

# An e-gov service for retirement applying by illiterate and disabled people

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## ABSTRACT

This paper describes an e-gov service that provides a mean to require urban or rural retirement benefits. It also discusses its usability and accessibility in order to assist disabled and illiterate people. The conception of such service has been motivated by the identification of the major needs among the portion of Brazilian people who is digitally excluded and whose functional or plain illiteracy levels are significantly high. Furthermore, the percentage of people with visual or hearing impairments at retirement age is higher than overall population average. Such characteristics should be taken into account when designing interfaces which can be easily used by people with low literacy levels or visual or hearing impairment. This paper also describes the mechanisms for user identification and the assistive technologies employed in the design for providing autonomy to its target public.

## Author Keywords

User Interface, e-gov Service, Illiterate People, Elderly People, Sensory Disabilities, Digital Divide, Retirement.

## ACM Classification Keywords

Graphical User Interface, Screen Design, User-centered design.

## INTRODUCTION

We present a new electronic government service, which integrates in one place, only, the majority of information and forms required for retirement request [1]. Those forms together with personal documents will be delivered at the Brazilian Social Security System office (INSS – Instituto Nacional de Seguro Social). Such e-gov service may reduce the number of visits to the INSS office by people eligible for retirement, making those procedures simpler, specially for those who live in towns without INSS office.

The target public for the service is composed by rural and urban workers who need to obtain their retirement through Social Security System. These workers are mostly elderly people and may be completely or partially illiterate, have some visual or hearing disabilities or even just be digitally illiterate.

Two factors motivated the creation of such service: 1) the identification of the target public needs which are those concerning mainly illiterate elderly people, and 2)

the socio-economic importance of Brazilian Social Security System.

The digital divide, or the constraints to access the information and communication technologies (ICT), due to educational, psychological or socio-economic barriers is the current condition of a great amount of Brazilians. Furthermore, visual or hearing impairments and complete or partial literacy deficiencies limit the access to technology, thus comprising some of the main barriers to the use of computers and Internet [2]. These characteristics are more usual among people over 60 years old, which is the average age to request for retirement benefits.

Within rural population, which corresponds to 19% of total Brazilian population, or 32 millions of people in 2004<sup>2</sup>, around 55% of the rural households had a monthly income of approximately just two minimum wages<sup>3</sup>. In 2005, for the approximately 96 millions of Brazilian workers, 19 millions worked in the agricultural sector.

Due to the low income of the majority of Brazilian workers, the income received from retirement benefits has an important impact on the families, especially those who live in rural areas, where the retired citizen is the main provider. In Northeast, a poor Brazilian region, the main source of income is from retirement payments to the workers, whose benefit represents 50% of the total income of almost all households [3]. For those reasons, the retirement payments plays an important role for reducing the poverty and the income inequality in Brazil [4].

The development of an electronic service for solicitation of retirement must take into account the profile of the majority of its target market. The illiteracy rate among people who live in urban areas is 10% and for people who live in rural area it increases to 28%. In addition, about 20% of the population is partially illiterate. This number rises to 54% if we consider only people in retirement age, the target public of the service

<sup>2</sup> The data related to Brazilian population mentioned in this article were extracted from IBGE (Instituto Brasileiro de Geografia e Estatística).

<sup>3</sup> Nowadays the Brazilian minimum wage is around US\$ 190,00.

proposed. Furthermore, in this group, 34% has visual and 18% some hearing impairments. Additionally, the portion of Brazilian population whose level of instruction is lower than three years of study reaches 32%. Considering only workers at retirement age, that portion goes to 54%. In the case of rural workers eligible for retirement, this parcel increases even more, reaching 81%.

In association with the socio-economic importance of retirement benefits, the evidences on Brazilian population needs impose a great challenge to the conception and development of this e-gov service: to create an interface with high usability and accessibility to its target public. It is important that such interface enables any illiterate or people with visual or hearing impairments to use the service without assistance. This service counts on its features to make it possible and that should be its great differential when compared to similar services.

