Remote Banking Services for the Visually Impaired in Britain as a Tool for Creating Barrier-Free Environment

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ABSTRACT

The paper analyses remote banking services in Britain as far as the visually impaired people's work with them is concerned. Most of the websites have a minimum level of accessibility for these people, especially the sites of the banks with foreign capital. Large banks with a great number of branches, on the contrary, provide full access to banking services on their websites. The paper discusses the world experience of the banking system in providing the disabled people with an opportunity to actively participate in all spheres of society by creating a barrier-free environment with the introduction of innovative products and electronic means of communication. Apart from the implementation of social protection mechanisms, the benefits obtained by the banks fully compensate for the costs incurred. The information in the paper is of practical interest for experts in sociology of disability, as well as for public organizations helping disabled people.

Keywords: barrier-free environment, sociology of disability, visually impaired people, virtual social environments, access to banking services, social protection

INTRODUCTION

According to WHO, the number of disabled people in the modern world is more than 1 billion people or about 23% of the total population of the planet [1]; and each year their number increases [2]. Objectively existing physical limitations of the disabled people lead to limited social opportunities for this category of people, and as a consequence, to social inequality [3]. Therefore, the world community is facing the need to search for new ways of social adaptation of the visually impaired to the life in the civil society which by default is a "society of the healthy" [4]. In our opinion, this problem will not lose its relevance, even if the disabled constitute the majority or even if the whole society consists only of them.

A great number of the visually impaired people (and according to the estimation by WHO it is 285 million, including 38 million blind people) demand special attention. For blind or partially sighted people disability means that they are unable to perceive information through a visual channel. Consequently, their communication opportunities are severely limited.

In recent years, using innovative products and electronic means of communication has become more common among the visually impaired people. This encourages creation of a barrier-free environment and a more active inclusion of the visually impaired people in public life [5].

The world experience shows that not only the state and public organizations participate in the processes of the social integration of disabled people, but the banking sector enabling the use of the opportunities opened up by modern technological achievements is also involved. The factor influencing this structural phenomenon is associated not only with economic benefits but also with changes in the priorities of state social policy, with the institute of public opinion and the status of the bank in the emerging system.

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In our previous works the issue of creating a barrier-free environment for visually impaired people was discussed; the results of the research of the Internet resources accessibility for the visually impaired in EC [6] and Russia [7] were reported. Practical steps taken by various states to smooth out the social inequality of such people concerning the access to information and the performance of information communications were discussed. Examples of using the existing virtual social environments for the visually impaired were given.

This paper analyzes the accessibility of banking Internet resources for people with visual impairments in Britain as a tool for creating a barrier-free environment.

LITERATURE REVIEW

At present, the term 'disability' is being revised from traditional [5] to the one meaning some specific feature that prevents a person from leading a full, traditional in the common sense, life. The main tasks set by social institutions and international healthcare organizations are to provide or create conditions that allow people with disabilities to become full members of civil society [4, 8].

Development of information-communication technologies facilitates the disabled people's integration in the civil society [9, 10]. According to the International Telecommunication Union, in 2016 the number of Internet users reached 3.5 billion people. The global Internet is among the leading mass media with a number of advantages over other media: high speed on-line exchange of information in large volumes, prompt delivery of information to a potential user; democratic resource, accessibility, etc.

Becoming familiar with the Internet virtual social environments allows visually impaired users to solve various social issues (work, paying housing, signing up for an appointment with the doctor, etc.), raise their level of education, and focus on various areas of art and culture [10].

So that the visually impaired people can access information, special equipment is used: an audio display (a program of screen access combined with a speech synthesizer), a tactile display or the Braille keyboard and a program for screen magnification. To align the work of tactile displays and audio displays with internet browsers and to provide access to the internet resources certain software is needed; in addition, the site developers must satisfy the requirements of accessibility for the visually impaired [3]. The European Union uses the Web Content Accessibility Guide of W3C (World Wide Web Consortium), which gives recommendations as to how to make Web content more accessible for a wide range of users with disabilities, including visually impaired ones [7]. It outlines four basic principles of building a website: it must be perceivable, operable, understandable, and robust. The principles are described in the provisions that set the general framework and define the regulatory requirements for the performance criteria and optimal use of technology. Meanwhile, partial implementation does not violate general standards.

