is presented in an expanded form across multiple subpages. The graphic design is also more extensive than on business cards. Websites may contain multimedia, graphic and audio elements, but in no way can they lead to

[44] https://www.intellect.pl/blog/rodzaje-stron-internetowych/ [access: 23.04.2023]

a situation where they obscure the content presented on the website. Company websites are enriched with additional elements such as a blog, discussion forum, portfolio, galleries, search engines. Films and presentations, for example, can be thematically organised across several subpages, presentations divided e.g. thematically into several subpages. Websites are created for a specific company. However, depending on the budget of the organisation, it is possible to use the offers of companies dealing with the creation and positioning of pages on the Internet, as well as free solutions if necessary. It can therefore happen that an inadequately prepared website, instead of attracting customers, can cause them upset and frustration. This is the case, for example, when waiting too long for the content presented to start up. Not being able to reach interesting information without skipping the intro is another reason why users leave the company website early. In turn, the lack of an own domain name can adversely affect the professional image of a company.[45]

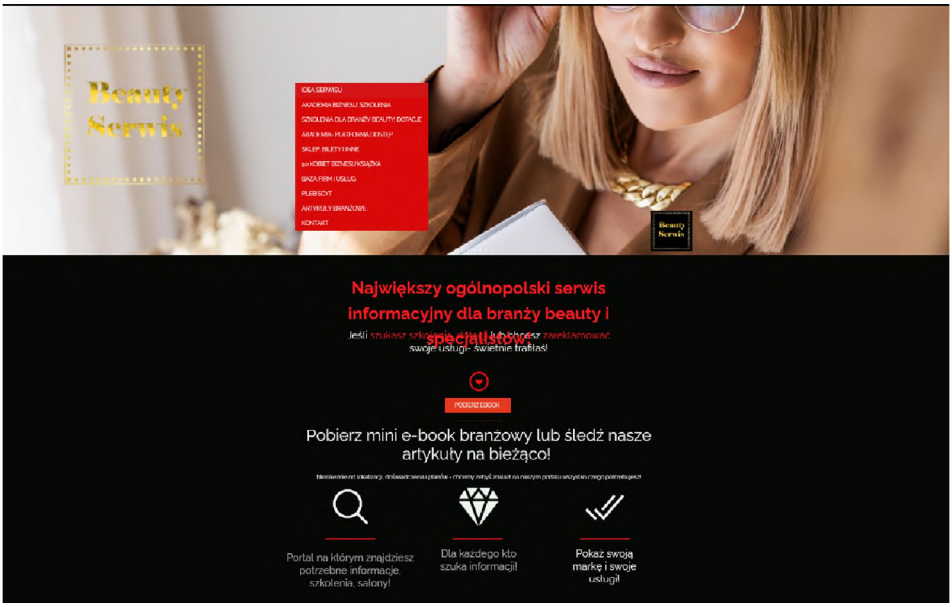
Drawing 3. Example of a page made in the free tool:blogger.com

Source: opracowanie własne

Corporate websites are often highly elaborate. They are an extremely important part of the image of companies. They serve as comprehensive repositories of information about a company. Apart from the content of company websites, they are enriched with articles, news, guides, polls, surveys, and competitions

[45] http://www.agencja-art.pl/oferta,strony,rodzaje.html [access: 24.04.2023]

related to the company's activities. Frequently, they also incorporate an integrated online shop or offer newsletters. Keeping these websites up-to-date requires substantial of creative effort and a rapid response to changes in the company's internal and external environment.[46] Examples of several services can be found in the following figures.



Drawing 4. Beauty industry service, https://beautyserwis.eu/

In contrast, vortals are comprehensive websites dedicated to a single topic. The portals contain articles, news, news on a given topic, information on conferences, news. There are also chat rooms, forums and discussion groups. Vortals focus on one specific topic, usually narrow. For this reason, they are considered a good source of knowledge and information on a given topic. Vortals are also important for marketing, as they offer the possibility to place advertisements or take part in discussions to promote one's own product or service.[47]

46 http://www.milionporad.pl/porady/komputery-i-internet/613/Jakie-wyrozniamy-rodzaje-stron-internetowych [access: 25.04.2023]

47 https://blog.goldensubmarine.com/rodzaje-serwisow-internetowych/ [access: 25.04.2023]

Figure 5. Beauty industry service, https://bbmeet.pl/

Web portals, on the other hand, are a type of website that contains information on a variety of topics, thus reaching a wide audience. Portals provide information on current affairs in various areas of life, from the weather forecast to entertainment, leisure, and serious news. Content search engines facilitate easy access to information on these portals. These portals are structured so effectively that they also allow users to set up their own e-mail accounts or publish their own pages.

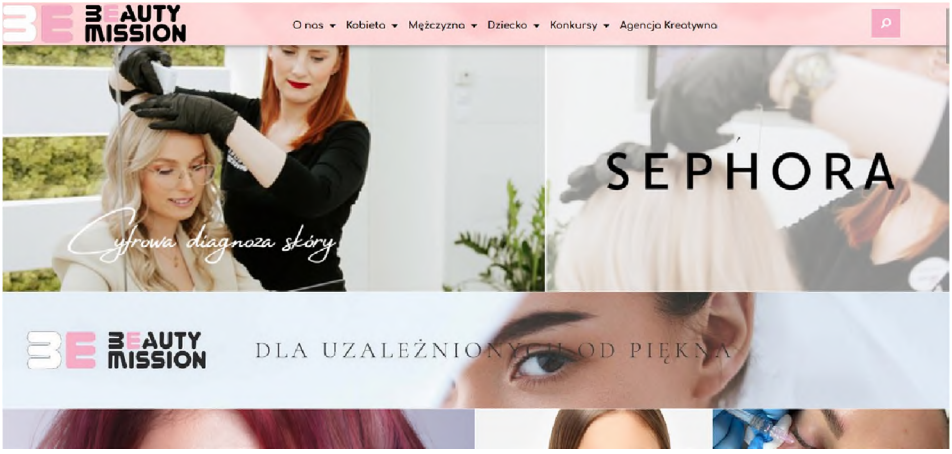


Figure 6. Beauty industry service, https://beautymission.pl/

Complementing the above, there are typical online shops created only for the sale and purchase of goods and services. They have become very popular, especially during the pandemic, yet they fail to continue to captivate consumer interest. This is probably owing to the fact that consumers have become accustomed to online shopping and the convenience this form of commerce brings. Online shops have a clear layout and an automated ordering system. Thanks to the development of courier companies and parcel systems in recent years, they also have the possibility of fast delivery of purchased goods to the recipient.

Figure 7. Expert Portal, https://wartoznac.pl/jak-rozwinac-swoj-biznes-beauty-czyli-dekalog-stylistki-paznokci/

The selection of a website type for a company, organisation, or institution is largely contingent upon the goals to be attained, and the specific needs and profile of the business.

5.1.2. *Usability, functionality, accessibility, user experience*

Developments in technology have made things previously reserved for professionals available to everyone. Nowadays, anyone can create websites using a tool that allows you to design pages without knowing any code. It is enough to place predefined blocks in a planned order. This approach may lead to the creation of an unprofessional website, potentially undermining the corporate image. What is more, it may even worsen this image. Conversely, professionals might prioritise graphic design over content. This can lead to overlooking the expectations of the audience, which is interested in obtaining specific information and performing the planned operations.

As one expert notes "Users invest very little time (very often they don't stay there for more than 10 seconds) looking at a site in the hope that this particular one will be one of the better ones. However, if the site looks too strange or too complex, or if the user is unable to see how the site can solve his or her current problems, he or she will leave as soon as he or she can click the mouse"[48].

Should the website developer neglect these considerations, potential users may not return to the organisation's website. This could result in permanently losing a customer.

For this reason, research and testing are carried out to check the sites for functionality, accessibility and usability. This facilitates the design of pages for easy, swift, and intuitive use by a diverse user base. It is important that these concepts are properly understood. There are many definitions in the literature. Despite this, usability and functionality are sometimes confused with each other. Even in translations of the literature from English, this confusion persists.

Usability is most often translated as functionality, which creates confusion. However, in the IT industry (i.e. also in web design), usability and functionality function as two separate concepts. In addition, the definitions of these terms have

[48] Nielsen J.,Tahir M.: Web functionality. 50 sites without secrets, Helion 2006

been formalised in a relevant standard – ISO 9126-1. However, according to this very standard, "usability is the capability of the software to be understood, learned, used and liked by the user, when used under specified conditions. Subcharacteristics include understandability, learnability, operability, attractiveness, compliance." While functionality means "the capability of the software to provide functions which meets tated and implied needs when the software issued unders pecified conditions. Subcharacteristics include uitability, accuracy, interoperability, security, compliance."[49] Thus, software usability can be understood as the ease of use, understanding of the mechanisms of operation, and willing reuse when needed. Functionality, on the other hand, should be understood as the ability of the software to provide functions that fulfil specific functions during its use.

In addition to usability and functionality, user experience (UX) is also an important issue. User experience is most often understood as "the use of user research and design techniques – including usability testing, user personas and user-centred design – to make a variety of elements usable, useful and enjoyable to experience."[50] "UX designers use a variety of techniques, such as surveys, user interviews and usability testing, to gain insights into user behaviour and preferences."[51]

[49] Fabisiak, L.: Metoda oceny użyteczności serwisów internetowych. Rozprawa doktorska. Szczecin: Zachodnio-Pomorski Uniwersytet Technologiczny w Szczecinie, 2012, http://zbc.ksiaznica.szczecin.pl/dlibra/doccontent?id=28444&from=FBC [access: 22.05.2023]

[50] Beasley, M.: UX i analiza ruchu w sieci. Praktyczny poradnik, Wydawnictwo Helion, 2014 Gliwice.

[51] Ijaz,A:The Basics of UX Design: What it is and Why it matters, https://medium.com/geekculture/the-basics-of-ux-design-what-it-is-and-why-it-matters-1bc6da8186ba [access: 23.05.2023].

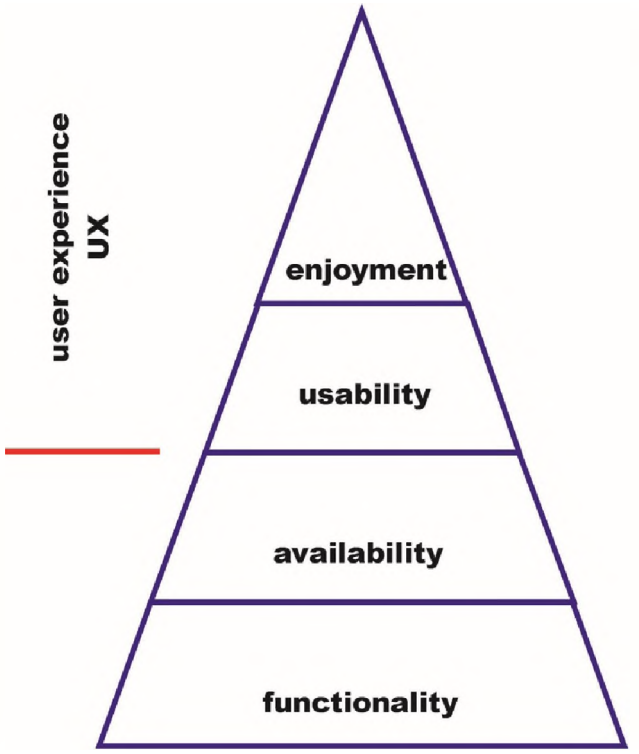


Figure 8. Hierarchy of website user needs

Source: own elaboration based on: http://www.userjourneys.com/blog/difference-ux-usability/ and http://testerzy.pl/baza-wiedzy/hierarchia-atrybutow-jakosci-oprogramowania

Accessibility is defined as the ability to use websites without any restrictions, whether they are hardware-based or due to other limitations.

