

E-Government and Approaches of e-Inclusion

STANISLAVA SIMONOVA
Institute of System Engineering and Informatics
University of Pardubice
Studentská 84, 532 10 Pardubice
CZECH REPUBLIC
<http://www.upce.cz>

Abstract: The development, take-up and patterns of use of information and communication technologies became in previous years a basic for systemic, process and structural changes on all levels of governance of the society. New technologies and network enable a completely different approach to and work with information resources, as regards quality and quantity. People are acquiring more and more skills necessary for working with new technologies and it is true for an increasing number of professions that a lack of such qualification is a reason for being disadvantaged or even excluded from the labour market.

Key-Words: e-Government, social inclusion, e-Inclusion, digital divide, user-friendly approaches

1 Introduction

Information and communication technologies present an opportunity to create modern an efficient public administration offering new or enhanced services resulting from reform of the previously applied procedures. Public administration is also a major market player, supporting both the development of and the demand for information a communication technologies products and services [1]. Public administration services must be user-friendly and available to all that is also to the handicapped or otherwise disadvantaged population groups.

2 Digital Divide

The target of social inclusion policies is to remove and stop creating barriers of any kind of the involvement of individuals or group of population in the active life of the society [2]. Analogously, the term of e-inclusion means a set of conditions for effective inclusion of all population groups in the information society. It is necessary to prevent further extension of the so-called digital divide, i.e. divide within population groups between the included and the excluded.

Information systems in public administration institutions and their regional data sources are supposed to serve for analysing and answering strategic regional enquiries, so that this informational environment would serve for an effective area administration and also as a information resource for other institutions and for citizens [3]. Information sources within public administration are used by users with various structures of their professions and with different knowledge in information technologies, or more precisely with unfamiliarity. Regional data sources of information

systems should enable the realization of not only an enquiry prepared within the software support, but also of a newly defined enquiry, whereas the level of definition is different (according to the varied composition of data environment users). When the specificity of enquiries about regional data sources is set, it is possible to trace the aspects of the method of enquiry input, enquiry creator, and enquiry quality [4] [5].

Enquiry creator:

- *an expert in both public administration problems and information technologies:* such an employee will not have any problems with the user enquiry input,
- *an expert in public administration:* public administration employee only with limited knowledge in information technologies (for the needs of his profession): the familiarity with terminology enables a good orientation in the user menu, but the creation of a new enquiry represents a problem,
- *a non-expert:* citizens or employees of other organization with minimal knowledge in the public administration professional terminology and with various levels of knowledge in information technologies,
- *a child:* children are also citizens and have right to information in the area of public administration; they have often high knowledge in information technologies, but minimal (or no) knowledge in the public administration,
- *a handicapped person:* citizens or employees of other organization with various knowledge in the public administration professional terminology, with various levels of knowledge in information

technologies and with limited possibilities to accept Internet information (according to their handicap).

Enquiry quality:

- *targeted enquiry*: correctly and effectively formulated by an expert in information technologies; enquiry is created in the enquiry language or by search in the system of links through key words (in Figure 1),

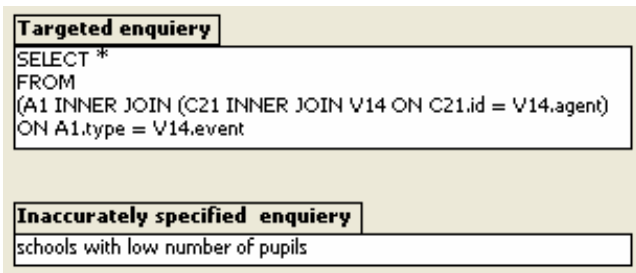


Figure 1: Targeted enquiry

- *inaccurately specified enquiry*: caused by technological or professional ignorance; these are either errors during the creation of a new enquiry or the inquirer, due to an inaccurate familiarity with professional terminology, does not orientate himself well in the user menu.

3 Approaches of e-Inclusion

As mentioned above, the term e-inclusion means a set of condition for effective inclusion of all population groups in the information society. The target of e-inclusion is to stop creating barriers of any kind of the involvement of individuals or groups of population in the active approach to information sources of public administration generally, to regional data sources in particular.

An important function of regional data sources is providing quality outputs on even more complicated or so-called inaccurately formulated enquiries.

Enquiry creators are represented by public administration personnel, staff of other organizations and especially citizens, i.e. enquiries are put with different accuracy, different knowledge in information technologies and different knowledge in public administration problems.