METHODOLOGICAL FRAMEWORK

The purpose of the authors' research is to study the accessibility of remote banking services for the visually impaired in Britain.

The main objectives of the research are:

1. To make the concept of disability clear within the framework of a socio-information field, from the viewpoint of access to a full life.
2. To describe the basic principles that determine the regulatory requirements for web content for a wide range of people with disabilities, including the visually impaired.
3. To analyze priority areas in the UK state policy helping to protect the visually impaired.
4. to study significant organizations involved in creating a barrier-free environment with the introduction of innovative products and electronic communication tools.
5. To identify the role of the UK banking system in the integration of the visually impaired into the civil society by creating accessible remote banking services.
6. To develop parameters for the assessment of the UK banking system websites as to the opportunities for visually impaired people to have communications and to make necessary technological operations.

In order to solve the set tasks, regulatory legal documents on social protection of the visually impaired were analyzed; systemic analysis, synthesis and a generalization method were applied.

For the selected requirements which correspond with the norms for the visually impaired people, in order to assess the websites of the UK banking system, an 11-point scale was used; an ordinary "yes/no" method of visualization was applied, when in the presence of the specified parameter on the website the parameter took the value 1", and otherwise, "0".

Table 1. The most significant organizations creating a barrier-free environment with the introduction of innovative products and electronic means of communication

Name, website	Sphere of activity
Guide Dogs for the Blind Association http://www.guidedogs.org.uk	Trains and provides guide dogs; renders other services as well that increase mobility and independence of blind and partially sighted people.
British Blind Sport http://www.britishblindsport.org.uk	A charity sport organization for blind and partially sighted people
BCAB, British Computer Association of the Blind https://www.bcab.org.uk	A working group of blind and partially sighted computer users. It offers teaching, discussion, creation of networks and assistance to all of its members. Established in 1969 it is the oldest computer association of blind and partially sighted users in the world. People of all levels of qualification, interests and abilities are among its members.
The British Council for Prevention of Blindness http://www.bcpb.org	Was established in 1976 as a registered charity to fund scientific research into blindness prevention and sight restoration.
British Wireless for the Blind Fund http://www.blind.org.uk	Has been supplying specially adapted wireless radios to visually impaired people for 80 years
Royal National Institute of Blind People, RNIB http://www.rnib.org.uk	Covers all spheres of life of the 2 mln people with sight loss.
The Royal Society for Blind Children http://rsbc.org.uk	Supports blind and partially sighted children and young people from 0 to 25 years old and their families; provides financial assistance.
Knowsley Disability Concern http://www.kdc.org.uk	Originally established in 1977 as a service for adults with learning disabilities, KDC has developed and evolved into a modern, forward-thinking organization specializing in delivering services to support people with disability to live independent lives in the community.
International Glaucoma Association http://www.glaucoma-association.com	The mission is to raise awareness of glaucoma, to promote research related to early diagnosis and treatment, and support patients and all those who care for them.
Henshaws https://www.henshaws.org.uk	One of the oldest charities in GB, it provides its expertise, teaching and consultations for all having sight loss to help them develop skills for independent everyday life.
Deafblind UK http://deafblind.org.uk	National specialized service for the support of deaf and blind people
Sightline Vision North West http://www.sightlinevnw.co.uk	Psychological assistance to people with disabilities
Action for Blind People https://actionforblindpeople.org.uk	Was established in 1857 as the Surrey Association for the General Welfare of the Blind and then became London Association for the Blind. In the beginning its main lines of work were teaching the blind to read and master a practical occupation, such as making baskets. Currently, the organization covers all areas of assistance to people with visual impairments, including access to a number of technologies, from computers to TV sets, and from smartphones and pads to video magnifiers.
Bradbury Fields http://www.bradburyfields.org.uk	Local charity for blind and partially sighted people living in the Merseyside Area
RNIB Library http://www.rniblibrary.com	The largest in Europe, with over 60,000 items in the collection. All the services are free for partially sighted people: Audio, Braille, Music. It is possible to read on-line.
RNIB Newsagent http://www.tnauk.org.uk	Free delivery of daily newspapers, magazines and periodicals on audio CD or USB. If one has a mobile phone or computer, he/she gets the daily paper or magazine delivered to the inbox or downloads from the website
SeeAbility https://www.seeability.org	Aims at encouraging people with sight loss and multiple disabilities to fully realize their potential and raise their life quality. It was founded as The Royal School For The Blind in the 18-th century.
Sense https://www.sense.org.uk	Offers high quality, flexible services across the UK, using skilled staff and a network of volunteers, tailoring the support to the individual needs
UCanDoIT http://www.ucandoit.org.uk	Has been working since 1998. It teaches people with disabilities how to use computers, with a particular focus on Internet and email skills. The sessions are done on a one-to-one basis and free of charge. So far the team of 65 non-staff tutors has delivered 50000 individual training sessions

