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Web Accessibility and Digital Businesses: The Potential Economic Value of Portuguese People with Disability

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Abstract

The lack of data in Portugal is a crucial problem for a full characterization and thus a full digital integration for people with disabilities. This is not only a problem of ethic dimension or equal opportunities but have also an economic dimension because excludes a consumer group with economical potential. Hence, this article focuses on the importance of the characterization of people with disabilities in a social, economic and digital perspective. It aims to emphasize their disabilities and ageing evolution, potential value in the digital business and design awareness for inclusion for improve the quality of life of people with disabilities.

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1. Introduction

Web accessibility has a major role by guaranteeing that contents can be accessed by each user, regardless of their special needs [1]. For this concept to work it is necessary to know who these users are and which their disabilities are. The definition of people with disability does not apply exclusively to whom possesses one type of disability (e.g., hearing impairment, motor, vision impairment and intellectual) but also applies to whom, in any moment or situation, experiences incapacity to access to a content or service [2].

Some types of disability are directly related to ageing. The United Nations anticipate that in 2050, about 40% of the European population will have above 60 years old. With the increase number of elderly people, increases also the number of people with disability [3]. INE (The Portuguese National Statistics Institute) data also indicates that in the last decade, the number of ageing population has grown. In 2011, Portugal has about 19% of population with 65 or more years old [4]. The average age of population with disability was, by the time of the 2001 Census, about 53 years old, more than 13 years comparing to the total resident population (39,5 years old), showing a very aged

population [5] [6]. We should refer that this average age diverged depending on the different disabled groups. The tendency is from every group, except the mental disability and cerebral paralysis, to concentrate in average older ages. According to Gonçalves [5] (2003), the Ageing Index calculating and the relation between the elderly and the young population (aged 0-14) confirm the data described above. In 2001, for each youngster with disability aged 0-14, there were 6 individuals with disability over 65 or more years old, in the total resident population.

Our motivation is to underline the importance of web accessibility awareness, emphasizing the inclusion of people with disability in a global digital environment by doing the group's characterization and raise consciousness for their potential value in digital businesses. As investigation methods it is used documental and statistic analysis.

This document is structured in five sections essential for the theme's comprehension. It begins with the background, where the main concepts for the study of web accessibility and the contextualization of the theme are exposed. Next, we present the characterization of the population with statistic data provided by INE and other relevant entities/organizations. In the third section we analyze and discuss the characterization and evolution of the population and the contribution of the new technologies (internet, mobile networks) for the inclusion of this people. We conclude with final reflections about the theme.

2. Background

In the 60's, McLuhan [7] used, for the first time, the concept of "global village" to describe electronic technologies (radio and TV) and communication techniques of the individuals. Although he did not knew about the evolution of new technologies (internet, mobile devices and digital TV), he already define them as capable to aggregate a true global virtual community, not only because it allows the inter-personal communication but above all it embraces *all* of us at the same time. This evolution in communications determines the concerns in the access to these digital environments. The main objective is that the access would not be denied or limited, aiming to transform web content, accessible to *all* [8].

The accessibility historical problem arises because: who produced the contents ignored users with disability and used tools in the creation of websites which makes them inaccessible; there were not any guidelines and there were not enough available support [9]. At this point, the internet accessibility take the main role to guarantee that every application and contents can be accessed and used by every potential users, regardless their (in) capacities, limitations, different contexts of use (e.g., noisy surroundings, under- or over-illuminated rooms, etc.) or the user agent they are using (e.g., computer, mobile phone, voice browser, desktop browser) [1].

As Tim Berner-Lee stated *"The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect"* [9].

According to the World Health Organization (WHO) [2], a person with disability involves: impairment (problem in the body's function or structure); limited activity (difficulty found in the execution of a task or action by an individual); and a restricted participation (problem experienced by an individual in a specific daily basis situation).

