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The State of Informatics in Portugal

José Cardoso de Matos

This article is based on a paper published in APDSI (the Portuguese Society for the Development of the Information Society) which aimed to launch a discussion on digital discrimination and the digital divide in Portugal. The author examines the current situation and the underlying social and economic issues that lead to digital exclusion, and provides some options to overcome these issues in the future.

Keywords: Development, Digital Discrimination, Digital Divide, ECDL, Economy, Education, ICT in Portugal, ICT Skills, Information Society, PROFIN.

1 Digital Discrimination: Myth or reality?

Digital discrimination results from economic, social, educational, cultural and political factors that lead to different levels of participation in the information society.

It is clear that digital discrimination is a direct consequence of economic exclusion as people with lower incomes have more difficulties in acquiring equipment and services and paying for Information Technologies (IT) education and training- all factors that limit their access to the benefits of the Information Society. But we must also realise that digital discrimination can be a result of political, cultural and social motivations, which can leverage the negative impact of the economic factors.

Understanding this issue is fundamental if we are to create the basis from which to effectively fight the roots of digital discrimination. It is not enough to act on the economic front, important as it may be, as it is not enough to have a computer and Internet access. If people do not have the skills to use the tools in an effective way and if complexity is still prevalent in accessing the information, there will always be barriers preventing people grasping the benefits of using IT as a means for full participation in the information society.

Once created, digital discrimination also contributes to generating economic, cultural and political exclusion. This is even truer since we live in an increasingly online world and digital discrimination has a linguistic side that we cannot ignore despite the growing presence of Portuguese in the digital world.

It is a circular phenomenon that needs to be broken. By reducing digital discrimination we can reduce the economic exclusion that can, in turn, lead to a further reduction in the digital discrimination.

Digital discrimination creates a situation of exclusion from the benefits of the information society for many people on the wrong side of the digital divide. The reality of a situation of info-exclusion, or e-exclusion, for a large part of humankind, arises not only from social and economic discrimination, but also from cultural and political discrimination.

At a time when the importance of e-Government initia-

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tives is emphasized as a means of facilitating citizens' lives and making public administration more efficient and transparent, it is vital to take into account the fact that the fight against digital discrimination must be considered to be a democratic imperative, fostering citizens' equality of access to public services.

By not considering the importance of this phenomenon, we risk increasing the political, social, cultural and economic discrimination and creating obvious situations of inequality of opportunities among citizens, thus challenging some of the principles of the democratic system. With this in mind, it is vital that politicians understand the importance of the fight against digital discrimination, lest we increase even further the digital divide, creating a deeper gap between those who have and those who have not full access to the information society.

In this context, the concept of digital literacy is paramount to understanding the benefits full integration in the information society, resulting in true equality of opportunities amongst the citizens of the world and a true participation in what we might call e-democracy, a phenomenon that is gaining importance, sometimes without everybody being truly aware of it, but which represents an unstoppable evolution that cannot and must not be ignored.

Digital discrimination exists as a frightening and sad reality, even when partially hidden in the impersonal and unclear figures of computer penetration per "x" inhabitants.

2 Digital Discrimination and Digital Divide

The digital divide has been defined as the gap between the individuals, groups and companies that have access to information and communication technologies and those who have not. It represents the disparity between those who benefit from digital technologies and those who do not have access to its benefits, those who participate in the information society and those who are left out of it.

It is important to note that the digital divide results from an unequal evolution process that, according to Jakob Nielsen [1], has 3 stages: economic, usability and empowerment. These 3 stages are in reality, and perhaps more correctly, 3 sides of the digital divide considering that they co-exist simultaneously. They are also perceived differently, which leads to different levels of intervention.

The economic stage is the easiest to understand and has been considered by many, to be the only cause of the digital divide, which has led to the fact that many policies aimed at overcoming it have been limited to providing hardware. This is easy to measure and as such politically more attractive, for example by the number of personal computers (PCs) per thousand inhabitants, the Internet penetration in homes or even more updated indicators, such the number of broadband Internet accesses, both fixed and mobile.

The usability stage, which we could also call the literacy stage, is more difficult to grasp, though it is a key issue in the digital divide. As we can easily understand, it is not enough to have computers and Internet connections if their users do not know how to benefit from them. Increasing the number of children using computers to play is important, as it makes them familiar with the hardware, but it does not contribute to enhancing their learning capabilities or to show-

ing them the benefits of the Information and Communication Technologies (ICT) for increasing their knowledge scope or to stimulating their curiosity to learn. We must bear in mind that digital literacy, as in the case of the alphabetic literacy, is not restricted to the basic uses of ICT; it only reaches its full potential when we have the capacity to use the means and tools provided by digital technology and understand the contents they can deliver.