RESULTS AND DISCUSSION

Barrier-free Environment in the UK

According to Access Economics, in the UK in 2009 there were almost 2 million people having vision loss. This community includes about 360000 people registered as blind or partially sighted who have severe and irreversible vision loss. The state policy of the protection of the disabled people is aimed at providing a wide social benefits package: a weekly disability allowance is from 33.6 to168 GBP, depending on the disability level [11]. In addition, there are various substantial benefits for buying medicines, medical devices, wheelchairs and others. The payment of housing and communal services, as well as the maintenance of the living quarters, is partially carried out at the expense of the local municipalities.

Public organizations, foundations and libraries of the UK actively work for creating a barrier-free environment with the introduction of innovative products and electronic means of communication. Information on the most significant organizations is given in **Table 1**.
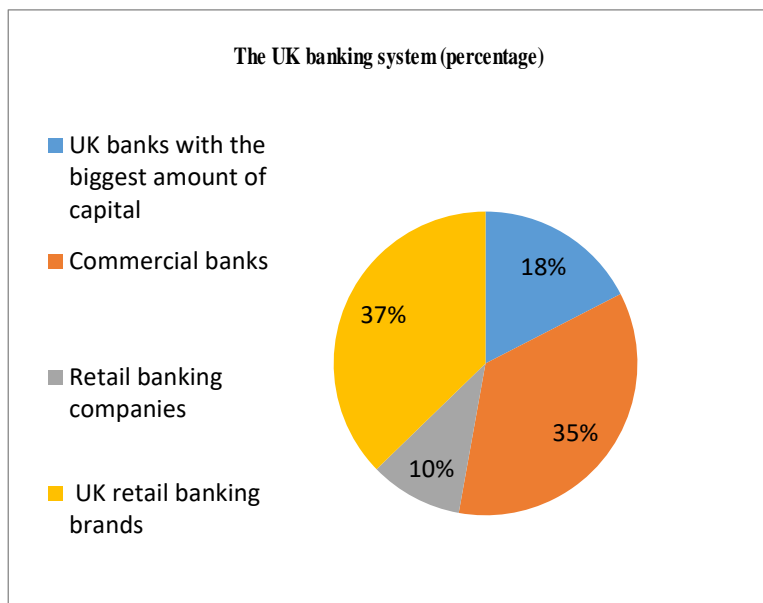
Figure 1. The UK banking system (percentage)

The UK Banking System

The paper is concerned with the analysis of the accessibility and quality of the UK banks websites for the visually impaired.

The UK banking sphere dates back to the 17th century and is now represented by several levels (see **Figure 1**). The top position is occupied by the Bank of England, the area of activity of which extends to protecting the national currency and ensuring its stability, as well as to the development and strengthening of the banking and financial systems. The second level is taken by commercial banks under foreign and domestic control, and securities accounting companies. The third level is occupied by building societies and credit unions. The main suppliers of credit resources are banks, which is the reason of their high proportion.

Fierce competition and the need to increase profits force banks to use all the tools for attracting customers. As a result, banks are focused on using the latest achievements in the field of information and communication technologies; and the customers with low vision are ready to use remote banking services, which was demonstrated by the Aberdeen Business School survey of blind and visually impaired people who use electronic information services [12]. When asked if they used the Web for banking, 27.2% of respondents said yes, 9% said they had tried but found the websites inaccessible to use.

Analysis and Assessment of the UK Banks Websites

56 UK banks were selected for this study from the existing lists [13, 14]. Of these, 10 banks are those with the biggest amount of capital, 20 are commercial banks, 5 are retail banking companies, 21 are the UK retail banking brands belonging to foreign banks (including one branch of a Russian bank). The Internet addresses of the official websites of the investigated banks are given in **Table 2**.

