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Accessibility as a factor in reducing the digital divide

Summary. A digital divide is defined as an exclusion affecting people who do not have access to the Internet and other modern information technologies. However, the digital divide also influences those people who have access to the Internet and technologies but due to incompatible tools cannot use it. It particularly concerns the disabled. The paper presents accessibility as a factor in reducing the digital divide targeted at the group of people. The paper is based on literature research and research reports.

Key words: accessibility, usability, UX, digital divide

Introduction

A digital divide is defined as an exclusion affecting people who do not have an access to the internet and other modern information technologies. However the digital divide also influences those people who have an access to the internet and technologies but due to incompatible tools cannot use it. It particularly concerns the disabled. The author develops a thesis in the paper stating that accessibility constitutes a factor in reducing the digital divide.

1. The digital divide and the disabled

Often the literature interchangeably but wrongly applies the terms an information divide and a digital divide. **The information divide** (information gap) according to W. Gogołka is a state where there is a division of a global community into those people who are able, may and want to use the IT potential and those (the majority) who (not all) are barely aware of such needs or who do not have such needs at all¹. As far as the digital divide is concerned it is about splitting the society into those who have an access to the internet and modern communication forms and those who do not have such possibilities. At present one can speak about a new type of social stratification where the divide is made between the connected and the unconnected with the internet.

Nevertheless people connected to the Internet may also be digitally excluded. The digital divide term does not only concern the mere physical possibility of access to the Internet but there are other important factors such as:

- The lack of ability to use the internet (especially among the elderly). The basic barrier in using the Internet is constituted by a mental barrier related to the lack of motivation and sometimes the fear of making use of digital media. It is connected to the fact that e-excluded people do not trust knowledge inter alia new technologies so they do not try to use them independently not knowing how digital media work, how to use them, how much it costs and first of all what they might use it for, what benefits they will have using new technologies in everyday life and work. According to data from the Main Statistical Office from 2011, 9.5 ml Polish citizens do not have access to the Internet which constitutes 33% of households. The largest divide is visible among people with secondary and lower secondary education comprising 9.2 ml of digitally excluded persons. Then there are people over 55 with 6.1 ml people who have not used online resources².

- Poor quality of connection/high costs of a better connection (particularly in smaller towns and villages). In cases of some social groups, first of all when it comes to people with low income, the limitation is also in costs related to new technologies (the equipment, software, operation costs).

- Command of languages (the inability to speak the language the information is provided).

- The lack of accessibility for the disabled people. In this case the barrier lies in the failure to adjust the contents and the form of a message going through

¹ W. Gogołek, *Information Technologies of Media*, ed. II, ASPRA-JR, Warszawa 2006, p. 239, 286.

² *Information Society in Poland. Results of Statistical Research 2006-2011*, ed. D. Rozkruta, MSO Report, Szczecin 2012, www.stat.gov.pl/gus/nauka_technika_PLK_HTML.htm [20.10.2013].

digital media to their needs and possibilities as well as the failure to adjust these possibilities to the software and the equipment. Taking into account the disabled – there are 1.6 ml citizens who are excluded³.

Due to the constant development of the Internet and virtual communities, it is necessary to counteract “the digital divide” of disabled people. Changes should be made to greater accessibility of the disabled to the equipment and the connection to the Internet as well as better understanding the needs of people with disabilities shown by organizations placing information on websites. These changes should occur both on the legal and cultural basis – disabled people constitute a separate group of Internet users with regard to information accessibility and not with regard to needs.

According to the social diagnosis the usage of the internet makes⁴:

- Internet users take more active part in culture than people who do not use the Internet. They more often do sports. Internet users group clearly comprises more socially active people, more involved in local communities and functioning in organizations and associations.

- Internet users not only work more often as compared to non-internet users and additionally if we compare working people, it will turn out that users more often take up a better paid job, more often raise their qualifications and skills in view of better earnings, they are also more frequently promoted. Internet users tend to set up their own business. Using the internet refers to a smaller threat of unemployment and greater chances of finding a job.

In everyday life of a disabled person a computer connected to the internet may perform a few tasks⁵:

- Can be used for standard activities such as writing texts, archiving, browsing and filing photos, doing shopping online etc.;

- Can counteract the social divide by communicating with other people, initiating social relations (through social websites) etc.;

- Perform an educational function by acquiring new skills and broadening knowledge on various fields. Disabled people have worse education than non-disabled people. In 2008, 68% of people over 18 did not have a secondary education. People with impairment tend to have difficulties in receiving or supplementing their education not only on the higher level but also on secondary or even primary level;

- Can be used for earning purposes by activating the disabled and the possibility of working from home to earn money.

³ The Visible Foundation: <http://wizdialni.org/index.php?p=sd&id=89&action=show> [20.10.2013].

⁴ *Social Diagnosis 2013, The Poles facing digital technologies – determinants of accessibility and the usage*, eds. J. Czapiński, T. Panek, 2013, www.diagnoza.com [20.10.2013].

⁵ PFRON, Internet without barriers – accessibility and usability and needs of disabled people, [20.10.2013].