Websites designed on the principles of universal design ought to be usable, functional, and accessible. This means accessibility for users, regardless of the hardware they are using, – be it a desktop computer, laptop, tablet or smartphone, and regardless of the browser or operating system they are using. Furthermore, accessible websites are usable by all individuals, irrespective of their disabilities or limitations. Websites should also be functional and allow for the use of devices and software to assist users with disabilities, e.g. by using software that reads or magnifies screen content so that it is visible to people with low vision. Websites should also be easy and pleasant to use, as well as effective.

5.1.3. *Web accessibility*

Entails ensuring that websites are universally usable, inclusive of individuals with disabilities or various impairments, irrespective of their computer equipment's limitations.[52] An inappropriately designed website may not only be accessible to people with disabilities. A user who does not have a loudspeaker on his or her computer will not be able to listen to an audio file, and an Internet user who has lost his or her mouse may not be able to navigate a website that is not designed to be used with a keyboard.

For this reason, in 1999, the Web Accessibility Initiative (WAI)[53], an initiative of the World Wide Web Consortium (W3C)[54], produced recommendations for creating accessible websites – the Web Content Accessibility Guidelines (WCAG).[55] In 2008, version 2.0 of the guidelines was published[56], and in 2018 version 2.1 appeared[57], not replacing version 2.0 but extending it. In 2012, the WCAG 2.0 guidelines became the ISO/IEC 40500:2012 standard.[58] Since 2012, Poland has also had in force the Regulation of the Council of Ministers of 12 April 2012 on the National Interoperability Framework, minimum requirements for public registers and information exchange in electronic form and minimum requirements for ICT systems, according to which all entities performing public tasks are obliged to adapt their websites to the needs of persons with disabilities[59].

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52 Zdonek D., Spałek S., Metody oceny dostępności stron internetowych i problemy związane z ich wiarygodnością w: Zeszyty Naukowe Politechniki Śląskiej, Organizacja i zarządzanie, z. 64, 2013

53 You can read more about the WAI initiative on its official website https://www.w3.org/WAI/. [access: 2.06.2023]

54 The World Wide Web Consortium is an organisation that aims to realise the full potential of the World Wide Web by developing protocols and guidelines to ensure the long-term development of the Web. You can read more on the organisation's official website https://www.w3.org/. [access: 27.04.2023]

55 WCAG 1.0 https://www.w3.org/TR/WCAG10/ [access: 28.05.2023]

56 WCAG 2.0 https://www.w3.org/TR/WCAG20/ [access: 28.05.2023]

57 WCAG 2.1 https://www.w3.org/TR/WCAG21/ [access: 28.05.2023]

58 ISO/IEC 40500:2012https://www.iso.org/standard/58625.html [access: 28.05.2023]

59 Journal of Laws 2012, item 526 http://dziennikustaw.gov.pl/DU/2012/526 [access: 28.05.2023]

The WCAG (Web Content Accessibility Guidelines) recommendations apply to all types of disabilities. People with disabilities can be divided into several groups:

- Blind and partially sighted persons
- Visually impaired
- People with colour vision problems
- Deaf people
- Persons with mobility impairments
- People with intellectual and cognitive disabilities[60]

Blind and partially sighted individuals can access computers and the internet using tools like screen readers and speech synthesisers. A screen reader recognises and processes the content of a web page into text, which is then read out by a speech synthesiser. In order for all content to be made accessible in this way, elements of the page must be designed in an appropriate manner.

Visually impaired people often use tools to magnify text or settings for contrast or colour scheme, for which a website should be prepared.

For individuals with colour vision disorders, it is important to remember that they may not see or see particular colours correctly, so colour should not be the only medium of information on a website.

Individuals who are deaf cannot access content presented exclusively in audio formats. In this case, the information should also be provided in an alternative form.

Individuals with physical disabilities might be unable to use a computer through standard input devices like a keyboard and mouse. A website that fails to meet accessibility guidelines can pose challenges in accessing all its information through alternative means.

For people with cognitive impairments, complex text or unintuitive navigation[61] can be a problem.

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60 Paszkiewicz D., Dębski J., Dostępność serwisów internetowych. Dobre praktyki w projektowaniu serwisów internetowych dostępnych dla osób z różnymi rodzajami niepełnosprawności., Stowarzyszenie Przyjaciół Integracji, 2013

61 Ibid.

The WCAG 2.1 guidelines are divided into four main principles:

1. Perceptibility – information and user interface components must be presented to users in a way that is accessible to their senses.
2. Functionality – user interface components and navigation must be usable.
3. Understandability – all information and operation of the user interface must be comprehensible.
4. Robustness – the content must be robustly published so that it can be effectively interpreted by different types of user software, including assistive technologies.[62] In Polish and EU law this is referred to as compatibility.[63]

The guidelines can be met at one of three levels:

- A-level – the minimum standard, indicating that the A-level success criteria have been met.
- Level AA – means that all success criteria at level A and level AA are met, or an alternative version is available that meets the criterion at level A and level AA.
- Level AAA – means that all success criteria at Level A, at Level AA and at Level AAA have been met, or an alternative version is available that meets the success criteria at Level A, Level AA and Level AAA.[64]

[62] Authorised translation of WCAG 2.1 guidelines into Polish https://www.w3.org/Translations/WCAG21-pl/ [access: 20.06.2023]

[63] https://www.gov.pl/web/dostepnosc-cyfrowa/wcag-21-w-skrocie [access: 19.06.2023]

[64] Op.cit Authorised translation of the guidelines

The table below shows the WCAG 2.1 guidelines:

Table 1. WCAG 2.1 guidelines https://www.w3.org/Translations/WCAG21-pl/#conformance-to-wcag-2-1

Principles	Guidelines
Perceptibility	1.1 Text alternative: For each non-text content, an alternative content in the form of text should be provided, which can be converted by the user into other forms (e.g. enlarged print, Braille, synthetic speech, symbols or simplified language).
	1.2 Multimedia: An alternative to time-based media should be provided.
	1.3 Adaptability: Create content that can be presented in different ways (e.g. simplified visual layout) without losing information or structure.
	1.4 Diversity: The user should be able to see or hear the content well – be able to separate the information from the background.
Functionality	2.1 Keyboard accessibility: Ensure that all functionality is accessible via the keyboard.
	2.2 Sufficient time: Ensure that users have enough time to read and use the content.
	2.3 Epileptic seizures: Content should not be designed to provoke epileptic seizures.
	2.4 Navigability: Provide tools to help the user navigate, find content and determine where they are currently.
	2.5 Methods of operation: Making it easier for users to operate functions by various means beyond the keyboard
Understanding	3.1 Readability: The content should be understandable and readable.
	3.2 Predictability: Websites should open, look and act in a predictable way.
	3.3 Assistance with information entry: providing support for the user to avoid or correct errors.
Robustness	4.1 Compatibility: Maximise compatibility with current and future user programmes, including assistive technologies.

5.1.4. *Attributes of a useful website*

Usability is a very important feature. If a designed website is not easy to use and navigating it requires thinking about the next step, users will not return to it again. The same is true if they simply get lost on it or the information, they are looking for on the site is difficult to read or users do not find answers to their questions. Users typically avoid reading extensive manuals or spending long hours learning to navigate a website. Given the amount of information available on the Internet hosted on different websites, the user will simply use another one instead of spending a lot of time on a website that is not useful.

Above all, a website should fulfil its intended functions. Therefore, it can be said that a functional website is one that fulfils these functions. A usable website provides its functions both easily and pleasantly. A website that is functional and useful, on the other hand, is a website that can be called useful[65].

"Usability is a qualitative characteristic that assesses how simple user interfaces are. The word 'usability' also refers to methods of improving ease of use during the design process."[66] Accordingly, five quality attributes have been defined, which include learning speed, efficiency, memorability, satisfaction and errors.

Figure 9. Web usability attributes

Source: Own compilation based on: Nielsen, J.: Usability 101: Introduction to Usability, https://www.nngroup.com/articles/usability-101-introduction-to-usability

[65] Nielsen, J.: Usability 101: Introduction to Usability, https://www.nngroup.com/articles/usability-101-introduction-to-usability

[66] Ibid.

Learning speed (learnability) describes the ease of learning to use, the ability to perform certain tasks on the first visit to a website. It can also be understood as the level of difficulty of performing particular actions on a page or in an application. In practice, this means that a well-implemented user interface should in no way cause users any problems in using it.

Effectiveness, or efficiency, refers to the time it takes to perform a particular action, but where the user is already familiar with the page and knows how to perform the action.

The next feature is memorability. It allows us to determine whether, after a prolonged absence from a website or application (i.e. after a period of prolonged non-use), a user will be able to perform all tasks to the same extent as if he/she were using the website or application on a daily basis.

Satisfaction is an attribute that indicates how satisfied individual users are when using a website. By determining the level of satisfaction, it is possible to obtain information on whether users are satisfied or reluctant when using the website.

The last of the main attributes is errors. This includes designing the website or application to minimize user errors. In the event of an error, guidance should be provided to the user to correct their course of action. This attribute helps identify the frequency and severity of errors, as well as the user's ability to successfully complete tasks despite them. Such analysis determines the effectiveness of the website or application's design.

5.1.5. *Selected ways to test website usability*

Website usability testing can be done in a number of ways. One effective yet cost-efficient method involves, consists of three components. Firstly, several independent users not affiliated with the project should be involved in the research. Next, the test users should be asked to perform several tasks that the target users of the designed website will perform. Subsequently, observation is crucial. It is important to observe how the users perform the various operations, whether they are successful, whether they have problems performing the various operations and, if so, in which places. It is essential to test each user independently

to prevent mutual influence. When testing, those performing the tasks should do so independently, without any guidance from the tester.

When carrying out tests, testers must be selected. Five people are usually sufficient. This replaces large-scale and therefore costly tests. Tests with subsequent users should be carried out after fixing the errors detected during the test with the previous user. This is an iterative design, i.e. after each test, the errors are fixed and the corrected website is checked by the next user.

However, before going into testing it is good to know how users use the pages. The assumption of website designers is usually that all the information designed and placed on the website will be read thoroughly and in detail. However, the reality is quite the opposite. The discrepancies are shown in Figures 10 and 11 respectively. This is because, when designing, it is assumed that users will navigate the site in a similar way. However, this is not the case.