Table 2. Internet addresses of the official websites of the banks under research

N	Bank name	Official website
UK banks with the biggest amount of capital		
1	HSBC Holdings	http://www.hsbc.com
2	Barclays PLC	https://www.home.barclays
3	National Westminster Bank	http://personal.natwest.com
4	Midland Bank	https://www.midland.bank
5	Royal Bank of Scotland Group	http://www.rbs.com
6	Lloyds Banking Group	http://www.lloydsbankinggroup.com
7	Standard Chartered PLC	https://www.sc.com/en
8	TSB Bank	http://www.tsb.co.uk
9	Nationwide	http://www.nationwide.co.uk
10	Santander	http://www.santander.co.uk
Commercial banks		
11	Airdrie Savings Bank	https://airdriesavingsbank.com
12	Aldermore	http://www.aldermore.co.uk
13	Arbuthnot Latham	http://www.arbuthnotlatham.co.uk
14	C. Hoare & Co	http://www.hoaresbank.co.uk
15	CAF Bank	https://www.cafonline.org
16	Charity Bank	https://charitybank.org
17	Close Brothers Group	http://www.closebrothers.com
18	CYBG plc	http://www.cybg.com
19	Coutts	https://www.coutts.com
20	Duncan Lawrie Bank	https://www.duncanlawrie.com
21	Hampden & Co. plc	https://www.hampdenandco.com
22	Julian Hodge Bank	http://www.julianhodgebank.com
23	Metro Bank	https://www.metrobankonline.co.uk
24	N M Rothschild & Sons	https://www.rothschild.com
25	Raphaels Bank	https://www.raphaelsbank.com
26	Secure Trust Bank	https://www.securetrustbank.com
27	Shawbrook Bank	https://www.shawbrook.co.uk
28	Unity Trust Bank	https://www.unity.co.uk
29	Virgin Money	http://uk.virginmoney.com
30	Weatherbys	https://www.weatherbys.co.uk
Retail banking companies		
31	Sainsbury's Bank of the UK Sainsbury supermarket company	https://www.sainsburysbank.co.uk
32	Co-operative Bank	http://www.co-operativebank.co.uk
33	Harrods Bank belonging to Harrods, a department store in London	https://www.harrodsbank.co.uk
34	Post Office Money	http://www.postoffice.co.uk
35	Tesco Bank of Tesco supermarket company	http://www.tescobank.com
UK retail banking brands with foreign capital		
36	Allied Irish Bank (GB) belonging to AIBGroup in Ireland	https://aibgb.co.uk
37	Axis Bank UK, India	http://www.axisbankuk.co.uk
38	Bank of Ceylon (UK), Sri Lanka	http://www.bankofceylon.co.uk
39	Bank of Baroda (UK), India	https://www.bankofbarodauk.com
40	Bank of China (UK), China	http://www.boc.cn/en/index.html
41	Bank of India (UK), India	http://www.bankofindia.uk.com/english/home_uk.aspx
42	Zenith Bank (UK), Nigeria	https://www.zenithbank.com
43	Bank of Ireland UK, Ireland	https://www.bankofireland.com
44	Citybank (UK), Citygroup in the USA	https://online.citi.com
45	ICBC (lONDON) plc, China	http://www.icbc.com.cn/icbc/sy/default.htm
46	ICICI Bank (UK), India	http://www.icicibank.co.uk
47	Danske Bank, Denmark	http://www.danskebank.co.uk
48	Punjab National Bank (Internation.), India	https://www.pnbint.com
49	SEB (UK), Sweden	http://sebgroup.com
50	Silicon Valley Bank UK, the USA	http://www.svb.com
51	State Bank of India (UK), India	http://www.sbiuk.com
52	Svenska Handelsbanken, UK Branch, Sweden	http://www.handelsbanken.com
53	The Bank of East Asia, UK Branch, Hong Kong	http://www.hkbea.com
54	TSB Bank, Spain	http://www.tsb.co.uk
55	Union Bank of India (UK) Ltd, India	http://www.unionbankofindia.co.in
56	Alfa Capital Markets (UK)	https://alfabank.ru/gbr

Assuming that consumers of information and sources for feedback are visually impaired people, the following requirements were chosen as the basic parameters for assessing the UK banking system websites:

1. A text version of any non-text content for its possible conversion to alternative forms, convenient for different users (enlarged font, Braille, audio) must be provided.