### **CURRENT PROCEDURES FOR THE ACQUISITION OF A RETIREMENT BENEFITS**

In order to obtain any kind of retirement benefit from Brazilian Social Security System in present days, the workers should go to an INSS office and ask for information and the required forms. Then, they must return to the INSS office in order to deliver the filled forms and a set of documents that prove their identification and fulfillment of all the requirements to receive the benefit. After delivering all documents, the worker has to wait about 40 days for the process conclusion.

The main barrier of a retirement applying is the understanding of the information presented by the INSS. There is a great number of persons with low literacy or some sensory impairment and the style of the written information is highly technical. In addition, in a considerable number of cases, it is difficult to collect documents with evidences of the number of working-years requested for retirement, especially for rural workers, usually not registered. Besides, until all required documents are complete and correct, it is possible that the worker has to return to the INSS office several times.

The effort of the worker to deliver all required documents may be expensive, specially if there is no INSS office in the city where he lives. It is known that only 20% of the Brazilian cities have an INSS office.

At the INSS Internet site it is possible to obtain information about many social security services as well as to download forms and track the processes status. However, as the case mentioned above, the excess of formal and technical language imposes a barrier for understanding those information, especially for those with low literacy.

### **SERVICE FEATURES**

The service purpose is to support both, urban and rural workers, offering them automatic tools to simplify the Social Security retirement applying.

Most of the information about retirement application procedures is available in official government Internet sites but it is spread across different sites and use a complex language to be understood by most of people, even by literate persons. Furthermore, sometimes it presents contradictory information.

Our e-gov service offers an integrated information system that supports the workers during requirement and tracking processes.

It innovates in presenting information using a language and interaction models appropriated for illiterate people or people with visual or hearing impairment. Depending on the user, appropriated interfaces will be presented considering his profile, by using assistive technologies such as screen readers, touch screen, command voice, audio and sign language videos for people with hearing impairment.

Through this service, the user will be able to access information about different kinds of retirement, eligibility rules, documentation required and institutions responsible for issuing such documents. That information will be available in a understandable language for the user.

Many documents are demanded by the retirement request and the system will provide support for getting them by offering an electronic documents check list, giving information on how to obtain them and, also, communication tools for contacting the institutions responsible for issuing them. Sometimes, special forms are required for applying the retirement benefits. In that case, the service will help the user providing the necessary forms and supporting him to fill them.

After reaching the eligibility rules and gathering the documentation, the user must go to a social security office to apply for retirement benefits. The service will allow the user to track the progress of his process and to update his data, for example an address change.

### **PROCEDURES FOR APPLYING FOR RETIREMENT BENEFITS USING THE SERVICE**

In order to use this service, the user must go to a telecenter (Internet access point) or kiosk, located in public places easily accessible for the target audience, such as rural schools and commercial areas, thus reducing the distance and time travel from and to his house.

The user will access the service after an automatic identification of his profile by the system, which includes the identification of type and degree of user's sensory disability or level of literacy. Furthermore, the user may register himself in the system. In such case, the authentication will be made by means of biometric data. Figure1 illustrates the main functionalities of the service.

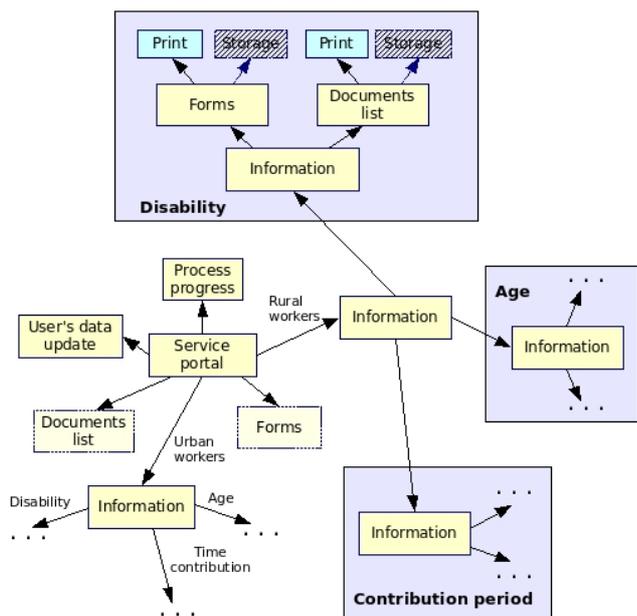


Figure 1 – Retirement service diagram.