Finally, the empowerment or participation stage presents an even bigger challenge, as inequality of participation generates a gap which is difficult to overcome. It relies not only upon the individual's access to the means, the knowledge and the skills, but also upon the will, availability and motivation to overcome the digital divide. And here the notion of user-friendly, particularly when related to software applications and websites, plays a key role in user motivation. To stimulate a larger participation of all members of a particular community is a growing challenge that we must be aware of, particularly when those communities tend to be increasingly virtual and not restrained by physical frontiers.

3 Current Situation in Portugal

If we take European statistics into account (Figure 1), we can see that Portugal is, according to indicators, surprisingly well positioned on ICT penetration.

However, when we look at the indicators in more detail, for example the number of households with computer per region, we can see that only 50% have a computer. Lisbon is clearly the region with a highest level of penetration, with the Algarve and the Islands coming close in recent

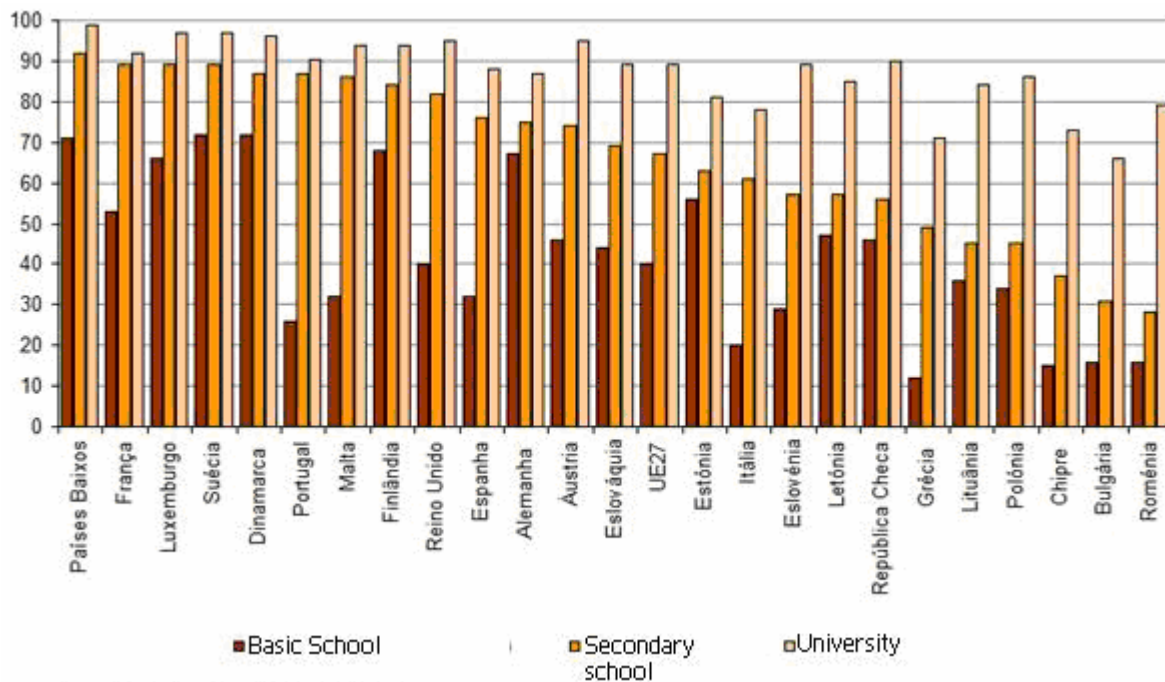


Figure 1: Percentage of Internet Users by School Level in the European Union member states, 1st Quarter 2008: Individuals between the ages of 16 and 74. Source: Eurostat.

years. Although this evolution shows an improvement in digital discrimination between regions and a more level playing field, it doesn't say much for the improvement in the already more digitised regions. On Internet penetration rates for households, although these are quite similar to the computer penetration rates, Lisbon is clearly ahead of other regions.

The Enquiry on the Household Use of Information and Communication Technologies 2002-2008 held by the Portuguese National Institute of Statistics and Knowledge Society Agency (INE/UMIC) found that, of the households without access to the Internet, the key motives indicated were: no interest/utility; **doesn't know how to use**¹; and the high cost of equipment and access. Much to our concern, this is a reality that still exists.