2. An alternative text version of media content or an alternative audio record must be provided.
3. Content must be provided in various forms without any loss of data or structure (adaptability), e.g. with a simpler layout of the page.
4. Graphic files must have an accompanying text that explains the picture.
5. A table must have a minimum level of nesting and not many cells.
6. Information provided in PDF files in the form of a text must be correctly sounded in standard programs for viewing files of this format, using screen access software.
7. Full keyboard control, "hot keys".
8. The hyperlink *accessibility.*
9. The hyperlinks *increase font, contrast, audio analog.*
10. An alternative site version for the visually impaired.
11. Maximum compatibility of content with the existing and developed user applications and browsers, including assistive technologies.

For primary analysis the *yes/no* method of ordinary visualization was used: in the presence of the specified parameter on the website, the parameter takes the value 1, otherwise, 0. The results are presented in **Table 3**.

Table 3. The UK banking system assessment results

№	Bank name	1	2	3	4	5	6	7	8	9	10	11	Score
							The UK Banking System						
	UK banks with the biggest amount of capital												
1	HSBC Holdings	1	1	1	1	1	1	1	1	0	0	1	9
2	Barclays PLC	1	1	1	1	1	1	1	1	0	0	1	9
3	National Westminster Bank	0	0	0	0	1	0	1	1	0	0	1	4
4	Midland Bank	0	0	0	0	1	0	0	0	0	0	1	2
5	Royal Bank of Scotland Group	0	0	0	0	1	0	1	1	0	0	1	4
6	Lloyds Banking Group	1	1	1	1	1	1	1	1	0	0	1	9
7	Standard Chartered PLC	0	0	0	0	1	0	0	0	0	0	1	2
8	TSB Bank	1	1	1	1	1	1	1	1	0	0	1	9
9	Nationwide	1	1	1	1	1	1	1	1	0	0	1	9
10	Santander	1	1	1	1	1	1	1	1	0	0	1	9
	Commercial banks												
11	Airdrie Savings Bank	0	0	0	0	1	0	0	1	0	0	1	3
12	Aldermore	0	0	0	0	1	0	0	0	0	0	1	2
13	Arbuthnot Latham	0	0	0	0	1	0	0	0	0	0	1	2
14	C. Hoare & Co	0	0	0	0	1	0	0	0	0	0	1	2
15	CAF Bank	1	0	0	0	1	0	0	1	1	0	1	5
16	Charity Bank	0	0	0	0	1	0	0	0	0	0	1	2
17	Close Brothers Group	1	1	1	1	1	1	1	1	0	0	1	9
18	CYBG plc	0	0	0	0	0	0	0	1	1	0	1	3
19	Coutts	1	0	0	0	1	0	0	1	1	0	1	5
20	Duncan Lawrie Bank	0	0	0	0	0	0	0	0	0	0	1	1
21	Hampden & Co. plc	0	0	0	0	0	0	0	0	0	0	1	1
22	Julian Hodge Bank	1	1	1	1	1	1	1	1	0	0	1	9
23	Metro Bank	1	0	0	0	1	0	0	1	0	0	1	4
24	N M Rothschild & Sons	1	0	0	0	0	0	0	0	0	0	1	1
25	Raphaels Bank	0	0	0	0	0	0	0	0	0	0	1	1
26	Secure Trust Bank	0	0	0	0	0	0	0	0	0	0	1	1
27	Shawbrook Bank	0	0	0	0	1	0	0	1	0	0	1	3
28	Unity Trust Bank	1	1	0	1	1	1	1	1	0	0	1	8
29	Virgin Money	0	0	0	0	0	0	0	1	0	0	1	2
30	Weatherbys	0	0	0	0	0	0	0	0	0	0	1	1