3.1 Fuzzy Approach

Public administration is, among others, obliged to preserve social cohesion, i.e. it cannot exclude generations or groups that cannot use the technologies from the right to information. The solution is a preparation of a suitable informational environment. Thus, to get a quality answer to an inaccurately entered

user enquiry, a certain pre-processing is necessary; when a fuzzy approach, which enables handling vague terms of natural language with the help of mathematical methods, seems to be suitable [7] [8]. There is possible to have (create) “general membership function for various regional coefficients (social, economic etc.). Then we can evaluate region according to its “public administration conditions”, it means we search crisp number from composed membership functions.

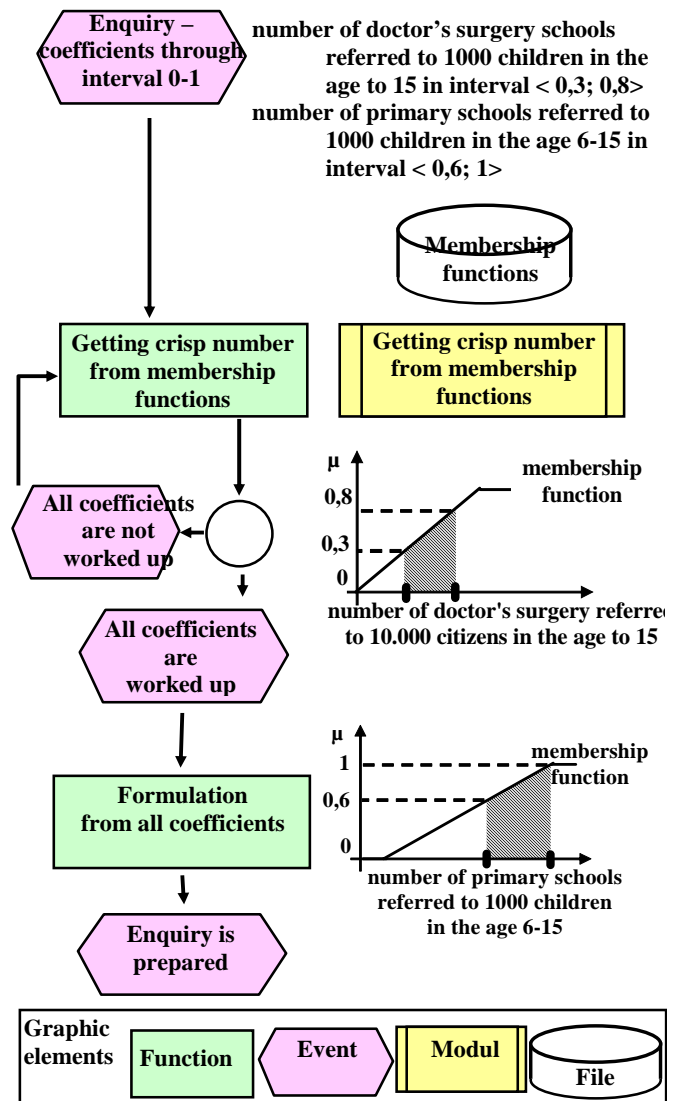


Figure 2: Example of the fuzzy enquiry

On the figure 2 is shown the chart flow of the user enquiry by means of using fuzzy approach.

General membership function can be made for various regional coefficients, i.e. number of primary schools referred to given number of citizen in the given age, number of doctor’s surgery schools referred to given number of citizen in the given age, number of theatres or public libraries referred to given number of citizen etc. On the figure 3 is shown specification of

membership functions for “medical care” and getting back to crisp number from composed membership functions. The described “convenient” medical care has characteristic:

- negative medical care (without any doctor’s surgery) means - $\mu=0$,
- positive medical care (from certain number of doctor’s surgery) - $\mu=1$,
- “convenient” medical care means i.e. $\mu=\langle 0,4; 0,7 \rangle$,
- corresponding doctor’s surgery numbers (referred to number of population).