A more detailed analysis of this Enquiry provides additional information that shows a disturbing existence of a generation gap in the use of computers and the Internet. This discrimination is a reality that must be taken into account if we don't want it to contribute to being a source of economic and social exclusion.

4 Future Perspectives, Foreseen Evolution and Barriers

In an economic environment of *laissez faire*, i.e., without adequate policies to fight the economic exclusion, digital discrimination has a tendency to increase.

It is important to consider that the economic, social and technological revolutions at the core of human development, have also contributed to increase the inequality due to the asymmetric development they generate. If we take the industrial revolution as an example, due to its historical importance, we can easily see, as David Landes pointed out, that "*the industrial revolution put the world closer together, making it smaller and more homogeneous. But the same revolution fragmented the globe, separating the winners from the losers*" [2]. The same could be said of the digital revolution, only here the inequalities were further amplified by the fact that change occurred at a much faster pace, making it more difficult for an increasing number of people to adapt to the new paradigms. In reality, we can also see that the separation between the winners and the losers, between those who have and those who have not access to the information society is increasing. We could even say that more important than change is the speed of change, which is leading to a bigger divide and increasing digital discrimination.

Considering the fundamental connection between economic exclusion and digital discrimination it is in this area that a wide ranging intervention is likely to generate a higher potential for short term results. It is thus of the utmost importance to implement policies that can break this vicious circle (economic exclusion that generates digital discrimination that leverages a bigger economic exclusion) turning

it into a precious circle of growth.

For this, it is vital to create a set of objective stimuli for the adoption of actions leading to a wider use of the information and communication technologies. These should cover both the equipment and the training of its users, thus allowing for real benefit from the use of those technologies.

The evolution of business models leveraged by the digital revolution is reinforcing the role of innovation in the structure of more efficient value chains and on the development of value networks where the core enterprises become the centre of virtual organisations, and where the use of ICT is a key competitive advantage.

The implementation of these innovative business models requires a level of knowledge and skills in the use of technologies which are not compatible with traditional teaching models. This must lead to a reformulation of the educational paradigm, as the only way to ensure the conditions for a true economic integration and active participation in the information society for all.

5 Fighting Digital Discrimination

5.1 Challenges and Measures to Fight Digital Discrimination

Digital discrimination is at the origin of a number of challenges for society, its institutions, and for people. Digital discrimination is at the source of a digital divide that fosters info-exclusion and increasingly a social, political and economic exclusion of a sizeable part of the population, as social, political and economic institutions migrate to digital solutions.

The main challenges of an effective fight against digital discrimination pertain to the following areas of intervention:

- Reducing and gradually overcoming economic exclusion.
- Reducing the differences in education and access to ICT.
- Fostering training in ICT.
- Avoiding the discrimination of small and medium enterprises (SMEs).
- Simplifying the application processes for European Union (EU) funding.

To overcome these challenges, we propose a number of measures to address the core problems, very much centred in pragmatic programmes that will allow for short term results in critical areas for the fight against digital discrimination.

5.2 Reducing and Eliminating Economic Exclusion

Economic exclusion is a primary source of discrimination in accessing ICT, in terms of both equipment and training and education. Reducing and eliminating its effects requires a certain number of policies aimed at that objective. And here it's fundamental to have the end in mind and not confuse it with the means. The end that we aim for is to

¹ Highlighted due to its relevance.

broaden the access to ICT to all citizens, regardless of their economic means. The measures to achieve this should thus facilitate access for lower income families.

It is fundamental to consider here that the end is not to provide financial facilities for the acquisition of computers by those families, and the same could be said of Internet access at cheaper rates. The end is to ensure that those families have access to the benefits of the information society through the proper use of ICT. To achieve this, being able to have computers and Internet access at lower rates is fundamental, but not enough. It is a means to reach an end and not an end in itself, lest we foul ourselves with statistics that are "nice for the picture" but contribute little to either decreasing the digital divide or increasing the opportunities for those who are in the wrong side of that divide.

It is thus essential that granting the financial means for the acquisition of computers and access to the Internet be preceded by an adequate training of the potential users, and accompanied by positive evaluation. Society has a duty to integrate all its citizens, but it also has the obligation to ensure that the support it delivers is used in a way that effectively achieves the intended objectives. Would it make any sense to subsidize the acquisition of automobiles to citizens who do not have a driving licence, or the means to obtain it?