Table 3 (continued). The UK banking system assessment results

Nº	Bank name	1	2	3	4	5	6	7	8	9	10	11	Score
						The UK Banking System							
						Retail banking companies							
31	Sainsbury's Bank of the UK supermarket company	0	0	0	0	0	0	0	0	0	0	1	1
32	Co-operative Bank	1	1	1	0	1	1	1	1	0	0	1	8
33	Harrods Bank belonging to Harrods, a department store in London	0	0	0	0	0	0	0	0	0	0	1	1
34	Post Office Money	1	1	1	1	1	1	1	1	0	0	1	9
35	Tesco Bank of Tesco supermarket company	1	0	0	0	1	0	1	1	0	0	1	5
						UK retail banking brands beloning to foreign banks							
36	Allied Irish Bank (GB) belonging to AIBGroup in Ireland	1	1	1	1	1	1	1	1	0	0	1	9
37	Axis Bank UK, India	0	0	0	0	0	0	0	0	1	0	1	2
38	Bank of Ceylon (UK), Sri Lanka	0	0	0	0	0	0	0	0	0	0	1	1
39	Bank of Baroda (UK), India	0	0	0	0	0	0	0	0	0	0	1	1
40	Bank of China (UK), China	0	0	0	0	0	0	0	0	0	0	1	1
41	Bank of India (UK), India	0	0	0	0	0	0	0	0	0	0	1	1
42	Zenith Bank (UK), Nigeria	0	0	0	0	0	0	0	0	0	0	1	1
43	Bank of Ireland UK, Ireland	1	1	1	1	1	1	1	1	0	0	1	9
44	Citybank (UK), Citygroup in the USA	0	0	0	0	0	0	0	0	1	0	1	2
45	ICBC (LONDON) plc, China	0	0	0	0	0	0	0	0	0	0	1	1
46	ICICI Bank (UK), India	0	0	0	0	0	0	0	0	0	0	1	1
47	Danske Bank, Denmark	0	0	0	0	0	0	0	0	1	0	1	2
48	Punjab National Bank (International), India	0	0	0	0	0	0	0	0	0	0	1	1
49	SEB (UK), Sweden	0	0	0	0	0	0	0	1	0	0	1	2
50	Silicon Valley Bank UK, США USA	0	0	0	0	0	0	0	0	0	0	1	1
51	State Bank of India (UK), India	0	0	0	0	0	0	0	0	1	0	1	2
52	Svenska Handelsbanken, UK Branch, Sweden	0	0	0	0	0	0	0	0	0	0	1	1
53	The Bank of East Asia, UK Branch, Hong Kong	0	0	0	0	0	0	0	0	1	0	1	2
54	TSB Bank, Spain	1	1	1	1	1	1	1	1	0	0	1	9
55	Union Bank of India (UK) Ltd, India	0	0	0	0	0	0	0	0	0	0	1	1
						Branches of Russian banks							
56	Alfa Capital Markets (UK)	0	0	0	0	0	0	0	0	0	0	1	1