Nowadays, new technologies encourages the universality of users in the access to internet, but also increases problems of accessibility, in case of, not prospecting the individual differences in the construction of accessible contents [10]. Admittedly, the internet drives the quality of life of people without disability. Imagine the advantages that will bring for people with disability in the different platforms. For example, the social networks are platforms which offer enormous opportunities at a professional and recreation level, in social and business areas, without physical barriers and present a lot of advantages for people with disability. But the accessibility problems emerge already in the registration to the access [11]. In the case of e-commerce's platforms, which allows the sale, products and services, lacks accessibility optimization, in order to captivate and secure the loyalty of the biggest number of costumers, to increase the sales. In this perspective, the organizations which aim to maximize their profits, by attracting the major number of costumers, need to invest in accessibility. Therefore, these platforms must be accessible by personal, social and political imperatives and even by legal demand.

The Human Rights Chart gives the people with disability the rights which were denied in the past. Portugal was the first European country and the fourth worldwide to define and legislate rules for web accessibility [8]. In July 2000, the European Council approved a Plan of Action "e-Europe 2002", implementing the Portuguese initiative in fifteen EU countries [12]. In the USA, since 1998, with the Rehabilitation Act – section 508, it was established the illegality of a federal website containing inaccessible information and online services for people with disability,

while they are accessible to people with no disability [11] [6]. Unfortunately, from theory to practice there is a long way to walk. “The law exists but it’s hard to obey it.” [13].

Outlined below are some examples of studies of the characterization of people with disability in other countries, in order to verify its importance.

Great Britain is one of the countries which make more research in the characterization of this population, presenting some very interesting statistics:

- ∞ About 33% (aged 50 till retirement age) have one or more disabilities [14].
- ∞ 1 in each 3 persons has disability or has a friend or knows someone that has a disability [15].
- ∞ The annual estimation purchasing power for people with disability is 80 billion pounds [16].
- ∞ An accessible website can increase till 17% the online company’s market with the increase of traffic [17].
- ∞ 75% of the companies from Financial Time London Stock Exchange (FTSE) Index which are listed in London Stock Exchange does not satisfy the minimum levels of access to internet, which cause them losses over 147 million pounds [3].

In 2005, also in the UK, it was made a research study which determines the total purchasing power of people with disability, with annual values over 120 billion pounds (132 billion euros) [9]. This indicates that a website with accessibility problems can be losing a great amount of money.

According to the USA Department of Labor, the person with disability purchasing power is about 175 billion dollars. Four times higher than the teenagers purchasing power (aged 8-14), a public target quite regulated by the American companies [18] [19].

There are specific studies to analyze the people with disability purchasing power for different market segments, as the example of a study of a supermarket chain. Their 35.000 pounds investment, in order to turn their website more accessible, has generated an additional annual income of 13 million pounds [20] [21]. These studies are becoming increasingly important for a real portrait of a country, including questions regarding people with disability in census questionnaire, adding statistics in company’s business plans and having in mind this public target, are all essential data for the evolution of a inclusive, fair and economic society.

In Portugal, we have only a glimpse of the reality about disability as there are no social – economic studies aimed at this group of people. The National Statistics Institute (INE) tries in any way, to count the number of people with disability but presents lacks in their study. The 2001 Census helped to understand in which type of universes do this people live, in Portugal, presenting several variables, such as the number of people with disability, employability rate, education level, etc; but regarding to their economic power there is not any information.

In the 2011 Census, the “type of disability” variable, observed in 2001, is replaced by the “type of incapacity” variable, and according to INE, it was intended to adopt the new conceptual framework of International Classification of Functioning, Disability and Health (ICF). Therefore, 6 functionality domains are observed through the assessment of the degree of difficulty that the person presents (self-assessment), in a daily basis, in the accomplishment of certain activities due to health problems or age-related (ageing) – in order to considering the existence of difficulty, it should exist at least 6 months. The recognized difficulties are: difficulty to see even if wearing glasses or contact lenses; difficulty in hear even if wearing a hearing aid; difficulty in walk or climb steps; difficulties with concentration and memory; difficulties in having a bath or dress himself; difficulties in understanding others or be understood. The difficulty will be classified accordingly to the following scale: has little or no difficulty, has a great difficulty, is not able to. Regarding to the building, were registered observations to the accessibility of individuals with reduced mobility and accessibility of individuals with reduced mobility in the inner common areas [4].