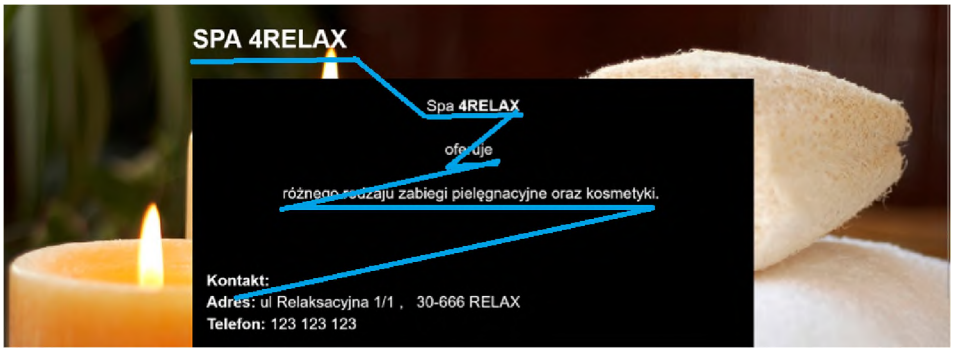

Figure 10. The planned way of viewing the sample page,

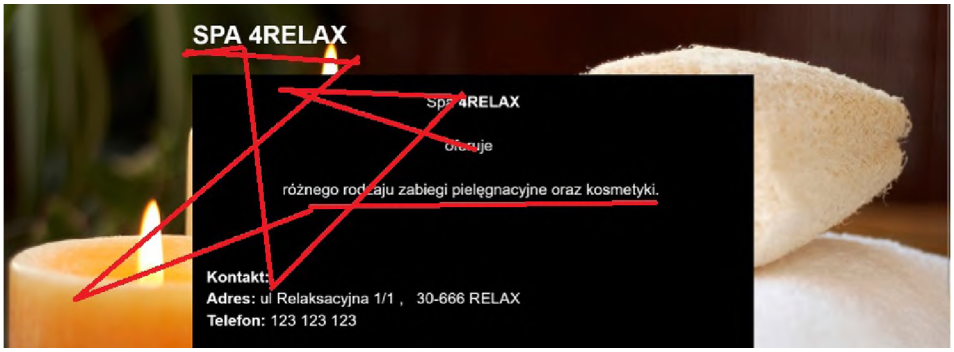

Figure 11. The actual way of viewing the sample information on the page

Steve Krug has compiled insights into how users interact with the Internet. The first fact is that we don't read websites, we primarily scan them. When entering a website, users quickly glance through it looking for content (words, phrases, highlights) that interests them or that they have been searching for. Exceptions to this rule, such as reports, news articles, and detailed descriptions, warrant careful reading, and in detail if they are not too long. This preference for scanning over detailed reading stems from the typical user's time constraints. They are anxious to find the right information and carry out the planned actions. Therefore, they only see what is important to them on the page.

The second fact is that we do not select optimally, but only settle for what we happen to get. This is related to the fact that, when searching for information, we choose the first sensible-looking phrase that fits our search, instead of looking for the best match. This approach is related to the fact that users are usually in a hurry and, in this situation, users often prefer a satisfactory result to no result. When searching, there is always the option to retrace one's steps and go a different route. This approach provides users with a sense of security, as it allows for easy correction of choices if they prove unsatisfactory.

The third fact is that users often do not contemplate the workings of a feature, opting instead to find a way to make it work. Very often some part of the functionality or application is used, sometimes even not in accordance with its actual purpose. But because of the way things work, users continue to do things this way out of habit, perhaps more appropriately. While self-guided problem-solving by users can be advantageous is beneficial, but on the other hand, it can lead to serious errors caused by a misunderstanding of the functionality.

Qualitative (group) research

Qualitative research methods are also valuable for investigating website usability and functionality. Among the most popular are Focus GroupInterviews popularly known as "focus groups" and Individual in-Depth Interviews.

The interest in qualitative research methods emerged in the 1930s. This interest was due to social researchers, sociologists who, wanting to move away from standard, structured questionnaires, sought non-standard interviews. They sought to explain and understand the behaviour of keys, the motives that drive them and

their attitudes, and questionnaire interviews did not offer the opportunity to ask different questions that deepened the topic, depending on the answers given by the respondents. "Among the important stimuli for the development of interest in qualitative techniques was the definition of the so-called interviewer error resulting from the specific relationship between interviewer and respondent that exists in standardised interviews. Non-standardised interviews are not free from it, but it has begun to be considered that they are less exposed to it. The aim has been to achieve a situation where the interviewer's attitude has as little impact as possible on the information he or she obtains."[67]

For this reason, when conducting this type of survey, the aim is to ensure that the presence of the interviewer throughout the survey has as little impact as possible on the answers given by the interviewee.

In the case of an individual in-depth interview, the interview is conducted in a setting outfitted with audiovisual recording equipment. In the case of research where only audio recordings are sufficient, it is possible to conduct the interview anywhere. However, in the case of research on website usability and functionality, it seems necessary that, during the survey, the tasks performed by the respondent are recorded in such a way that analysing the respondent's specific interactions with the computer screen. It is imperative to select respondents who accurately represent the target user group. During the survey, all activities are carried out according to a scenario. The scenario itself should include possible response paths. For each aspect of the study, a set of questions should be prepared, enabling consistent interviewing across multiple interviewers. The interviewers themselves, however, are free to choose the order of topics written in the scenario. Interviewers should be trained in conducting such activities, should respond to statements made by respondents, and should ask successive questions as appropriate. As interviewers should not sway the respondents' answers, the situation in which the survey is conducted should be as natural as possible for the user.

A different situation is encountered with focus group interviews. "Focus group interview (FGD), otherwise known as focus group interview, belongs

67 Nicińska, M.: Indywidualne wywiady pogłębione i zogniskowane wywiady grupowe – analiza porównawcza, ASK, 2000, nr 8, ,https://kb.osu.edu/bitstream/handle/1811/69503/ASK_2000_39_50.pdf

to the group of qualitative methods. Its core involves facilitating a structured discussion around pre-identified survey topics. This interview is conducted by a qualified moderator and documented (audio and video recordings)."[68] In a focus research, the interviewer analyses the statements of the research participants. This process enables the validation of pre-established hypotheses.

Similarly, to individual in-depth interviews, the focus group participants must fulfill specific criteria. Participants in the focus group interviews should ideally be strangers to each other. This avoids a situation where previous relationships between group participants influence the course of the survey, the answers given by the respondents. This type of survey should last a maximum of two hours, and the survey comprises 4 to 8 sessions, each with different respondent groups, to vary perspectives. The differences themselves should arise from the nature and purpose of the survey. In the case of a focus group interview, an important role is played by the moderator, who, as in the case of in-depth individual interviews, should create an appropriate atmosphere. Furthermore, in the case of a group, it is important that the whole group participates in the discussion or problem-solving and not just a few individuals in the group. Therefore, the task of the moderator conducting the focus group interview is to stimulate the whole group. The moderator uses a scenario, as in the case of individual interviews. Here, however, the scenario acts as a kind of starting point for discussion, a kind of inspiration. Due to the possibility of the interview going in different directions, the moderator has to react to the statements of the interviewees on an ongoing basis. Unforeseen events may always occur, which, in the case of people participating in discussions, especially when they are people with different views and ways of thinking, are very likely to occur.[69]

Both the focus group interview and the individual in-depth interview have their advantages and disadvantages. In the case of the focus group interview,

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68 Kruczkowska P.: Raport z przebiegu sesji fokusowych z udziałem uczestników praktyk, Raport współfinansowany ze środków Unii Europejskiej w ramach Europejskiego Funduszu Społecznego (Priorytet III. Wysoka jakość systemu oświaty, Działanie 3.4. Otwartość systemu edukacji w kontekście uczenia się przez całe życie, Poddziałanie 3.4.3. Upowszechnienie uczenia się przez całe życie – projekty konkursowe). https://zasobyip2.ore.edu.pl/pl/publications/download/7963 [access: 2.07.2023]

69 Nicińska, M.: Indywidualne wywiady pogłębione i zogniskowane wywiady grupowe – analiza porównawcza, ASK, 2000, nr 8, https://kb.osu.edu/bitstream/handle/1811/69503/ASK_2000_39_50.pdf [access: 28.06.2023]

the advantage is undoubtedly research context, including views, behaviors, and problem-solving approaches, emerges organically among the group. This way of conducting research also allows to create conditions for stimulating the creativity of respondents. For instance, when solving tasks during an interview, such as performing a specific operation on the surveyed website, the brainstorming that may occur among the group may contribute to the improvement of the product. In the case of a group interview, there is a greater chance of obtaining a significant amount from the entire group. It is possible to find out the opinions and obtain an evaluation of the product from a larger number of people. Analysis material is directly gleaned from a representative group, not like in the case of an individual interview, where opinions are obtained from individuals and only aggregated after a series of surveys. Hence, the time required to conduct the survey itself and also to process the results is minimised. Individual in-depth interviews offer the advantage of gathering detailed information from the interviewee without the interference and influence that a group of respondents may have. It also allows problems to be discussed individually and the product to be tested in the way that potential users will use it.

However, both methods have some disadvantages. In the case of the focus group interview, it may be that individuals are less able to concentrate on the task at hand. Group dynamics can sometimes distract members, detracting from focused problem-solving. In the case of a group solving a problem together, the task they have been given to complete results in limited individual choices of specific solution paths. Often, solutions favored by the majority are selected, or which is considered right by the majority of the group. This approach may overlook unique solution paths where target users might encounter undetected errors. Individual in-depth interviews often exhibit lower levels of creativity, which is explained by the fact that the respondents receive less stimulus from outside than in the case of a group conversation and activities. Occasionally, a single comment can spark an ingenious solution from another participant. The focus group interview, in "contrast to individual interviews, is based on the assumption that respondents do not always have clearly defined views on the issues under investigation and, moreover, that these views do not always crystallise in isolation, independently of the opinions expressed by other people.

Hence, respondents take part in a group survey while having the opportunity to express their views and listen to the opinions of others." [70]

The disadvantage of individual interviews is certainly also the long time taken to conduct the survey. While both a group survey and an individual interview may take approximately two hours, the collection of research material is generally quicker in focus groups compared to individual interviews.

Both methods are used in research, but applied in different situations, tailored to the specific outcomes desired by the researcher. Researchers opt for focus group interviews to glean aggregated information, individual interviews when information about individual experiences is needed. Focus groups are effective for quickly obtaining results, and in the research itself we count on the creativity of the respondents, which results in checking whether the product meets expectations, but also allows us to obtain clues for possible improvements. Conversely, individual interviews eliminate group influence, and the product test is carried out on the user, who is left alone with the product, like a normal consumer, without the help of the group.

User testing is different from focus groups. Focus groups are not an appropriate way to evaluate the usability of a project. Focus groups, commonly utilized in market research, involve assembling a group for product testing. However, in order to evaluate the interactivity of a design, it is necessary to listen attentively to the actions performed by individual users while performing tasks via the user interface. While it's crucial to listen to participants' comments, in focus groups, this can sometimes lead to confusion. In user testing, the primary focus is on observing the specific actions users take while performing tasks.

Qualitative research can be used when analysing the usability of website functionality. Determining the optimal timing for website design testing is crucial. Certainly, a good moment to conduct tests is the launch of a new type of website. The results obtained during qualitative research make it possible to check and

[70] Dukaczewska-Nałęcz A., Zogniskowane wywiady grupowe – jakościowa technika badawcza [w:] Domański H. i in. (red.), Spojrzenie na metodę. Studia z metodologii badań jakościowych, IFiS PAN, Warszawa 1999, s. 150.

adapt the website to the expectations and wishes of the audience in terms of, for example, appearance, functionality, usability, customisation. It is good to test a website in this way in a situation where similar websites already exist and are frequently visited and used by users. This allows you to identify and understand the habits and motivations of users of sites that may be competing with the one being introduced. Research is often conducted to inform changes to an existing site. Users are often used to the design of the site. They are familiar with it and are able to use it efficiently. The changes made should be tested. If, contrary to the creators' intentions, the new site design discourages users, it is good to have this information before it is made public.

Site testing

S.Krug's books contain several important truths that anyone developing or researching websites should bear in mind. Undoubtedly the most important of these is that if you want to create a good site, you should certainly test it. Website designers and developers spend many hours working on a site and know exactly where they are placed and how to use all the interactions available on the site. They know the site so well that they don't imagine that someone seeing it for the first time may find it difficult to perform a few simple tasks. Every user has unique habits, ways of thinking, and approaches to interacting with websites. Users may look for the same options available on the site in different places. In addition, each page tested even by a single user can already yield a lot of information. Testing always allows designers to verify their ideas about the site and to adapt it to the expectations of the audience or simply to correct errors noticed by the tester.