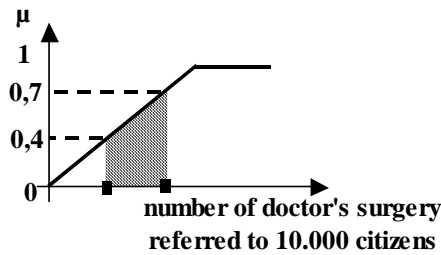


Figure 3: Specification of membership functions for “medical care” and getting back to crisp number from composed membership functions – “convenient” medical care

3.2 Blind/handicapped-friendly eGovernment

How to make web content accessible to people with specific needs has been an issue of growing importance for web designers [9]. The present guidelines contain a detailed description of rules for making web sites accessible to users with severe visual impairment – those who are completely blind or have only residual sight [10]. People with severe visual impairment are not only the blind, who are not able to receive visual information, but also visually impaired users – users with narrowed visual angle, severe short-sightedness, tunnel vision or colour-blindness. It is estimated that in the Czech Republic there live approximately 100,000 people with severe visual impairment. The web can become of great help for many of them being often the sole way of performing an activity independently - e.g. reading the news on the web, ordering goods in an e-shop or downloading a book from the Digital Document Library administered by Czech Blind United [11]. Users with visual impairment use special technologies for reading web content in order to make it accessible.

Blind users receive web site information via tactile or voice outputs thanks to which either a voice reads the text published on the web site or the text appears in Braille on a Braille terminal. Information about what will be read or displayed is transferred to voice synthesis or Braille terminal by a screen reader. The voice or tactile output is not a browser but it processes the website read by a common browser. Partially sighted users use software magnifiers in order to

magnify the web content. Sometimes the magnification is not sufficient and it is necessary to modify colour scheme or contrast. Partially sighted people use in addition to Microsoft Internet Explorer also other browsers, since these browsers have functions to make browsing the web site accessible to partially sighted. When designing or modifying web sites with regard to visually impaired users it is important to bear in mind the following:

- blind users are able to obtain only textual information,
- blind users learn the information on the web sites in a linear form, i.e. they do not have a global view of the information displayed,
- blind users work with the computer and all programmes via the keyboard by key orders,
- partially sighted users due to the use of software magnifier which provides for large magnification are able to see only a small part of the web at one moment.

3.3 eGovernment for Children

Children are also citizens and have right to information in the area of public administration. They have often high knowledge in information technologies, but minimal (or no) knowledge in the area of public administration, it means both in the whole issue and in the special public administration expressions.

It is necessary to create special web sites focused to children and teenagers. These web sites can involve basic rules and information for this user group. Example of that web site is “U.S. government interagency Kids' Portal” [12] (see Figure 4).



Figure 4: Example of web site of public administration focused to children

The topics of Kid's Portal are divided in more categories: Government, Organizations, Education, and Commercial. The user can find for example law for kids, information about social security, a guide to government for kids, federal rules established to protect children's privacy in the suitable way and other reliable information.

4 Conclusion

It is necessary to create equal conditions and opportunities to include all population groups in the information society. The regional data sources have to offer their information in the suitable way for all user groups. The methods of social Inclusion have to be realized by technology tools of e-Inclusion. The principle of equality must be maintained with regard to possibilities to use the opportunities offered by the information society.

References:

- [1] Ministry of Informatics of the Czech Republic: *State Information and Communications Policy*. Prague: Ministry of Informatics, 2004.
- [2] Ministry of Interior of the Czech Republic: *Public Administration in the Czech Republic*. Prague: Ministry of Interior, 2004.
- [3] Kopackova, H., Measuring e-Government – The Czech Republic in the View of International Evaluation Methods, *WSEAS TRANSACTIONS ON INFORMATION SCIENCE AND APPLICATIONS*, Vol.1, No.5, 2004, pp. 1277-1282.
- [5] Blazewicz, J., Kubiak, W., Morzy, T., Rusinkiewicz, M. *Handbook on Data Management in Information Systems*. Springer, Germany, 2003
- [5] Simonova, S. *Regional Data Warehouse*. Pardubice: University of Pardubice, 2003. ISBN 80-7194-580-3.
- [6] Stylianou, V., Savva, A., A Global Learning Environment, *8th WSEAS INTERNATIONAL CONFERENCE ON COMPUTERS*, Athens: 2004, ISBN 960-8052-99-8.
- [7] Terano T., Asai K., Sugeno M.: *Fuzzy Systems Theory and its Application*. Academic Press Limited London 1992.
- [8] Vysoký, P. *Fuzzy řízení*. Prague: ČVUT, 1996. ISBN 80-01-01429-8.
- [9] Abramowicz, W., Kalcynski, P., Wecel, K. *Filtering the Web to Feed Data Warehouses*. Springer, Poznan, 2002.
- [10] Pavlicek, R *Blind Friendly Web*. Brno: Czech Blind United, 2005.
- [11] Czech Blind United. < <http://www.brailnet.cz/>>
- [12] Federal Citizen Information Center: FirstGov for Kids [on-line]. <<http://www.kids.gov>>