Despite of the importance of these new data, the Census 2011 results about population’s incapacity have not been revealed yet, by INE, thus, we will analyze the results of the previous Census, from 2001, on order to create a framework of the reality of people with disability, in Portugal and whenever possible we will update the results with the data presented. Outlined below is the possible characterization of the Portuguese population with disabilities.

3. Characterization of Portuguese population with disability based on available data

The exact numbers of people with disability it is unknown, because it involves several incapacities or even disabilities which we cannot count and several countries do not have this statistic research. However, it is estimated

that exists 600 million people with disability worldwide. In Europe, the European Commission counts 50 million people with disability. In Portugal, in accordance with the WHO, the number reaches over one million [22].

According to the statistic data from INE (Census 2001), Portugal had a total of resident people of 10.356.117 [23] this number changes with the preliminary results from Census 2011, till March 21st 2011, Portugal has a total resident population of 10.555.853. In the last decade, it was registered a positive evolution in the population growth dynamics, in 2% (1.9% total) in the resident population [24].

3.1 Resident People with disability

In the Census 2001 (last data available at the moment), made by the National Statistics Institute (INE), were counted 636.059 people with disability [23] slightly below the number provided by WHO [22]. The resident population with disability indicator by local of residence (Continental and Islands), with at least one type of disability, is about 6.1%.

In Table 1, are registered the resident people with disability by type of disability.

Table 1. Resident Population with disability (No. and %) by type of disability

Total	Hearing Impairment	Visual	Motor	Mental	Cerebral Paralysis	Other Disabilities	
636.059	84.172	163.569	156.246	70.996	15.009	146.069	Nº
100	13.2	25.7	24.6	11.2	2.4	23	%

In this table, we can see that almost 40 % of the total of people with disability is related to the sensorial level (visually impaired and hearing impairment), indicating a significant difference between the two types: visually impaired almost doubled the hearing impairment. Regarding motor disability, with 24.6%, it is placed in second, followed by “Other disabilities” which represent 23% of the population with disability. The group entitled as “Other disabilities” considers diseases like dyslexia, renal insufficiency, dwarfism, hemophilia, lupus, aphasia, mutism, voice limitation, laryngectomy, gigantism, ostomates, def-blinded. The disabilities which have the lowest percentage are: the mental disability with 11.2% and the cerebral paralysis with 2.4%.

Note that there is no specific group for people with intellectual disability. The groups which show more affinities are the mental diseases and cerebral paralysis, due to their characteristics but others disabilities that should be in the group of people with intellectual disabilities are scattered in others disabilities as dyslexia. According to the INE’s own definition, the Mental disabled people group includes people “with a soft, moderate, or profound mental disability or with other development problems, translated in a intellectual functioning significantly below the average, notable from young age. It does not include severe psychotic or degenerative diseases, inside the psychiatric or mental perturbations general classification, frequently designated by “mental disease” [23]. The cerebral paralysis group includes the individual that presents: “limited movements in the affected body zone areas; uncontrolled and uncoordinated movements; balance and coordination problems, although they can walk; verbal expression affected” [23].

3.2. Active Population with disabilities

According to INE, in a total of 6.1% in population with disability, that can work, the employment rate amongst resident population with active disability is estimated at 90%. It is noticeable that there are differences in the employment indicator percentages for the different types of disability; therefore we present the following table 2.

Table 2. Population with disability by type and condition regarding the economic activity (2001).

(Data Source: INE - X till XIV Census; Source: PORDATA; Last Update: May 11st 2010)

Type of disability	Total	Employed	Unemployed	Without an Economic Activity	Total Population with Disability
Hearing Impairment	80.356	23.790	2.518	54.048	601.583
Vision Impairment	153.053	59.844	6.152	87.057	
Motor	151.736	31.094	3.008	117.634	
Mental	66.092	5.701	1.019	59.372	
Mental Paralisys	12.582	859	125	11.598	
Other Disability	137.764	36.370	3.813	97.581	

In table 2, we can observe that in a total of 601.583 people with disability, the group of people with mental paralysis and mental impairment are the deficiency groups with less people employed. We notice that the motor impairment group is the group that has more people without an economic activity. The hearing impairment group, presents a total of 80.356 people, have 23.790 people employed and only 2.518 unemployed but there are 54.048 people without an economic activity.