The maximum score on the 11-point scale is 9 points (81.8%) (see **Figure 2**). This number of points is mostly assigned to banks supporting the WCAG 2.0 standards. Parameters for which these points are awarded are 1, 2, 3, 4, 5, 6, 7, 8, 11. This category does not use the hyperlinks *an alternative website version, increase font, contrast, audio analog*, arguing that the site structure and its content provide full access for the visually impaired people who use suitable equipment, therefore they do not need additional hyperlinks.
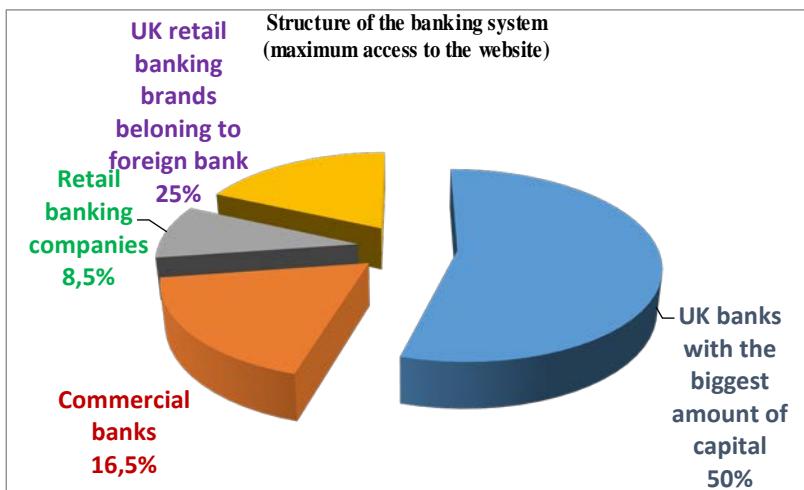
Figure 2. The structure of the banking system (maximum access to the website)
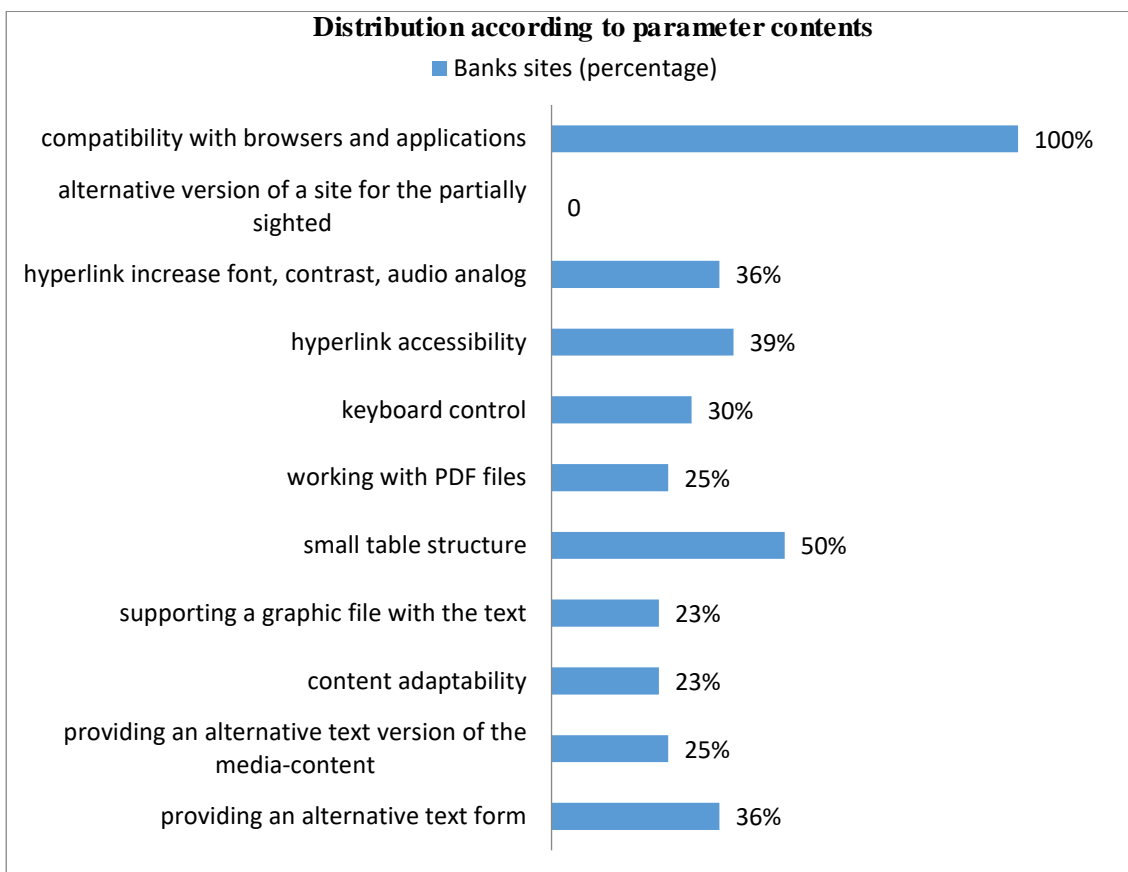

**Figure 3.** Distribution of banks according to parameter contents

All websites of the UK banks are compatible with the existing user applications and browsers (see **Figure 3**). Through your browser settings, you can go to the version for people with low vision. Keyboard shortcuts allow enlarging the text or going to work in browsers, using the keyboard. For example, the browsers *Internet Explorer, Mozilla Firefox, Google Chrome, Opera* use the keyboard shortcuts: increase - Ctrl + "+", decrease - Ctrl + "-"; the *Safari* browser: increase - Cmd + "+", decrease - Cmd + "-". Thus, the minimum number of primary points scored by all the banks' websites is 1 for the criteria *compatibility with browsers and applications*.

