Multi-Agent e-Government system for Samara region social services with using of integrated knowledge bases and smart cards of citizen

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Improvement of quality of the services provided by federal and regional government, and also local authorities is one of the most important objectives of Russian government’s policy. The key role in solution of mentioned problem, as it was underlined in the decision of Government of the Russian Federation from 2/9/2008, have information and communication technologies (ICT) allowing, on the one hand, creation of governmental services’ Internet portals, and, on the other hand, provide social services electronically.

The local, regional and federal legislation is the main base for the social services. As a rule, laws and other regulation documents are currently stored in the textual databases. But effective search in the hundreds of text pages for the relevant information corresponding to particular situation of the concrete citizen is a very complicated problem even for the advanced computer user. If it is necessary to spend a lot of time and significant efforts to complete such a search, citizen could even reject service, so the effectiveness of the ICT in e-government will be at zero level. In other words, traditional approach based on text databases, cannot provide required level of information’s accessibility, especially if it related to service not for just a small social group but for large groups of citizen.

Innovative ways for improving of the information’s accessibility have a computer technologies for knowledge representation and processing allowing to transform the text of law to the semantic network containing concepts (for example, social category, donation, etc), relationships between concepts, and rules which could be used for the ease and convenient hypertext navigation in the array of legislation data. It is possible to find laws or other regulations, applicable to the particular situation, automatically, and to formulate the answers to citizen’s questions. In such a way transformed legislation texts form the integrated legal knowledge bases uniting within a uniform semantic network federal, regional and local statutory acts related to the subject domain, in this case, to social support. So, there is an opportunity to relieve the user from necessity of performance of a complex sequence of the actions connected with a finding of relevant (=interesting for the concrete person) information.

For this reason such approach was put in a basis of creation of the regional SUPREMA system that electronically provides social services to the people in Samara region.

SUPREMA system developed in Samara region in 2003 – 2007 in accordance to the «Development of the first stage of regional e-government with usage of multi-agent technologies» project. This project became a winner of contest of the regional projects carried out by Ministry of economic development of Russia in 2002, and Samara region was named as a basic zone of Electronic Russia Federal Program.

Integrated legal knowledgebase in social sphere covers the most actual problems of social support, public health service, housing and communal services, education, culture, small businesses’ support and contains semantic network and logical rules formalizing 534 statutory acts including 278 federal, 164 regional laws, and 92 municipal documents. Knowledgebase of social service regulations include information about 455 privileges granted to 238 social categories and 72 regulations related to public health services.

Application of computer aided knowledge representation methods allows development of SUPREMA system as a multi-agent system. Each service could be associated with the special software agent which can interoperate both with other agents of services and with agent which is representing and acting on behalf of citizen with access to his personal information.

This approach not just allows to automate but to make more intelligent information search processes and interaction between government and citizens, because it provide to user only relevant information. That is why information retrieval procedures became more productive.
and effective. For example, changes in the legislation, reflected in a semantic network, can be used by the agent of corresponding service for sending address notices to citizens of Samara region whom these changes directly mention.

Fig. 1. The main page of SUPREMA Internet portal (healthcare services, social services, access to government, other social services, educational organizations, politicians, key events, etc)

Created network for public access to knowledge bases includes 260 Internet kiosks located in all 37 municipal sites of Samara region and provides all people of Samara region (3.2 millions of persons) access to information service (Fig. 2).

Personalized electronic services (payment for housing and communal services, appointment at social support office, discounts, etc.) could be provided by electronic social cards granted, on first stage, to 100 thousands of Samara citizens.

Introduction of regional e-government SUPREMA system has ensured following results:

- System supports providing of 534 federal, regional and municipal services in social sphere;
- The average time spent by the user to search of the relevant information about social services, was reduced in some tens times in comparison to existing legal databases;
- Time of the system answer to initial actions of the user does not exceed 5 seconds, so system provides effective dialogue interaction;
- Intensity of references of citizens to the Internet kiosks has made in 2006: 27 693 references, in 2007: 76 543 references, in I quarter 2008 more than 90 thousand references;
- Remote services (especially in countryside) allow relieving citizens of superfluous trips and idle standings in turns.
Samara Region: Results of First Phase

- 37 towns & villages
- 260 Internet kiosks
- Knowledge Base contains 534 laws and regulation acts
  - 278 Federal
  - 164 Regional
  - 92 Municipal
- Works for social care, healthcare, electricity and water supply, education and other social domains
- Social benefits for veterans, disabled people and many other categories of citizen
- 120000 social passport cards
- 50 Social Manager workstations
- 37 Knowledge Engineer workstations
- 6 Chief Executive Authority workstations

Fig. 2. Current state of the SUPREMA project
SUPREMA system won the Gold medal of 54-th World's saloon of innovations in Bruxelles Eureka! - 2005, was named in three best projects at 6th international conference on multi-agent systems AAMAS-2007, and was carrying out of administrative reform under Sergey Naryshkin's presidency (report №55 from 8/29/2006) has approved and recommended federal authorities and authorities of subjects of the Russian Federation to use experience of Samara region in creation of the integrated legal knowledge bases, development of computer representation of social services rules, creation of system of personalized interaction between government and citizens by means of introduction of the electronic social cards.

The Public Chamber of Russian Federation in decisions of public hearings ‘Information society - strategy of development’ on October, 29th, 2008 has noted socially significant results reached in Samara region by development of the integrated system of personalized social support and recommended to duplicate it in other regions of Russian Federation.

Opportunities of small-budget implementation was stipulated at designing phase of SUPREMA system development because computer knowledge bases is separated from a program code, so any reprogramming of the system is not required for new regions or when social laws are changing.

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