Comparing the resident population and the resident population with disability, we know that in 2001, 57.4% from the total resident population represented the work force in our country. 29 % of the population with disability was economically active and the major part was employed [5]. From the non-active population, the total resident population is 42.6%, however, the “retired or in the reservation” category was indeed the majority. In the group of people with disability, 71% were economically inactive, but the higher percentage was in the same category as the total resident population, 42.2% were “retired or in reservation” and 18.5% were “permanently incapable to work” only 3.2% were “students”, 3.5% domestic [5].

3.4. Internet and People with disability

We will consider the population’s global data in order to present an overall analysis of the national scene, due to the fact that there is not information, in our country, related to the use of digital technologies – Internet and mobile devices – by people with disability. We will also, verify the importance and the evolution of the use of these devices in accessing the digital world, anticipating economic problems with the loss of clients with disability due to inaccessible contents.

With the emergence of the new media (internet) and with the evolution of the old (mobile phones), it is believed that they are important tools for the aid and the development of the people with disability. With this conviction we did an analysis of the evaluation of the growth of people using these communication tools.

According to the International Telecommunications Union (ITU), the internet has, actually, 2 billions users worldwide. When compared with the 2000 data, which were 250 million users [25], we assist an increase of 1.750 million, 75% in approximately 10/11 years.

The ITU evolution study of the use of the internet, in Portugal, in the period of 2000-2010 demonstrates that in 2000, 2.500.000 of 10.318.084 persons (24.2% of the population) used the internet and in 2010, 5.168.800 of 10.735.765 persons (48% of the population) used the internet. This evolution can be observed also for the services provided by public institutions, as for example the INE, regarding to their new census internet service. Accordingly with data provided by the institute, 50% of the resident population uses this service [23].

Regarding mobile networks, we verify that, in the year 2000, in Portugal, there were approximately 7 million subscribers of mobile phones services. In 2009, this number exceeded the 16 million users (16.100.000). In 9 years, there was an increase (more than double) of 9 million. At a worldwide level, in the beginning of 2011, were counted more than 5 billion subscribers opposing to the 700 million in 2000. In 10 years, there was an increase of 4.500 billion subscribers [25].

4. Other important data (not possible to collect)

In Portugal, we verify that the existing data to count the number of people with disability is very low and during the investigation it was not found any analysis about the use of internet by these people or market studies integrated in corporation’s business plans. Therefore, in this section we want to emphasize the missing data to make a global study of people with disability in Portugal.

The previous Census (2001) was very vague in some questions, and we thought that the next ones were correcting the lack of information, but the way they were defined does not allow filling the gaps [26]. The main omissions explain the universe of people with disability in Portugal and its framework, if any Portuguese has disability and which kind of disability. Specifically:

- ∞ It does not differentiate people with disability and “people whose fragility brings a sort of limitations”, meaning, people that lost the capacities due to age, as for example, visually, mobility, audition, etc. [26].
- ∞ The questions are aimed to some types of disability and for the elderly. For example, it asks if they have difficulties in hearing, but it is not a disability or limitation age-related; it asks if the person has difficulties in seeing, but again it does not differentiate if it is a disability or a limitation age-related [26].
- ∞ They leave beside the organic disabled [27], whose disability it is a consequence of some intern aspect of the body: these renal patients, hemophiliacs or diseases derived from oncological diseases. These people, in Census 2001, belonged to the category “Other disabilities” like dyslexia, which for example belongs to intellectual disabilities.
- ∞ It only question about the level of difficulty of some people in the accomplishment of some tasks due to health problems or ageing and does not question about disability (question 10 in the survey) [28].
- ∞ There is not a question about accessibility in the house.
- ∞ Regarding to employment, it is not possible to evaluate how many people with disability are employed, unemployed or have not any type of income, because being considered “fit for work” and have not managed to get a job, do not entitled them the right to any kind of social support. We also do not know how many live in institutions.
- ∞ Finally, according to the surveys which are going to be used, they do not allow to identify a certain type of disabilities, as for example the intellectual disability.