One of the most important things is also that testing should be started in the early stages of work on the site. Conducting smaller, regular tests during the site's development is likely to yield better results than a single, extensive test conducted just before its public release. The answer to why this is the case is simple. In the initial phase of a project, it is even possible to completely change the original concept. In the ready-to-run product phase, a complete overhaul of the concept becomes impractical. The information that the finished product does not meet the expectations of the users and actually should not be launched

comes too late in this situation and sometimes it is easier and cheaper to make a new design than to make adjustments.

It is not technically difficult to make changes and improvements to sites that are already operating successfully. Making changes to a functioning site can be difficult due to user habits and their resistance to change, for whom changes, even necessary and in the long run beneficial, cause them to change their habits, and this may generate their opposition to the changes. Hence, it is much more advantageous, also from the users' perspective, to remove product defects before launch than to carry out operations on a functioning site.

During testing, it seems logical that tasks are performed by a group that is representative of the target group. However, it is also important that the site is tested as often as possible, and as early as possible. This approach helps to identify and rectify errors early in the site's development. Interactions with testers can provide valuable insights. It is possible that the designers have not planned something that the testers can suggest while performing the set operations on the site. The testing process itself should be cyclical; one test will not produce a properly working, usable and functional site. Thanks to testing, the people developing the site have information at various stages of production about problems with the use of aspects like the site's information architecture, search system, navigation, and any problematic or unclear mechanisms highlighted by testers.

The tests themselves should not involve too many users, three or four are sufficient. Figure 12 shows Krug's rule of thumb for the number of users and the effects of the tests obtained.

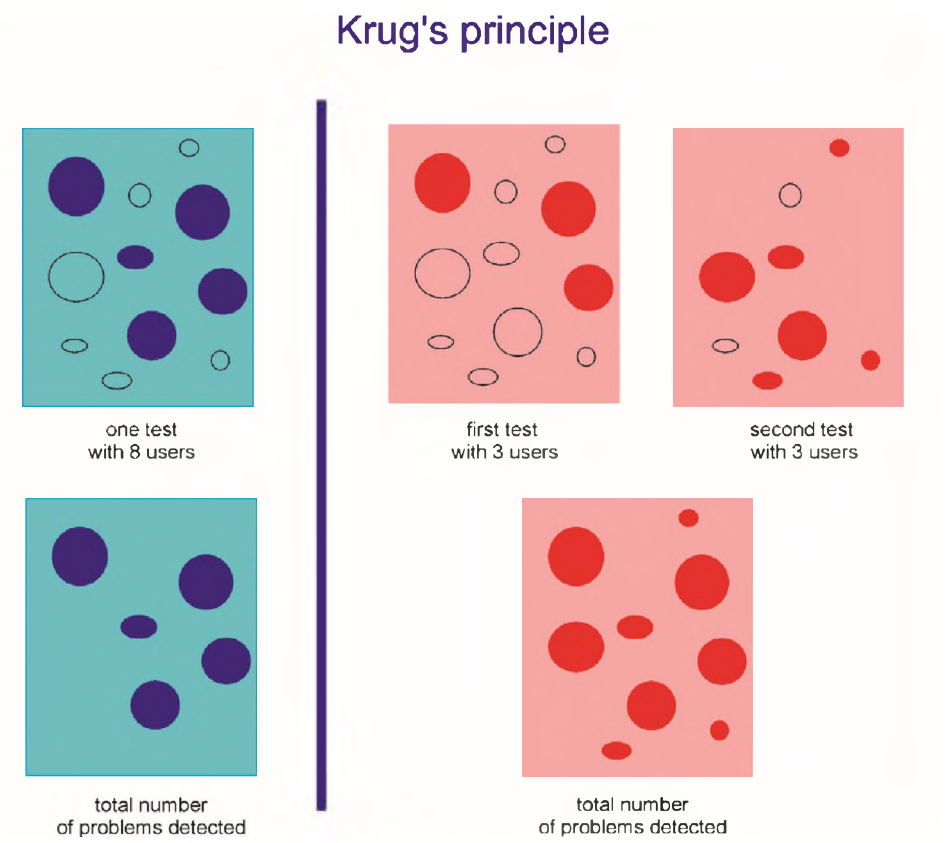

Figure 12. Krug principle

Source: compiled from: Krug, S.Nie każ mi myśleć! O życiowym podejściu do funkcjonalności stron internetowych, Helion, 2006, Gliwice

According to Krug's principle, the first three users are able to discover most usability problems. This also confirms the importance of cyclic testing. A small number of test persons makes it easy to organise tests, which can take place more frequently, after each amendment the collected test material is smaller and thus easier and quicker to analyse. Additionally, with fewer users, the post-improvement analysis can more effectively identify remaining issues until all the difficulties in using the site have been removed in subsequent cycles.

Similarly, J. Nielsen believes that 'some people think usability is very expensive and complex, and that user testing should be reserved for the rare web design

project with a huge budget and a rich schedule. Not true. Thorough usability testing is a waste of resources. The best results come from testing no more than five users and running as many small tests as you can afford."[71]

In the usability tests carried out with J. Nielsen and T. Landauer, it follows that the number of problems that are detected in a usability test conducted with n test persons can be described by the formula:

Where N denotes the total number of usability problems in the project under study, L in turn denotes the percentage of usability problems detected during the execution of the tests by a single user, while n specifies the number of people taking part in the test. According to this research, the value of L was determined. This value, averaging approximately 31%, is derived from a wide array of projects assessed in these tests. Figure 24 shows the plotted curve for L=31%.[72]

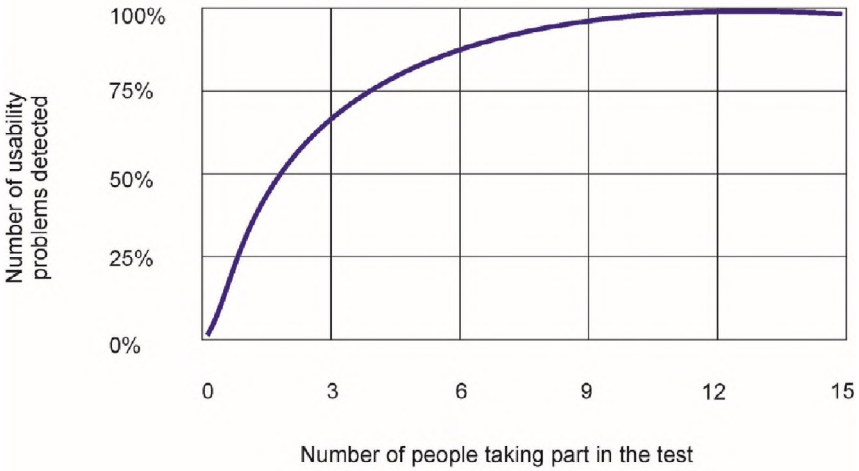

Figure 13. Dependence of detected errors on number of users[73]

Source. Based on: Nielssen, J.. WhyYouOnlyNeed to Test with 5 Users https.//www.nngroup.com/articles/how-to-conduct-a-heuristic-evaluation/

[71] J.:WhyYouOnlyNeed to Test with 5 Users, https://www.nngroup.com/articles/why-you-only-need-to-test-with-5-users/ [access: 15.07.2023]

[72] Ibid.

[73] Nielsen, J.:WhyYouOnlyNeed to Test with 5 Users, https://www.nngroup.com/articles/why-you-only-need-to-test-with-5-users/ [access: 15.07.2023]

Usability heuristics for user interface design

The web design guidelines developed by J. Nielsen are well known. These are general principles that should be followed when designing a user interface in such a way that it is usable.

Figure 14. Jacob Nielsen's 10 heuristics

The first heuristic is that the system's status should be clearly displayed. This means informing users of their current position in the process at the moment and the remaining required actions. Users should be precisely informed about the number of completed activities and those still required to achieve the desired goal. Users generally prefer to control their activities, so visualising the path of the process and showing the stage they are at gives them a sense of control and security[74].

Examples of systems that are encountered on a daily basis that provide such status information include buying a ticket to a museum or cinema or making a reservation at a cultural institution.

Another heuristic concerns the compatibility between the system and reality. This means that you should describe reality on a website using the language of the users. The language should be understandable for the audience. The language employed should be accessible and comprehensible to the target audience, avoiding phrases, concepts, and expressions that might confuse users. When designing websites, it is hard to resist the assumption that if the designer knows and understands what can be hidden under the terms placed on the page, buttons, windows, then the user will also understand it. Unfortunately, this is not always the case.

Another heuristic emphasises providing users with complete control over their actions on the site. Regardless of their navigational path in seeking information, users should always have the option to reverse their actions or a clearly marked alternative way of exiting a site.

The fourth heuristic relates to standards for developing applications or websites. When developing a user interface, it is advisable to align your solutions with current standards. However, not everything is strictly defined in them. In practice, standards cannot define all things about a website. Numerous elements and interactions are contingent upon the site's specific characteristics. When designing, it is important to take into account the mindset, usage and habits of users so that the success rate of the operations performed by the audience is at a high level[75].

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74 Nielsen, J.: Visibility of System Status, https://www.nngroup.com/articles/visibility-system-status/ [access: 18.07.2023]

75 Nielsen, J.: Do Interface StandardsStifle Design Creativity?, https://www.nngroup.com/articles/do-interface-standards-stifle-design-creativity/ [access: 12.07.2023]

Error prevention is a key recommendation in website design. Users should receive clear and comprehensible instructions on the necessary steps to achieve their goal. User errors are not always the result of users being distracted or having poorly defined goals. Sometimes, these errors stem from designers placing unclear content on the page. These are common mistakes made by those creating the site. Placing text that leaves room for users to interpret the next steps certainly does not make it any easier for those using the site's functions to avoid mistakes. A website, system, or application should always be designed to minimize user errors[76].

When navigating the site, the user should not have to think long about which option to choose. The menu should be intuitive. Users should have clear options to choose their subsequent actions when engaging with the site. Moreover, the user should be able to enter the data needed in the user process only once, while in subsequent steps he or she should be able to obtain hints based on them. The correct hints should appear progressively at each step of the action, relieving the users' memory. This is the case with log-in systems, product prompts when making purchases. Nielsen's sixth heuristic advocates for enabling choice without burdening users with memory tasks.

All systems, particularly websites, must offer both flexibility and efficiency to their users. Users typically access a site with a specific objective in mind. "They want specific information about the company, its employees, standards, services or products. Some users may prefer comprehensive and detailed articles. For others, a concise list that organises the whole thing in a clear way. Still others prefer an infographic or slideshow."[77]

When designing, mechanisms to expedite user interaction with the site should be implemented. This can be done, for example, by allowing the site to be customised.

Websites should balance aesthetic appeal with a minimalist design. This will make them more readable. Placing unnecessary information or additional dialogues in interactions causes a delay and reduces the visibility of the relevant information.

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76 Słowik, Sz: Heurystyki UX a treść strony lub sklepu internetowego, https://takaoto.pro/heurystyki-ux-przy-tworzeniu-tekstow/. [access: 11.07.2023]

77 Ibid.

Effective error handling is essential for every website. "The worst error messages are those that don't exist. When users make mistakes and receive no feedback, they are completely lost. Email, for example, offers several situations where a clear indication of the error would be useful. Such as: when you send a message that gets lost by the system and never reaches the recipient. Another good example? When you state in an email that you are attaching an attachment but forget to do so. Finally, a task for that annoying message: It looks like you want to attach a file to this message, but you didn't. Would you like to attach it now?"[78]

The user should not be left on their own because they will not use the service in question again. Error messages that may occur should be clear. The language used in error messages should be straightforward and simple. Each error message should include a description of the error and how to resolve it. The error itself should be described in a way that the user can understand. It should not consist only of an error code that tells the user nothing. Furthermore, relying solely on color indicators for errors (e.g., in a form field) is not advisable, particularly for accessibility considerations, as visually impaired users may not perceive such notifications.