But it is possible to develop and implement a simple and pragmatic programme. Why set up national programmes, coordinated by heavy structures that tend to be inefficient and expensive? Why not opt for a voucher system that people can use for their training? Naturally, this would have to be within certain parameters and a used in accredited training centres. The risk of forgery and scams can always be lowered to a controllable level through the use of technologies that are already available.

Finally, it is important to mention open source software and the important potential of its widespread use as a means to fight the influence of economic exclusion in digital discrimination.

5.3 Reducing the Differences in Education and Access to ICT

This is an area where a lot has been done in the last few years and where we can see significant improvements, but here again it is important not to confuse the ends with the means to achieve them. The *e-schools* programmes have a very important role in providing easy to access computers and the Internet for all pupils in primary and secondary schools. It is now fundamental to ensure that the use of these means is productive and effective.

In training at schools is very important to ensure that, from entry level, there is a concern about ethics and safety in the use of ICT and that appropriate content for each age group is used, as well as the provision of technical aids for children with physical impairments.

The implementation of technological infrastructures and equipment in schools has allowed the creation of a national network that can also be used effectively to fight info-exclusion in the Portuguese population, through focused pro-

grammes aimed at the local needs of the population and of the companies where those schools exist.

5.4 Fostering Training in ICT

Training is one of the key areas in the fight against digital discrimination and reducing the digital divide, particularly in the adult population where the biggest gap is to be found.

But here also, it is fundamental that we take a pragmatic approach aimed at what we want to achieve: eliminating the digital divide. And this cannot be achieved by accounting for training hours in ICT; this can only be achieved by ensuring that all users know how to employ ICT in an effective and productive way.

If we want to fight effectively against digital exclusion and prevent the digital divide from widening, we need to concern ourselves with what really matters and avoid the temptation of using the number of training hours as a measure of success. The number of training hours is not an end in itself, merely a means of allowing us to learn how to use the ICT. That's why it is fundamental to ensure that all ICT training is validated through international standards. Imposing a level of quality in training through an internationally-recognized certification that validates the knowledge and skills obtained, such as the ECDL, ensures that there is effective management of the funds provided for training and provides a guarantee that they contributed to ensuring that the trainees know how to use the ICT effectively and productively.

The aforementioned use of vouchers for training could be another way to ensure that the training systems become more efficient and effective, by setting standards of quality that only open competition can provide. Naturally these vouchers could only be used in approved courses in accredited centres, to ensure that they have a minimum level of quality and are subjected to an audit of methods and procedures.

With this option, we could avoid the unfortunately very common situation of training centres with approved courses for funding having to search for trainees. Training must be adapted to the needs of the citizens and the companies and not to the needs of the training centres, which exist merely to provide service for those same citizens and companies, and not to have an autonomous existence, frequently subsidized.

The use of schools outside of the school hours for training geared to adults and the unemployed could also be envisaged, in a way that does not distort the market, but that allows them to fulfil a social function and optimize the investments made.

5.5 Avoiding Discrimination of SMEs

Bearing in mind the importance of SMEs in the Portuguese economy it is fundamental to ensure that ICT allows them to reach highly competitive levels.

Amongst the measures that can be implemented to increase the use of the ICT in SMEs we could include train-

ing programmes in the ICT, using some of the ideas above, and fiscal incentives geared towards simplifying the processes that allow, for example, companies to charge as costs all investments in computer equipment, both hardware and software, up to a certain value. This would provide them with an immediate fiscal incentive and a simplification of accounting procedures.

Other measures could include the setting up of innovation centres for SMEs that leverage the development of informatics solutions specifically for them.

5.6 Simplifying the Application Processes for EU Funding

EU funds are an important source of financing and support to projects of corporate modernization. The complexity of the processes to obtain those funds, the time required for analysis and the delays in making the funds available are not in line with the needs of the companies and with their capability to face the challenges of a global and increasingly competitive economy. And not even the slowing down of the world economy changed this framework; on the contrary, it is becoming more difficult for companies who cannot adapt rapidly to the structural changes.

As there are numerous cases of good practices in this area, it is vital for the State to set an example by promoting the dissemination of those good practices and expedite the migration of procedures through all government departments that handle EU and national funds.

6 Conclusions

The main objective of these measures to fight digital discrimination is to decrease the digital divide to enable, in time, all citizens to enjoy the benefits of full participation in the information society.

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