Thus, it was lost another opportunity to use this census tool to clarify the true reality of our country regarding to this group of people. Invariably, we got below the expectations when compared to different European countries. These countries have already a great sensibility in handling these data, as England, which studies the economic value of this group in society.

Briefly, in order to achieve a precise study to calculate the economic potential of people with disability, we would need information about: which type of professional activity do they have and the respective basic monthly salary; employability rate; which are the disability subsidies in Portugal for these group of people and which are the subsidies amounts per age and type of disability; in which kind of families are they integrated, which disability subsidies do these families receive and which amount per age and type of disability; average use of emerging technologies, as the internet and mobile devices, which devices are used to access the digital environments, time spent per day in those environments, which type of platforms do they use (social, commercial, entertainment, etc.)

5. Analysis and discussion

There are about 600 million people with disability worldwide [22]. Therefore, 1 in each 6 persons is a potential consumer or client. The digital businesses need to be accessible to people with special needs witch along with their services and care providers represent a very significant economic part of the population [29].

Only in Portugal this group of people consists in 6.1% of resident population, appearing to be a low percentage which does not economically justifies that much effort, spending and costs to transform the contents into accessible. However, a potential increase in sale of 6.1% is not that insignificant. It is not only in question the purchasing of a product in a digital environment (electronic commerce), but, and above all, the physical purchase influenced by an online experience. And more, this universe of clients can grow because this number (6.1%) is related only to people with disability, in Portugal they are not the only ones needing accessible digital environments. The elderly people and the ones with temporary incapacities also belong to the group with special needs. Concluding, this number claims the development's effort of these environments and compensates proportionally to the inclusion that previews.

In a total of 6.1% in population with disability, the employment rate of people with active disability reaches over 90%, according to INE data.

If we observe the estimative of employed people with disability (table 2) and think that the national minimum wage is 485 euros per month, then we can estimate that an employed person with disability can earn (minimum wage) 5.820 euros per year. If we add up all employed people from the different disability groups (hearing impairment, motor, visual impairment, mental, mental paralysis and other disabilities) we will have 157.658 employed people with disability and multiplying the national minimum wage we will have 76.464.130 euros per month. On an annual basis, there is an estimative of 917.569.560 euros per year and this number can be seen as a potential purchase power of this group of employed people with disability.

Besides the information on the number of employed people with disability we have also information about how many people with disability are unemployed and/ or do not have any economic activity. Do not these people represent any potential of the economic power?

We know that this group has access to unemployment subsidies (which we do not dare to estimate once we do not have any variable to determine which is the unemployment subsidy for each (or average), as this would imply other variables, as for example, to know the real salary of each one.

According to social security information, people with disability that find themselves in this economic situation are entitled to receive subsidies through the general social security system. In this area there are some support subsidies for people with disability, which can or cannot differ depending on age, such as:

- ∞ The family allowances bonus for children and youngsters with disability. This amount vary from 59.48 euros, for children and youngsters until 14 years old, from 86.62 euros for youngsters aged 14 - 18 years old, until 115.96 euros for youngsters aged 18 - 24 years old, with an increase of 20% in single parent families;
- ∞ The special education allowance differs according to the school's institution and the household income;
- ∞ The monthly life annuity, which presents a fixed amount of 176.76 euros;
- ∞ The social solidarity supplement, which differs according to age, pointing out 17.56 euros for people under 70 years old and 35.06 euros for people with 70 years old;
- ∞ And the allowance for care provided by a third party represents a fixed amount of 88.37 euros [30].

Therefore, it is known that 71% of people with disability are economically inactive, unemployed or without economic activity. This group of people can receive per month, social supports or social security subsidies, if we take under consideration this data we can possibly do a balance of what they could receive of the supports mentioned above.