Authorities face a great challenge to make the internet more accessible. There are more and more important matters to be dealt with online. That is why the public administration should pay particular attention to accessibility of their systems. In May 2012 an *Ordinance of the Cabinet on National Framework of Interoperability* came into effect obliging entities carrying out public tasks to adjust their websites for the purposes of digitally divided people.

It imposes a duty of adjusting websites to comply with guidelines of WCAG 2.0 on AA level within 3 years. The Ordinance also stipulates that every website update should be carried out in line with the new guidelines. According to 2013 social diagnosis more widespread usage of information and communication technologies, a growth in their possibilities and indispensability in everyday life, study, work, access to information and knowledge make their users threatened, to a greater extent, with social exclusion⁶. Nevertheless the scale of the digital divide in Poland is not decreasing.

2. Accessibility and the digital divide

Accessibility in simple terms is a science and a collection of standards describing methods and guidelines for creating WWW to provide the highest number of recipients with an easy access. The available websites may easily be used by the blind, visually impaired people, users of less common browsers or mobile platforms. Accessibility is dependent on numerous elements harmonizing with each other. Both tools, namely appropriate software, as well as people creating websites are important. The main reasons for the lack of accessibility of websites are internet tools which do not sufficiently support accessibility and additionally designers of websites are not aware of it and they do not understand its basic aspects. E-accessibility is one of priorities of a Digital Agenda for Europe for years 2010-2015⁷.

An appropriate website design is important to:

- a. Visually impaired and blind people: the internet mainly consists of visual messages so the blind make use of the software which reads the website and generates Braille version (the so called Braille monitor). Visually impaired people may use the internet if websites have icons changing the font size and the contrast.
- b. Deaf people who need a simple conversion of an audio file into a text file.

⁶ *Social Diagnosis 2013...*

⁷ Information of the Digital Agenda of Europe: <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/10/200&format=HTML&aged=0&language=PL&guiLanguage=en> [20.10.2013].

c. Colour blind people; an option removing problems with inability to read certain areas on the website, links etc.

d. People with movement dysfunctions: effective reading information from websites requires operation of various manipulators (e.g. a function computer keyboard). The application of keyboard shortcuts is a simple facilitation.

e. People with cognitive dysfunctions (e.g. Down’s syndrome): adjusting websites to perception of particular recipients such as simplifications of texts, removing animations, icons, advertisements.

Websites designers more often think about visually impaired and blind people and they adjust websites to their needs. Some websites contain references helping to adopt the contents of the website to the needs of visually impaired and blind people e.g. by enlarging them or changing their colours.

Adjusting websites to needs of disabled people is not only a necessity but an urgent must. It will enable digitally divided people to use the contents related to areas included in table 1.

In the author’s view, social contacts are so vital and possible thanks to the Internet when accessibility principles are applied on the internet. It counteracts

Table 1. Benefits from online accessibility for the disabled people

Area	Benefits
E-commerce	Possibility of shopping online: – auctions, – food purchases, – clothes purchases.
On-line services	Possibilities of using: – electronic banking, – consulting services, – finance and time management services etc.
Work	Possibilities of: – looking for a job, – working from home, – initiating business contacts.
Education	Possibility of: – developing professional competences, – learning on-line.
Socialising	Possibility of: – taking active part in social media, – initiating social contacts, – counteracting social divide.

Source: elaboration of one’s own.

the social divide that particularly influences the disabled people. The social divide is a contrary term to social participation in wider communities. It denotes a voluntary or enforced by external conditions (poverty, unemployment, a disability, behaviour not accepted by the environment, sexual preferences or any other) isolation of individuals or social groups from the community and institutions of a contemporary state. The notion of the social divide means:

1. Functioning outside rights and privileges of the society,
2. A structural characteristic of a specific community – placing it on the lowest level of the social hierarchy,
3. Effects of a defined process constituting a sum of the place in the social structure and experiences and expectations of an individual or a social group⁸.

Disabled people who are threatened with a digital or social divide are “thrown” on the margins of contemporary society. In the long term it leads to limitations of assimilation with the society, functioning and it also lowers self-esteem and motivation to make changes in life.

3. Accessibility in practice

Taking into account various types of disabilities, one may claim that technology keeps pace with needs of people with dysfunctions, however it does not hold true for accessibility of the internet⁹. Table 2 presents areas failing to adjust websites to needs of the blind and the colour blind.

Solutions concerning accessibility in this respect are as follows:

- **Buttons for changing the font size displayed on the website.**

A simple feature facilitating communication with visually impaired and elderly people. Possibilities of changing a font: default, medium, big one (fig. 1).

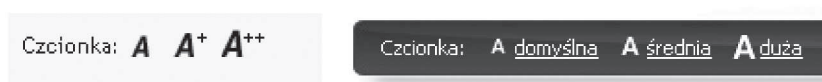


Fig. 1. Buttons for changing the font size on the website

Source: elaboration of one's own.

Mistakes often made in this areas: enlarging function working only in selected area (e.g. headlines), hidden buttons – not visible to the recipient (especially with

⁸ M. Jarosz, *Wstęp. Divide Areas in Poland*, w: *Divided. Social, Material and Ethnic Dimension*, ed. M. Jarosz, ISP PAN, Warszawa 2008.