When designing sites, it is also important to remember to provide adequate documentation where the user will be able to find the required information. Although some systems may operate without detailed documentation, assistance should be available, such as a user manual, where the user can find a concise and simple solution to problems related to the tasks performed.

Eyetracking research

Another way of examining websites is eye tracking. It involves tracking the movement of the subject's eyeballs. The duration of the eye's focus on each point is measured as well. This enables the determination of, for example, how information is searched for on a page, which areas of the screen have the highest level of attention, or the order in which elements are viewed on a page.

78 Nielsen, J.: Error Message Guidelines, https://www.nngroup.com/articles/error-message-guidelines/. [access: 10.07.2023]

This way of carrying out research into the usability of sites has its justification. The way of seeing needs to be considered for this purpose. The back surface of the eye consists of light-sensitive cells (photoreceptors) that convert light into electrical signals for transmission to the brain using the optic nerve. These cells are known as the retina. When looking at an object, there is a process whereby light reflects off the object. It then projects an image of the object onto the retina. Such an image in encoded form is processed by the brain. However, due to the uneven distribution of photoreceptors in the retina, visual acuity depends on which part of the retina the object falls on[79].

> "It is through eye movements that we can focus images of the objects we want to see accurately. In other words, we position our eyes in such a way that the image of the objects of interest, the objects, are located in the area of the retina with high image resolution, i.e. the central fovea."[80]

In this situation, it is possible to see the greatest amount of detail. The focus points of the gaze are termed fixations, and the involuntary eye movements that allow us to focus on the places in the image that we want to draw attention to are called cascades, otherwise known as jumping movements.

The brain-eye hypothesis is closely related to eye tracking. According to it, people tend to think about what they are looking at. They are not always able to understand or fully engage, but nevertheless, when searching for something, individuals typically focus their attention on their point of gaze, especially if they are focused on a particular task. Assuming that people tend to think about what they are looking at, determining where individuals direct their gaze can reveal insights into their cognitive processes. Thus, it becomes feasible to ascertain the audience's interests and the sequence in which they analyze content.

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79 Cowen, L.: Aneyemovementanalysis of web-pageusability, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.561.5859&rep=rep1&type=pdf [access: 15.07.2023]

80 Opach, T.: Zastosowanie okulografi i (techniki eye-tracking) w kartografi i, Polski Przegląd Kartograficzny, Tom 43, 2011, nr 2, s. 155–169

Technological developments provide the tools for this type of examination. The four most prevalent and widely utilized measurement methods are electrooculography, the use of contact lenses, photoculography and reflex oculography. Electrooculography was used in the 1970s and involved recording the position of the eyeballs relative to the head using the recording of the electrical potential difference around the eyes. Eye movement was also tracked using special contact lenses or rings. This technique involved measuring the eye's position relative to the head. These were accurate measurements, but due to the need to wear contact lenses with probing coils, this method was also very invasive and therefore not often used. Photoculography and wideooculography involved recording the movement of the eyeballs and measuring characteristic features of eye movement, e.g. changes in corneal shape. The most popular and currently used method is reflectance oculography, where the reflection of light from the eye is digitally analyzed in real time to identify the viewed areas on an image[81].

Recordings of eye movements constitute raw quantitative data requiring analysis. Contemporary eye tracking measurement equipment enables immediate data visualisation. The data obtained in this way make it possible to identify the points of the examinee's gaze, to determine the time spent looking at these points, and also to determine the path between successive points of interest of the examined person.

The findings can be presented in various forms, such as heat maps, fixation maps, or areas of interest[82]. The heat map allows the subjects' gaze concentration on individual points in the image to be depicted as coloured spots. In heat maps, areas of longest gaze concentration are coloured red. At the points where the subjects' gaze was concentrated for a shorter time, yellow spots appear. Places of even shorter concentration are marked in green, while places that did not attract the users' attention remain unpigmented. A special case of the heat map is the inverted heat map. Here, in contrast to the previously described map, there are

81 Ibid

82 Garczarek-Bąk, U: Użyteczność badań eyetrackignowych w pomiarze utajonych determinant zachowań zakupowych nabywców, Econometria 3(53), 2016, http://www.dbc.wroc.pl/Content/36365/Garczarek-Bak_Uzytecznosc_Badan_Eye_Trackingowych_w_Pomiarze_2016.pdf [access: 10.07.2023]

no coloured markings for areas of visual focus. Only the areas that the subject looked at are visible in the image, the more clearly exposed the longer the user's gaze was focused on a particular spot. In contrast, other areas are obscured.

The fixation map, also known as the gaze path, illustrates the sequence of gaze movements over the examined image. Areas of gaze concentration are marked with circles. The size of the circle's diameter depends on the amount of time the subject spends looking at the area. Each circle has a number, which indicates the order in which the focus points occurred while the user was looking at the image. The circles are connected by lines, symbolising cascade movements. This type of analysis also facilitates the assessment of points that may distract from the main content on, for instance, a webpage[83].

Another way to visualise the data in this type of research is to analyse areas of interest. This approach specifies areas based on the total gaze count, by recording the percentage distribution of attention, often represented as rectangles, into which the surveyed image is divided. The division and shape of these areas of interest are determined by the researcher designing the study. The operation is similar to heat maps. The difference lies in the ability to directly analyse the number of gazes in a given area – the data on the number of gazes is visible directly on the image. In the case of a heat map, we can see areas of lower and higher concentration in the form of spots, without numerical values.

Clicktracking

Click tracking is, like eye tracking, a method of tracking what a user does on a website. The difference is that, in this case, mouse clicks made by the user while visiting a particular website are recorded. This method observes both the location and frequency of clicks. Hence, attention is focused on clicks on links, including clicks that do not result in any action. On this basis, as in the previous method, a heat map is created. On the map, sites that are of high interest to users are marked – these are known as hot spots – and sites that are bypassed by users, known as cold spots.

[83] Ibid.

Click tracking enables the identification of website elements that engage users and those that are disregarded. From this, it is possible to deduce where the information and interactions that site designers would like to reach their audience should be located. In the hot areas, it is a good idea to place the most important information, in line with the purpose of the site. Post-analysis, areas with minimal interaction, or 'cold spots', should be re-evaluated or eliminated. Information about where recipients click is also information about where their attention is focused, and in such places, web designers usually place, for example, advertisements or other elements to which they want to redirect the attention of internet users. Various click tracking tools are available, such as ClickDensity, CrazyEgg and EasyLabs.

When to conduct research?

Usability is very important during each stage of the design process. Initial testing is most effective when conducted before commencing the design process. Competing sites, or sites of a similar nature to the one to be designed, are tested in this case. In this case, it is possible to check how users navigate existing sites, enabling the adoption of effective solutions and the avoidance of errors. With early testing, it is possible to check user preferences related to the interface.

In the early design phase, it is possible to verify the correctness of design assumptions. At this stage, creating and evaluating paper prototypes of the planned solutions is beneficial. Testing such a version on a few users will help steer further activities in the right direction.

Refining design ideas through multiple iterations is key, progressing from low-fidelity to high-fidelity prototypes that works on the computer. It is useful to test each iteration. Designs in development must be evaluated against established usability guidelines, whether these guidelines are derived from previous in-house research or publicly available published research.

Testing should occur even after the final design has been selected and implemented. Minor usability issues always arise during implementation, so user testing should not be delayed until you have a fully implemented design. Delayed testing may render many critical usability issues irreparable that can be detected during testing conducted at earlier stages. This is because these problems may be structural

in nature, making them very difficult to fix, or no longer cost-effective to fix at the implementation stage.

Achieving a high-quality user experience necessitates is to start user testing early in the design process and continue testing at each stage[84].

5.1.6. *Website functions*

Websites are designed for a specific purpose. They should fulfil a given function. Websites can generally be categorized based on the following functions: informational, marketing (advertising), contact (communication), social, booking, payment, personalisation and educational.

The primary function of any website is informational. Irrespective of the industry, their primary role is to disseminate information.

Websites also have a marketing function. Their role includes promoting product offers and advertising products. Websites have a contact function. This encompasses providing contact information and facilitating communication between customers and service providers. Additionally, websites may feature special forms for sending messages, circumventing the need for email communication.

Website can incorporate a payment function, allowing for online transactions through specific modules. Websites may have a personalisation function. This allows users to register on the site and also to receive automatic information from the site.

Websites can also have an educational function. This function can be realised through information about educational events, courses, in the form of a blog containing instructions, descriptions, or using distance learning methods and techniques.

In the beauty industry, websites typically serve informational, commercial, and booking functions.

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84 Nielsen, J: WhyYouOnlyNeed to Test with 5 Users https://www.nngroup.com/articles/usability-101-introduction-to-usability/ [access: 12.06.2023]

6. UNIVERSAL DESIGN MATURITY ASSESSMENT MODEL

Evaluating a company's capability to serve both individuals without and with limitations requires the creation of an appropriate model. This model enables companies to assess their current stage of development in terms of universal design. Additionally, it facilitates the identification of necessary steps for a company to advance to the next level of inclusive service provision. This endeavour entails developing a model with comprehensive guidelines relating to each level of advancement. Subsequent stages of research will analyse the needs and achievable levels in the model for the industry. This will make the model, ultimately, applicable to any industry. Only the values of the levels possible and needed in an industry will remain to be determined.

The universal design/accessibility maturity model encompasses four domains: management, architecture, related to on-site services and in terms of digital services. This last area requires recalling the definition of accessibility of web services and mobile applications. Web accessibility ensures that a website is usable by everyone, encompassing individuals with disabilities or various impairments, regardless of the limitations of their computer equipment[85].

A poorly designed website may be inaccessible not just to people with disabilities. A user who does not have a loudspeaker on his or her computer will not be able to listen to an audio file, and an Internet user who has lost his or her mouse may not be able to navigate a website that is not adapted for use with a keyboard. In such a case, there is no way to use the service. Not being aware of this can lead to the loss of a customer, but also, in the case of an administration, to not being able to provide important services (which is acute for people with various limitations including in the case of migratory and epidemiological risks).

[85] Zdonek D., Spałek S., *Metody oceny dostępności stron internetowych i problemy związane z ich wiarygodnością w: Zeszyty Naukowe Politechniki Śląskiej, Organizacja i zarządzanie*, z. 64, 2013

The maturity model will encompass issues pertaining to sensory design, multi-modal communication, wayfinding, alternative text placement, transcription, tiflography, user experience, and more. Sensory design addresses experiences associated with the human senses, including sight, hearing, taste, smell, and touch. It also includes design related to human sensations when confronted with a product or object: touch, texture, friction, visual colour, brightness, shape, pattern, sounds and movements, smell, taste, temperature and perceived thermal properties. Multi-modal communication involves the integration and complementarity of information transmitted across various modalities. Synchronisation is necessary here between what users say, how they gesture or what they do and what they see, hear and touch. This, in turn, translates into fewer errors due to the duplication of channels for conveying a given piece of information[86].

Tiffographics, on the other hand, are graphics for the blind and visually impaired:

1. is a graphic representation and representation of reality, using scale, proportion and generalisation, in a way that is tactilely accessible to blind people,
2. is a graphic representation and representation of reality, using scale, proportion and generalisation, that is visually accessible to people with limited visual perception,
3. is a graphic representation and representation of reality, using scale, proportion and generalisation, that is accessible by touch and sight to blind people and those with limited visual perception[87].

The term 'wayfinding system' refers to information systems guiding individuals through physical environments, thereby enhancing their spatial understanding and experience. Wayfinding is the purposeful interaction with the environment to get to a place[88].