Thus, 42.2% of people “retired or in reservation” adding up 18.5% people “permanently incapable to work” and 3.5 % people “domestic” results on a total of 71% of 443.925 of the population economically inactive (approximately 315.187 individuals) might received two subsidies of the social security, the monthly life annuity worth corresponding to an amount of 176.76 euros and the social solidarity supplement 17.56 euros or 35.06 euros which gives a total amount between 194.32 euros to 211.82 euros per person per month. 315.187 people per month might be received in these two subsidies between 61.247.137 euros and 84 cents and 66.762.910 euros and 34 cents per month. On an annual basis, this amount varies between 734.965.654 euros and 801.154.924 euros.

Only 3.2% of 443.925 people economically inactive were “students” this group of people can receive the family allowance bonus, an amount that varies between 59.48 euros, 86.62 and 115.96 euros with an increase of 20% in single parent families. And also a special education allowance but this value is not possible to calculate because depends on the school's institution and we do not have does data.

With this specific data above described we can indeed demonstrate a potential amount of money that digital companies are losing in a monthly and annual basis ignoring these potential consumers. Even with these reflections do we still think that is a group economically unviable for the digital businesses? Note that these reflections are about how much money are digital companies losing by not making accessible digital businesses.

6. Final Reflections

Nowadays, the internet users (which will be the elderly internet users of tomorrow) experts in technology, will not content themselves with simple contents; will be also demanding, in a technological perspective. They will not be simple users, but will be in a certain way, developers of their own content, due the emergence of new technologies such as the Web 2.0 which focuses on interaction. In this line of thought, we also know that with ageing we became more susceptible to special needs and also disabilities.

To create a better online experience implies a premise to who works for a global internet. Theoretically, to provide an easier access and the use for some people is to provide easier access and use for all. The responsible for the e-commerce websites should not only be worried about the statistics of their sites, but equally understand who their visitants are, which products are of their interest or how they access those products. The web accessibility is important because in the website statistics, the users with disability are counted as a “normal” user. There is no way to know if there is or is not any user with disability using the website. By not thinking in web accessibility and not investing in this public indicates a lack of strategic vision at an economic level, because it could be a very significant client basis. In general, the purchasing power of people with disability depends on the country where they live or work, and due to this fact it is necessary to know this group economic and social situation.

So after great expectations to analyze the Census 2011 preliminary results, it is verified, as referred before by the president of the Portuguese Association of People with Disabilities (APD) Humberto Santos, the approach to the disability theme was below expectations in this Census. Through the analysis of the national census surveys, it is confirmed that, unfortunately, the questions ignored this theme. The effort in the elaboration of a census action, as well as labor and economic, it is considerable. Therefore the knowledge should be maximized by approaching each theme that matters to the country for an adoption of measures and politics aiming to stop the discrimination and isolation of these citizens [26]. By not questioning about the reality of the people with disability, some variables information is restricted, which turns a possible globalizing analysis of a country into an imprecise perspective about citizens with disability and the specificity of their disability.

In order to know Portugal's social and demographic universe it becomes necessary to create census activities which include all the necessary aspects indispensable for the characterization of a population. The Portuguese Movement of People with Disability (Movimento das Pessoas com Deficiência) has claiming this kind of actions, which allows describing people with disability in capital aspects, already mentioned before.

One of the biggest problems is that in this Census 2011, there wasn't any participation of organizations which represent people with disability, which is a barrier in order to have a precise knowledge about the social and demographic reality of this people [27]. As Humberto Santos stated *"The INE has chosen not to hear the disabled people organizations, when elaborating the survey questions and the result is a survey with vague and uninteresting questions, which have as basis the medical model of disability. This model was ignored by the WHO's International Classification of Functioning, Disability and Health. The connection between the disability limitations and the ones imposed by the environment were not included in this survey"* [26].

It's extremely necessary a global effort in order to accessibility becomes a reality and not only a concept, a trend, so that we can live in a real inclusive and digital world.

As future work we intend to calculate the actual economic power of Portuguese people with disability as they already do in other European countries.

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