Through the service, the user will be able to get all the information about the procedures for applying for retirement benefits without going to a social security office, usually not present in all cities, as mentioned before.

The service supports the user to get the required documents by instructing him on how to contact the institution responsible for the document emission (person of contact, e-mail, telephone and address) and, on how to obtain the document. Furthermore, if necessary, the service provides communication tools based on text or voice so that the user can contact different institutions and ask for more information related to the documents.

In the particular case of rural people who have worked in more than one city, this service may be especially helpful because they must get a declaration from the rural labor union of each city confirming their rural activities during an specific period of time. This new service could avoid a journey to each city to obtain a declaration from its rural labor union.

**USER IDENTIFICATION**

The user interfaces play a crucial role for the acceptance of the service by its target public. Whilst the access terminals are the equipment employed by the users to access the system, the interfaces offer the capability of an effective interaction by exchanging visual, audio or tactile information.

Beyond technical aspects, the interfaces enclose social, cultural, cognitive and subjective aspects of the user. They will employ a language and a model of interaction that favor the establishment of a communication between the system and its users. They are being adapted to the level of knowledge and abilities of its target public and use elements (such as expressions, concepts, images, figures and words) of its knowledge

and assistive technologies for people with visual or hearing impairments. This way, the service should overcome the effect of those impairments and also the limitations caused by illiteracy.

The interfaces are being designed in a way to break the resistance of the user in face of the ICTs and to make him interested in the service by offering an independent, efficient and pleasant use of the service.

The service will provide an application with interactive interface, which is automatically adapted to the user characteristics and limitations. For that to happen, at the initial moment of the interaction between the user and the application, the system will have to identify his profile, for example, type and degree of sensory disability, level of literacy, etc. This profile will be classified and associated to interfaces set that will be provided by the service.

The rural or urban worker, optionally, will be able to supply personal information, for example, rural or urban inhabitant, age and sex. The information and the profile will be stored with a biometric identity and used on his register for defining the more adequate interface for the user in his next login sessions in that application.

The access to the application will be carried out through a customized portal, constructed from the characteristics, limitations and preferences of the user. If the user is registered, that is, he has a profile associated with a biometric identity, the portal will contain its preferential applications, such as tools of communication, browsers, text editor and the service proposed; alternatively, the portal will contain applications of more general use.

For non-registered users, the system will have to identify their profiles and to configure automatically the most adequate interface each time they use the system. For the registered ones, the system will only have to recognize the user, through his biometric identity, and to recover his interface and gateway in the system.

If he wishes, the user will be able to configure his profile in accordance with his preferences and needs, being allowed to configure the interface and to add or to remove applications easily.

Sets of interfaces are being specified and developed, each one directed to a group of users in accordance with their characteristics, such as, low vision or blind people, full or partial hearing impaired people, plain or functional illiterates, and users without disability. The sets referring to partial impaired users and functional illiterates will be composed by more than one type of interface, depending on the degree of the sensory impairment or on the level of illiteracy.

Different medias will be used depending on the type of impairment, for example, in the case of blind people, the sound will be privileged for the communication, whereas for the illiterates, the images, sounds and figures will prevail.

The communication language will be of easy interpretation for people with low level of literacy in a way that the majority of population can understand the information provided by the Social Security System Internet site.

### CONCLUSION

In this article, an electronic assistant for the retirement applying process for rural and urban workers was presented. The importance of such service can be conferred in the projections of retirements to be granted in the future and in the social function of the Brazilian Social Security System, responsible for a significant amount of retirements and the social protection of elderly people. Another important aspect is the availability on Internet site of all the information and procedures required for the processes for applying the retirement benefits for the rural and urban workers.

The main contribution of our work is the development of a universal communication language and interfaces with a universal design for the attendance of all the types of workers, not only those without deficiencies.

All the functional and technical specifications have been already carried through and currently we are testing different assistive tools for the most appropriate choice, choosing the places for field trials and initiating the software codification. Also, the developments of the interfaces and studies to find the more appropriate communication languages for our target public have been initiated.

Initially conceived to the rural and urban retirements, this service could be extended in the future for the attainment of other social benefits as aid for illness and maternity-aid.

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