⁹ More about it: D. Paszkiewicz, J. Dębski, *Accessibility of Websites*, Warszawa 2013.

Table 2. Techniques and inaccessibility of websites to needs of selected groups of the disabled

Type of disability	Technical solutions	Websites inaccessibility areas
Blind or visually impaired people	Blind users have been able to freely use computers for several years thanks to inventions. Speech recognition combined with a screen reader allows a blind person to operate the computer and the installed software.	Not all online services are compatible with screen readers. Most of them contain basic technical errors which make access to information and services more difficult or impossible for blind people.
Colour blindness, tritanopia and monochromacy*		Disorders in seeing colours influence the usage of websites. In case of all disorders related to seeing colours, one has to remember about an important rule: a colour cannot be the only way of conveying information on the website.

* No possibility of seeing red (protanopia), other do not see green – deuteranopia called colour blindness. The lack of possibility differentiating yellow and blue (tritanopia). There are also people having problems with seeing any colours (monochromacy).

S o u r c e: own elaboration on the basis of D. Paszkiewicz, J. Dębski, *Accessibility of websites*, Warszawa 2013.

poor eyesight people), buttons not accessible from the keyboard level and enlarging a text is slight¹⁰.

– **A setting up option: big contrast.**

This is a simple, alternative option to set up a contrast on the website (on some websites there are alternative colour version). The website designed in light colours (majority of websites) has a possibility of switching into a „negative” version in which most colours change into “reverse”. The background remains dark, texts are in light colours. Another option is to put on the main page an icon changing the contrast – after clicking the icon one may set up a big contrast of the website which is facilitation for people with poor eyesight.

– **Recognition of the websites by contents reading software.**

The website should be recognised by reading software for the blind. It makes the use of the website easier and in some cases of dysfunctions it enables reading.

The next group of the disabled comprises deaf and poorly hearing people. Table 3 presents areas of inaccessibility of websites for the deaf and people with colour recognition dysfunctions.

¹⁰ On the basis of *Accessibility of Websites*, State Rehabilitation Fund of the Disabled, Warsaw 2012, www.pfron.org.pl/ftp/publikacje/PODRECZNIK.pdf [20.10.2013].

Table 3. Areas of non-adjustment of websites to needs of the deaf and people with colour recognition dysfunctions

Type of disability	Areas of non-adjustment of websites
Deaf or hearing impaired	When it comes to accessibility, deaf people have problems with access to multimedia contents. Videos with no subtitles or translation into sign language are out of reach for those users.

Source: own elaboration on the basis of D. Paszkiewicz, J. Dębski, *Accessibility of Websites*, Warszawa 2013.

Solutions related to accessibility are as follows:

– **Listening to the contents of a website. “Talking page” feature**

Some websites have a built-in possibility of listening to the content, processed by speech recognition. Websites should contain a loudspeaker icon which can be pressed by a disabled person to listen to the contents¹¹.

– **Placing materials for deaf people**

Placing materials for deaf people – most often in the form of videos including translation into a sign language.

Summing up

Due to the constant development of the internet and virtual communities it is necessary to counteract the “digital divide” of disabled people which in turn may result in social divide. According to the author accessibility constitute a factor in reducing the digital divide of disabled people. Solution is also seen in introduction of an “easy-read” website which a simplified version¹². It should be characterised by a simple language, communicativeness, audio description on the website¹³, easy navigation and adjustment to various functions. However it makes website designers look not only at the design and usability of the website but also at disabled people to facilitate their movements in the virtual world by introducing simple accessibility solutions sometimes.

¹¹ Google is an example of good practice – to meet needs of the blind Google has introduced voice messages informing about events on the screen. Web services of Google support tools reading texts such as JAWS, VoiceOver or ChromeVox: www.google.com [20.10.2013].

¹² Easy-read: www.mencap.org.uk/easyread [20.10.2013].

¹³ Audio description is valuable to films and works of culture. The technique consists in describing features of a film that are not accessible in voice but result from the visions. Thanks to audio description the blind have a broader image and a better reception of the contents of the film. More information: www.audiodeskrypcja.org/viewpage.php?page_id=1 [20.10.2013].

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Accessibility jako czynnik redukcji cyfrowego wykluczenia

Streszczenie. Wykluczenie cyfrowe definiowane jest jako wykluczenie, które dotyka osób, niemających dostępu do Internetu i innych nowoczesnych technologii informacyjnych. Jednakże wykluczenie cyfrowe dotyka także te osoby, które mając dostęp do Internetu i technologii nie mogą, z racji niedopasowania narzędzi, z nich korzystać. Szczególnie dotyczy to osób niepełnosprawnych. Artykuł prezentuje *acesability* jako czynnik redukcji cyfrowego wykluczenia, związanego z osobami niepełnosprawnymi. Artykuł oparty jest na badaniach literaturowych oraz raportach badawczych.

Słowa kluczowe: użyteczność, dostępność, doświadczenie użytkownika, społeczne wykluczenie