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86 Mikołajewska, E., Mikołajewski, D: Komunikacja dla osób niepełnosprawnych w środowiskach nowych mediów; Lingua ac Communitas, ISSN 1230-3143, Vol. 22, 2012

87 Talukder, A: „Życie dziecka bez obrazków", Tyfloświat nr 1/2010

88 Golledge, Reginald G. Wayfinding Behavior: Cognitive Mapping and Other Spatial Processes.Baltimore: Johns Hopkins UP, 1999

As previously mentioned, this paper will detail the digital universal design maturity model. It will consider the needs of individuals with disabilities as well as those with temporary limitations, among others.

6.1. Areas of the universal design maturity model

"Maturity models are typically developed by either modifying and enhancing an existing reference model or through a design process initiated from scratch. The reference model for building domain models can be any generic model – such as CMMI or BPMM for process improvement, for example. Based on such a model, more specific models tailored to the unique aspects of a particular industry can be developed or that improve a selected area of the company's operations."[89]

The universal design model will be formulated as a domain model, grounded in the principles of the CMMI model. The maturity model design methodology by T. de Bruin, M. Rosemann, R. Freeze and U. Kulkarni[90].

This approach delineates six stages in the maturity model design process. These stages include:

- defining the scope of the model
- design
- filling in the model with knowledge
- testing
- application
- maintaining the model.

[89] Głuszek E., Kacała A., Metodologiczne podstawy projektowania modeli dojrzałości, „Nauki o Zarządzaniu – Management Sciences" 2015", nr 2 (23)

[90] de Bruin T., Rosemann M., Freeze R., Kulkarni U., 2005, Understanding the Main Phases of Developing a Maturity Assessment Model, 16th Australian Conference on Information Systems, Sydney, https://www.researchgate.net/publication/27482282_Understanding_the_Main_Phases_of_Developing_a_Maturity_Assessment_Model [access: 20.07.2023]

According to these assumptions, the model will have five maturity levels (Figure 15). This publication will focus on describing the first three stages of the universal design maturity model's design process.

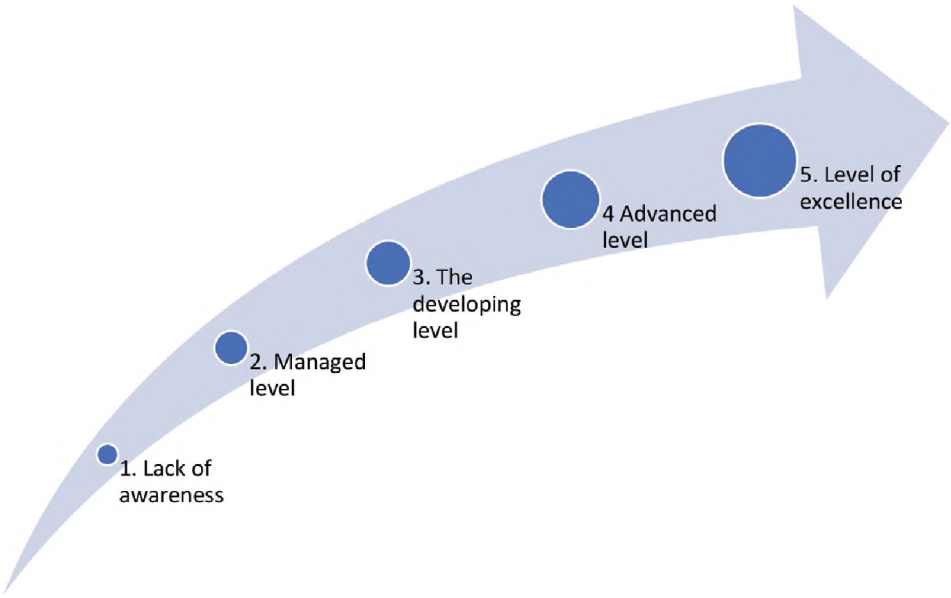

Figure 15. Maturity levels of universal design

For the universal design maturity model, 5 levels can be specified:

1. Lack of awareness/beginner level:
2. Managed level:
3. Developing level/defined level:
4. Advanced/quantitative level:
5. Level of excellence/optimising:

The model will encompass four distinct areas. Objectives and practices can be defined for each category within these areas. This is illustrated in Figure 16. For each company, it will be possible to define the gaps in each area, identify the level the company is currently at and define the level the company wants or needs to reach.

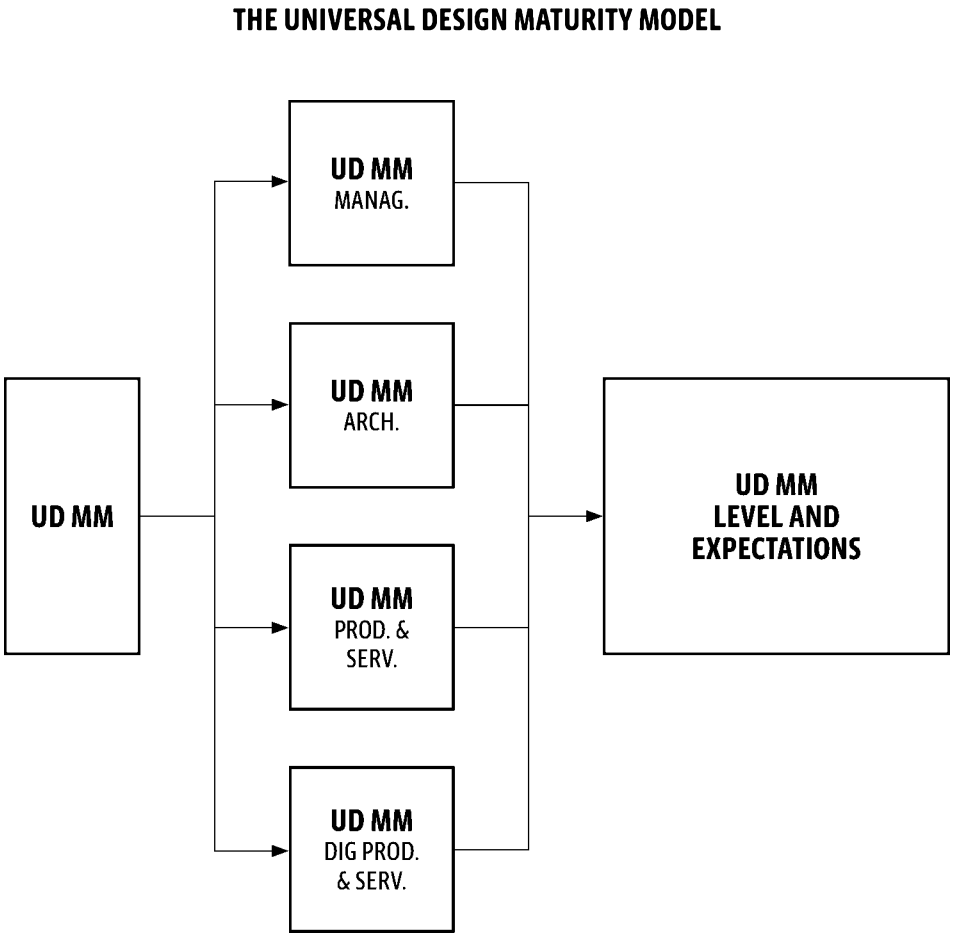

Figure 16. The universal design maturity model

At Level 1, the organisation lacks awareness of universal design principles. There is a lack of understanding of the need to consider user diversity in the design process.

Level 1 characteristics:

- Lack of Knowledge of Universal Design.
- The organisation is not aware of the principles of universal design.
- No training or information on accessibility.
- Lack of Resources to Support Accessibility.

- No teams or resources focused on accessibility issues.
- Neglecting aspects of Accessibility.
- Lack of implementation of accessibility standards and procedures.
- No projects involving the implementation of a new product or service are assessed for accessibility.
- Lack of Strategy in the Market.
- The company does not consider strategies related to meeting the needs of diverse user groups.
- No analysis of competition in terms of accessibility.

Objectives:

- Creating Consciousness:
  - » The aim is to build a basic awareness within the organisation about universal design.
  - » The organisation should understand why considering user diversity in design is important.
- Starting the Education Process:
  - » The objective includes starting to educate staff on the basics of universal design.
  - » The organisation should initiate the first steps in providing learning resources for project teams.

Practices:

- Knowledge Gap Analysis:
  - » Carry out an analysis to identify areas of lack of knowledge about universal design.
  - » Identify areas that need the most attention and education.
- Preliminary Education Meetings:
  - » Organise initial educational meetings to discuss basic concepts related to design for a variety of user groups.
  - » To initiate a discussion on the importance of accessibility.
- Defining Lines of Action:
  - » Identify future directions for considering accessibility in the design process.
  - » Establishing the first stages of introducing universal design practices.

- Initiating a Competitive Analysis:
  - » Carry out a preliminary analysis of competitors in terms of accessibility.
  - » Identify whether and how competitors take into account user diversity.
- Establishing Initial Roles:
  - » Assigning initial roles and responsibilities related to universal design in the organisation.
  - » Identify individuals who can become leaders in the area.

This level provides a starting point from which the organisation can build awareness and understanding of the importance of universal design. The next levels will focus on the gradual implementation of accessibility practices and principles.

At level 2, the organisation cultivates an awareness of universal design principles and initiates their implementation. At this initial stage, a primary objective is understanding the necessity of adapting designs to user diversity.

Level 2 characteristics:

- Accessibility Awareness:
  - » The organisation is aware of the existence of accessibility rules and standards.
  - » Initial steps in understanding the diversity of user needs.
- Basic Training:
  - » Introductory training for staff in universal design fundamentals.
  - » Initial understanding of the benefits of accessibility.
- Pilot Projects:
  - » Initiation of pilot projects to implement universal design principles.
  - » Monitoring and documentation of initial experiments.
- Assignment of Responsibility:
  - » Designation of individuals or teams responsible for overseeing accessibility in projects.
  - » Development of initial accessibility protocols.

- Risk Awareness:
  - » Recognition of potential risks stemming from insufficient accessibility.
  - » An initial approach to minimising these risks.
- Market Research:
  - » Preliminary market research focused on customer expectations regarding accessibility.
  - » Understanding competition in the context of universal design.

Objectives:

- Employee Involvement in Accessibility:
  - » The aim is to increase staff involvement in accessibility and universal design.
  - » The organisation should strive to ensure that project teams are aware of the need to consider user diversity.
- Introducing the Fundamental Practices of Universal Design:
  - » The objective includes introducing basic universal design practices within projects.
  - » The organisation should aim to consider accessibility in the design phase.

Practices:

- Integration of Training in the Area of Accessibility:
  - » Begin integrating accessibility training into the staff training programme.
  - » The organisation should provide basic information on universal design.
- Commencement of Accessibility Standard Setting:
  - » Begin the process of setting baseline standards for accessibility in projects.
  - » Definition of minimum accessibility requirements.
- Pilot Projects with Universal Elements:
  - » Selection of first projects in which the basic principles of universal design are implemented.
  - » Monitoring and documentation of initial experiments.

- Basic User Research with Consideration to Accessibility:
  - » Carry out basic user research taking into account the diversity of groups.
  - » Obtaining initial data on the specific needs of different users.
- Monitoring Project Outcomes in the Context of Accessibility:
  - » Start monitoring project results for accessibility.
  - » Introduce a retrospective process to evaluate accessibility measures.

This level is the starting point that lays the foundation for the organisation's further development in the area of universal design. As the organisation progresses at this level, it will be able to move to more advanced stages, consistently improving its ability to design for diverse user groups.

At Level 3, the organisation has taken its first concrete steps in accessibility and universal design. It is beginning to understand the importance of considering user diversity in the design process.