Distribution of indicators for all the parameters shows that the main part of developers and leaders of customer services followed the conditions for meeting the minimum demands of users with low vision: 59% of the websites scored 1or 2 points; 16.2% satisfy from 3 to 5 accessibility criteria (see **Figure 4** and **Figure 5**).
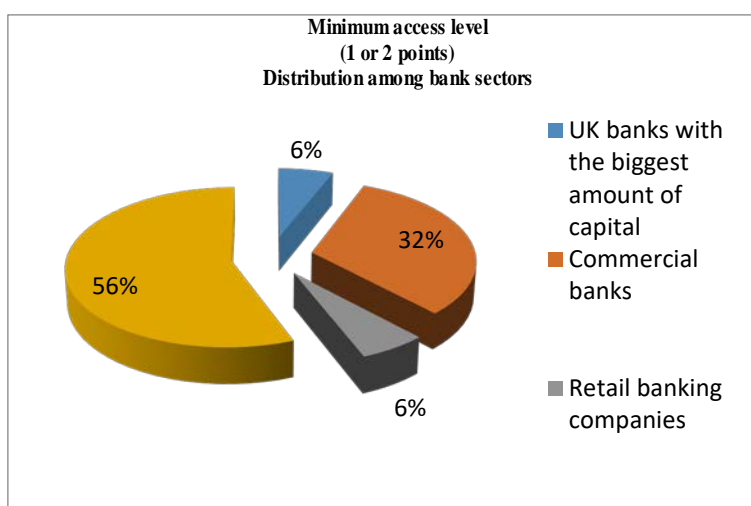
Figure 4. Distribution among bank sectors, minimum access level (1 or 2 points)
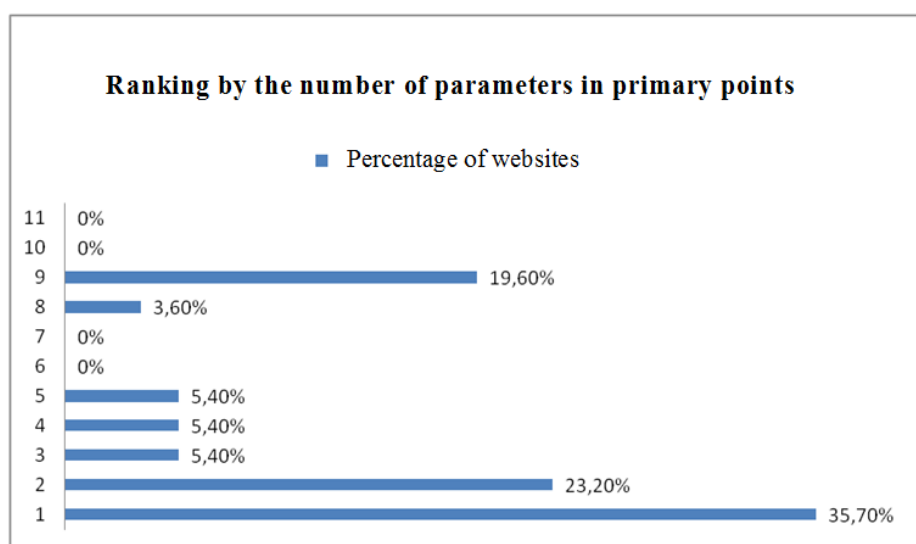
Figure 5. Ranking by the number of parameters in primary points

The conducted research indicates the UK trend to change the approaches in the indirect work with customers and with a traditional image of the customer.

The analysis of the bank websites allows indicating the criteria for the assessment of the activity in terms of an accessible environment for the visually impaired and checking their effectiveness in these customers' daily practices.

CONCLUSION

In the modern world, disability is a problem of the whole society. The main task of the state social policy is to provide the disabled people with an opportunity to actively participate in all spheres of the society's life through creating a barrier-free environment with introducing innovative products and electronic means of communication. In this process not only public organizations, foundations and libraries can play a leading role but the banking system as well.

The conducted research using the UK as an example shows that its banking sector is interested in attracting people who have low vision, when the benefits may fully compensate for the costs incurred. At the same time most of the websites are minimally accessible, particularly those of the banks with foreign capital. Contrary to them, large banks with a great number of branches provide full access to the banking services on their websites. The leading factor in this process is the state support of the disabled, including the visually impaired; as well as the formed institute of public opinion. But the insufficient knowledge of how the banking sector influences the creation of the barrier-free environment by modern electronic technologies has a negative effect on this process.

For a more effective work, adaptation of websites to the needs of the visually impaired must be done permanently, in close cooperation with standards developing companies, experts and public organizations helping the disabled. This will not only allow prompt response to emerging external changes, but will also enable the creation of an effective organizational-functional model of diagnosis and analysis.

ACKNOWLEDGEMENTS

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