Characteristics:

- Extending the Knowledge of Universal Design:
  - » The organisation is providing the first training on the principles of universal design.
  - » Increase staff awareness of different aspects of accessibility.
- Creating Accessibility Teams:
  - » Establish teams responsible for accessibility issues in projects.
  - » Assigning the role of accessibility specialists.
- Implementation of Accessibility Standards:
  - » Introduction of basic accessibility standards and procedures.
  - » Monitoring their application in projects.
- Accessibility Testing in Projects:
  - » Initial attempts at accessibility testing within projects.
  - » Analysing the results and adjusting projects based on the information obtained.

- Introducing Accessibility Requirements in Design Briefs:
  - » Entry of accessibility requirements into project briefs.
  - » Ensuring that each project incorporates aspects of design for diverse user groups.

Objectives:

- Strengthening the Understanding of Accessibility:
  - » The aim at Level 2 is to strengthen the understanding of the essence of accessibility in design.
  - » The organisation should prioritise building a deeper awareness of the diversity of user needs.
- Developing the Skills of Project Teams:
  - » The objective includes developing the project teams' skills in accessibility and universal design.
  - » The organisation aims to increase the teams' knowledge of accessibility tools and techniques.

Practices:

- Extension of Training in the Area of Accessibility:
  - » Expand the training programme to include more advanced accessibility topics.
  - » Introduce practical, solution-oriented training for specific cases.
- Implementation of Accessibility Assessment Processes:
  - » Implement accessibility assessment processes for projects.
  - » Regular review of projects for compliance with designated accessibility standards.
- In-depth User Surveys with Consideration of Accessibility:
  - » Conducting more advanced user research, focusing on the diversity of groups and more specific needs.
  - » Using the data obtained to improve projects.
- Introduction of Accessibility Teams:
  - » Introduction of dedicated teams to deal with accessibility aspects of projects.
  - » Establishing specialised roles within project teams related to accessibility.

- Continued Monitoring of Project Outcomes in the Accessibility Context:
  - » Continue to monitor project results for accessibility.
  - » Evolving the retrospective process to assess accessibility measures more effectively.

Level 3 is the stage where the organisation intensifies its universal design activities. It lays the foundations for further development, gaining experience in implementing accessibility practices in projects.

At Level 4, the organisation develops more advanced accessibility practices, integrating them more deeply into all phases of the design process.

Characteristics:

- Advanced Employee Training:
  - » Providing advanced training for staff on universal design.
  - » Participation in specialised courses on accessibility.
- Full Involvement of Accessibility Teams:
  - » Accessibility teams are full participants in all stages of projects.
  - » Accessibility specialists are actively involved in design decisions.
- Developed Accessibility Standards:
  - » Implementation of more advanced accessibility standards.
  - » Introduce procedures to monitor compliance with these standards.
- Automation of Accessibility Testing:
  - » Use of automated accessibility testing tools.
  - » Continuous monitoring of the quality of accessibility using these tools.
- Comprehensive User Research:
  - » Extend user research to different groups, taking into account different aspects of accessibility.
  - » Obtaining regular feedback from diverse users.
- Accessibility as a Criterion for Project Success:
  - » Introduce accessibility as one of the main criteria for project success.
  - » The client also assesses projects in terms of accessibility.

Objectives:

- Shaping a Culture of Accessibility:
  - » The aim is to shape an organisational culture in which accessibility becomes an integral value.
  - » The organisation aims to embed the principles of universal design in everyday practices.
  - » The organisation is committed to continuous development in terms of accessibility tools, techniques and trends.
  - » Implementation of advanced accessibility monitoring tools and procedures.
  - » Accessibility is becoming an integral part of organisational culture.
- Improving the Skills of Project Teams:
  - » The objective includes improving the skills of project teams in the areas of accessibility and universal design.
  - » Full understanding and involvement of project teams in accessibility issues.

Practices:

- Integrating Accessibility into the Design Process:
  - » Integration of accessibility principles in all stages of the design process, from planning to implementation.
  - » Introduce the 'accessibility by design' approach as a standard.
- Expanding Training to include Aspects of Organisational Culture:
  - » Expand training programmes to include elements related to organisational culture.
  - » Shaping a proactive attitude towards accessibility.
- Establishment of Project Specific Accessibility Standards:
  - » Establish accessibility standards adapted to the specifics of individual projects.
  - » Determination of individual requirements depending on the project context.
- Continued Improvement of User Research:
  - » Continuation of advanced user research, taking into account the diversity of groups.
  - » Proactively use research findings for continuous project improvement.

Level 4 is the stage where the organisation gains advanced skills in universal design and integrates these practices into its daily design processes. Accessibility becomes an integral part of the design strategy, and the organisation acts with full awareness and focus on the needs of diverse users.

At Level 5, the organisation achieves a high degree of maturity in universal design, meaning that accessibility practices are integrated in a deep way in all aspects of the design process.

Characteristics:

- Excellent Culture of Accessibility:
  - » An organisational culture that favours accessibility and universal design is widespread.
  - » Accessibility values are embodied by all staff.
- Developed Research Procedures:
  - » Adopt advanced testing procedures that take into account the diversity of users.
  - » Regular, structured testing sessions with different user groups.
- Integrating Accessibility in Iterative Cycles:
  - » Accessibility is an integral part of project iteration cycles.
  - » Regular retrospective sessions including assessment of project availability.
- Continuous Optimisation of Tools and Procedures:
  - » Continuous improvement of accessibility tools and procedures.
  - » The organisation monitors new technologies and accessibility standards, adapting its approach.
- Accessibility as a differentiating element in the market:
  - » The organisation uses accessibility as a differentiating element in the market.
  - » Clients appreciate and expect designs that are accessible to different user groups.

Objectives:

- Improving Accessibility Processes:

  - » The aim is to achieve optimisation of accessibility processes.
  - » The organisation aims to continuously improve its universal design practices.
- Strengthening a Culture of Accessibility:
  - » The objective includes strengthening the organisational culture as a key element in the effectiveness of accessibility measures.
  - » The organisation is committed to fostering pro-accessibility attitudes at all levels.

Practices:

- Optimising Design Processes:
  - » Optimising design processes for accessibility.
  - » Continuous improvement of procedures and tools used in projects.
- Developed Training for Project Teams:
  - » Expand training programmes to include advanced aspects of universal design.
  - » Training covering both technical and social aspects of accessibility.
- Establishing Integrated Accessibility Standards:
  - » Establish integrated accessibility standards covering different project areas.
  - » Unification of accessibility criteria at organisation level.
- Expanding User Research to include Usability Testing:
  - » Expanding user research to include usability testing, with a focus on the experience of users with different needs.
  - » Actively use user feedback to continuously improve interfaces.
- Introducing Innovation in Accessibility:
  - » Introducing innovative accessibility solutions.
  - » Undertaking experiments and testing new technologies in the context of universal design.
- Shaping a Pro-Accessibility Culture:
  - » Shaping a pro-accessibility culture by initiating educational and social activities.
  - » Strengthening attitudes and values related to accessibility in all areas of the organisation.

Level 5 represents the highest level of maturity in the area of universal design. At Level 5, the organisation demonstrates a comprehensive commitment to ensuring accessibility for diverse user groups, and accessibility is seamlessly integrated into the business strategy.

Through an analysis aimed at determining the level of maturity, it will be possible for each company to define the gaps in each area, to determine the level at which the company currently stands and to identify the level that the company wants or needs to reach. This makes it possible to diagnose the necessary activities for the company to enhance accessibility in order to make its products and services accessible to a wide audience with different constraints.

In line with the assumptions made at the beginning of this chapter, the subsequent section will present a detailed excerpt from the organisation's maturity model relating to the company's activities in terms of the digital products and services offered. It illustrates the criteria that will be considered when analysing the availability of the companies' digitally delivered products and services.

In the beauty industry, websites serve multiple functions, including providing information, selling products, and booking salon services. There are at least three processes here: searching for information, booking a service, buying a product. For each process, most of the objectives for universal design overlap. Therefore, the objectives and practices in this case will be dissected for all processes together.

Level 1

Objectives

1. Ensuring that the performance of activities on the site is remembered at a low level by those without restrictions.
2. Ensuring that the performance of activities on the site is satisfactory at a low level by those without limitations.
3. Ensuring flawless execution of low-level site activities by unrestricted persons.

Practices

1. The user is able to carry out the given actions after a long absence from the website, but has to think about the next steps for a long time (can be assessed using qualitative techniques – user rating 1/5).
2. The user is not satisfied with the low-level operation of the website, he is able to perform actions, but it is not easy and intuitive (can be assessed using qualitative techniques – user rating 1/5).
3. The user is not supported in filling in the forms (can be assessed using qualitative techniques – user rating 1/5).

Level 2

Objectives

1. Provide textual alternatives for all non-textual information on the website.
2. Offer alternatives for time-based media.
3. Ensure text color is not the sole distinguishing feature in information presentation.
4. Ensure keyboard operability of the website.
5. Ensure flickering and shifting content is stoppable.
6. Ensure the site is free from content that flashes more than three times per second.
7. Ensure repeatable blocks on multiple pages are skippable.
8. Ensure page content is accessible to reading programs.
9. Provide clear information on errors.
10. Ensure correctness of code to facilitate programmatic supporters.
11. Ensure the website's ease of use.
12. Ensure operational efficiency of the website.
13. Ensure activities performed on the site are easily recalled by individuals with and without limitations.
14. Ensure activities on the site are satisfactorily performable by individuals with and without limitations.
15. Ensure seamless execution of basic page activities for all users, regardless of limitations.

Practices

1. Users are able to read alternative textual information if they cannot read the graphic or other information.
2. A user who cannot play or understand the audio or video content should be able to read it in a textual form that enables them to understand.
3. The user can find the highlighted – more important – information not only on the basis of a different colour.
4. The user can access the website using the basic keyboard keys: tab, arrow or other standard output methods.
5. The user can stop the flickering content to read the information freely.
6. The user is free to use the site without fear of possibly triggering epileptic seizures.
7. The user can skip blocks of repeated material, e.g. by using a reference to the home page at the top of the page.
8. The user is informed of any incorrectly entered data.
9. The user can easily use assistive technology thanks, for example, to correct tags in the code.
10. The site is easy to use for users with and without restrictions (assessable using qualitative techniques – user rating of 2/5).
11. The time taken to complete the individual steps on the website is long, despite the fact that people with and without limitations are familiar with it (can be assessed using qualitative techniques – user rating 2/5).
12. The user is able to perform the given actions after a long absence from the site, but needs to think about the next actions (assessable using qualitative techniques – user rating with and without restrictions 2/5).
13. The user is moderately satisfied with the performance of the website, the website needs improvement (assessable using qualitative techniques – user rating with and without restrictions at 2/5).
14. The user is supported in filling in the forms, is informed of errors (possibility of evaluation using qualitative techniques – user evaluation with and without limitations 2/5).

Level 3

Objectives

1. Provide extended subtitles for live multimedia content.
2. Ensure accurate interpretation of content in commands and instructions requiring sequential execution.
3. Ensure sufficient contrast and size for recorded information against the background.
4. Offer the option to disable animations triggered by interactions.
5. Ensure that headings and labels accurately reflect the content of the subpages.
6. Ensure consistent site navigation.
7. Provide labels and instructions for forms and related elements.
8. Ensuring the site is easy to use.
9. Ensuring the efficiency of the site's operations.
10. Ensure that activities on the site leave a lasting, memorable impression.
11. Ensure satisfactory performance of activities on the site.
12. Ensure impeccable execution of activities on the site.

Practices

1. Users can make use of subtitles containing spoken text content and descriptions of scenery, context, etc.
2. The user is able to understand the exact sequence of commands to be executed if a specific sequence is required.
3. Users can search the site for content by adjusting the contrast and size of the letter to their preference.
4. The user is able to switch off animations that are triggered by interactions,e.g. moving images, flashing banner.
5. The user is able to see what content is presented on the page directly from the headline or label, without reading the content itself.
6. The user uses a repetitive navigation method on each page.
7. The user is assisted during data entry by a description of what data is to be entered and its format.
8. The website is easy to use for users with and without restrictions (can be assessed using qualitative techniques – user rating of 3/5).

9. The time taken to perform the various actions to be performed on the website despite its familiarity for people with and without limitations is short, but needs improvement (can be assessed using qualitative techniques – user rating 3/5).
10. The user is able to carry out the given actions after a prolonged absence from the site with minimal hesitation during the performed operations (can be assessed using qualitative techniques – rating of users with and without restrictions 3/5).
11. The user is satisfied with the performance of the website, but the website needs improvement (can be assessed using qualitative techniques – user rating with and without restrictions at 3/5).
12. The user is supported in filling in the forms, receiving information e.g. on the type of data to be entered (possibility of evaluation using qualitative techniques – user evaluation with and without restrictions 3/5).

Level 4

Objectives

1. Ensure proper functionality of forms.
2. Ensure the option to switch off or mute background music
3. Ensure keyboard accessibility for all functionalities.
4. Ensure that user-authorised sessions can continue without data loss post-reauthorization, particularly for time-limited sessions, and provide timeout information.
5. Providing multiple routes to the content.
6. Facilitate user operation of functions through diverse means, extending beyond keyboard use.
7. Ensure clarity in the information and operation of the interface.
8. Guarantee consistent identification of interface components.
9. Provide a mechanism for prompting and auto-matching.
10. Ensure user-friendliness of the site.
11. Ensuring the efficiency of the site's operations.
12. Ensure satisfactory execution of activities on the site.
13. Ensure impeccable execution of site activities.

Practices

1. When entering data into a form, the user knows what type of data is expected.
2. The user is able to switch off or reduce the volume of background sounds so that the main content can be heard more clearly.
3. The user can easily operate the site using the keyboard.
4. A user needing more time to complete forms, in the case of a set time limit, can extend the session time.
5. The user can access the content in various ways, e.g. by returning to the home page without having to follow the same path as before.
6. The user is able to handle the functionality of the website without using the keyboard, including the ability to type text, etc.
7. The user is able to understand all the information contained on the website and all the information regarding the operation of the website itself.
8. The user has the option of using the same set of components on different subpages – looking the same on each subpage.
9. The user has the option of using prompts when entering data.
10. The website is easy to use for users with and without restrictions (assessable using qualitative techniques – user rating of 4/5).
11. Time to perform individual actions on the website despite familiarity with the website for people with and without limitations is short (assessable using qualitative techniques – user rating 4/5).
12. User is able to carry out the task after a prolonged absence from the site (can be assessed using qualitative techniques – user rating with and without restrictions 4/5).
13. The user is satisfied with the performance of the website, the website does not need any improvements (evaluable using qualitative techniques – user rating with and without restrictions at 4/5).
14. The user is supported in filling in the forms, the user is supported by automatic prompts (possibility of evaluation using qualitative techniques – user evaluation with restrictions and without restrictions 4/5).

Level 5

Objectives

1. Offer alternatives to all audio and video recordings.
2. Ensure that content is easily accessible and distinguishable from the background.
3. Allow sufficient time for users to read and interact with the content.
4. Ensure that the presentation of content does not provoke epileptic seizures.
5. Offer users tools to assist in navigation, locating content, and understanding their current position.
6. Ensure that pages open and function predictably, maintaining a consistent appearance.
7. Offer comprehensive assistance to users for the prevention and correction of errors.
8. Guarantee optimal compatibility with both existing and future user programs, encompassing assistive technologies.
9. Ensure the website's usability.
10. Ensure efficient operation of the site.
11. Ensure that activities performed on the site leave a lasting impression.
12. Ensure the satisfactory execution of activities on the site.
13. Ensure the impeccable execution of site activities.

Practices

1. The user has the option of using alternative sources of information.
2. The user is able to benefit from the facility to separate information from the audio and visual background.
3. When using the site, the user does not encounter any restrictions that may result from limited time to perform operations or display information.
4. The user can use the site without fear of encountering elements that may cause epileptic seizures.
5. Users anywhere on the site are able to search for information and know where they are thanks to the navigation tools provided.

6. The user sees a consistent presentation of the content, operation of components, navigation, etc. at every point of the site's operation.
7. The user is assisted during data maintenance through the use of mechanisms for checking, confirming data, the possibility of reversing data entry.
8. The user can make use of facilities in the site code when using technologies that support.
9. The website is easy to use for users with and without restrictions (assessable using qualitative techniques – user rating of 5/5).
10. The time taken to perform the various steps on the website, despite its familiarity for people with and without limitations, is short and does not require further refinement (can be assessed using qualitative techniques – user rating 5/5).
11. The user is able to perform the given actions after a long absence from the site, the site is intuitive, no corrections required (can be evaluated using qualitative techniques – user rating with and without restrictions 5/5).
12. The user is satisfied with the performance of the website, the website is very well developed (evaluable using qualitative techniques – user rating with and without restrictions at 5/5).
13. The user is supported when filling in forms, the user is supported with information about the type of data, the possibility to undo an operation, autocomplete, prompts, etc. (can be evaluated using qualitative techniques – user rating with and without restrictions 5/5).

Considering the aforementioned criteria for each level, it becomes feasible to assess the maturity level of universal design within the digital service sector. By analysing the individual websites of beauty salons, hairdressers, beauty shops, and similar establishments, it will be possible to determine from this the extent to which individual companies are endeavoring to accommodate their potential customers, particularly those with disabilities.

Not every company ultimately is required to attain Level 5, for digital services and products.

In the case of the beauty industry, the next step in the research, after having developed an overall universal design maturity model based on the criteria and

requirements related to the principles adopted when designing websites in terms of accessibility, functionality and usability, is to ascertain the standing of individual companies in relation to these criteria.

The results will be recorded in a website audit sheet in terms of universal design maturity. This contains all the elements described above that need to be checked so that gaps can be mapped, and it can be checked at which level the company is at.

Table 2. Web site audit sheet for universal design maturity

Name of criterion being checked	Level 1	Level 2	Level 3	Level 4	Level 5
Text alternative (for any non-textual content, convertible to other forms)					
Multimedia (alternative to time-based media).					
Adaptable (content can be presented in different ways)					
Diversity (ability to separate content from background)					
Keyboard accessibility (for all functionalities)					
Sufficient time (to read and use the content)					
Epileptic seizures (content design so as not to trigger epileptic seizures)					
Navigability (facilitation of navigation and content search)					
Operating methods (via the keyboard and alternatives)					

Name of criterion being checked	Level 1	Level 2	Level 3	Level 4	Level 5
Readability (content that can be understood and read)					
Predictability (looking and acting in a predictable way)					
Assistance with the input of information (support for avoiding the repair of errors)					
Compatibility (support for assistive technologies)					
Speed of learning (level of difficulty of individual activities)					
Efficiency (time taken for individual activities)					
Memorising (remembering how to do things after a long pause)					
Satisfaction (checking whether users, when using the site, are satisfied with performing particular activities or do so with reluctance)					
Errors (support in prevention and correction)					

The aforementioned worksheet helps to assess the maturity level of universal design for digital services. It allows you to determine what needs to be improved to elevate a website's maturity ranking within a specific criterion. The individual criteria are linked to the objectives and practices described above. During a website audit, pertinent boxes in the table are marked. This also provides a graphical representation of the current state and the level to which the company should aspire. An example is shown below to illustrate how such a sheet might look.

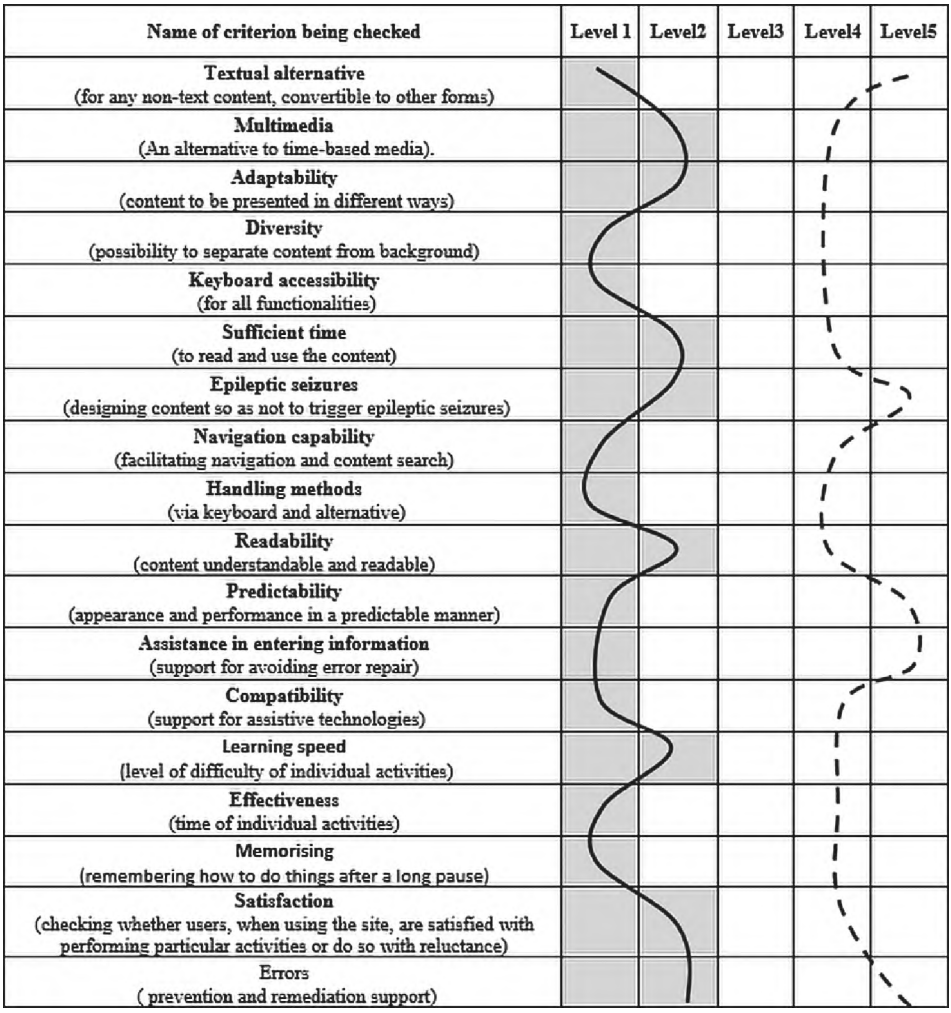

Figure 17. Example of a website audit sheet.

Legend: Solid line – current state, dashed line – example of target state for the industry.

Source: own elaboration

The next stage of the research work involves creating a model and developing assessment criteria for the other three areas. Then, for the selected industry – the fast-growing beauty industry – the possible and necessary levels of maturity will be developed.

7. SUMMARY AND DIRECTIONS FOR FURTHER RESEARCH

Amidst growing public awareness for designing goods and services accessible to the broadest audience, the need to develop methods to assess the level of awareness of the realisation of universal design maturity in how much universal design in an organisation has become apparent.

Addressing this need, management science has seen the development of a universal design maturity model. The section of the model presented here on the area of offering services and products using digital tools will allow the level of maturity of universal design to be assessed. Other areas will be described in subsequent studies. Subsequent research specifically targeting the beauty industry will ascertain the optimal and requisite level of maturity for this sector.

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