An Integrated e-Service to Support the Realization of Local Agenda 21 Plans

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Abstract: - Local Agenda 21 as a decision making methodology gives ordinary people, citizens, local people and communities, the right to have a say in how environment is managed and protected. The presented work demonstrates an e-service to support the implementation of Local Agenda 21 plans electronically, enabling the participation of all citizens to the social discussion, the exchange of experience and ideas, the adaptation of best practices and the dissemination of the results to the local authorities of each region it is applied. The e-service is a set of customized and integrated web 2.0 networking tools through which the potential impact of the political decisions are visualized and analyzed through discussion clusters, new ideas are born and mature, political views and opinions of politicians are evaluated. The actual users following this approach are ordinary people, citizens, communities, public authorities, enterprises, NGOs, associations and other stakeholders in each community.

Key-Words: - Local Agenda 21, e-Participation, Collaboration Platforms, e-Service, Social Discussion.

1 Introduction

In the beginning of 1990, the obvious global and local inequalities and injustice have driven the scientists and politicians to look for a new type of development, more user friendly for the people and the environment. In Rio, 1992, in the framework of the United Nations' conference, an agreement was signed between 178 countries for the implementation of this new type of development with local and sustainable scope that was named "Local Agenda 21" (LA21), where 21 indicates the 21st Century. LA21 is a comprehensive plan of action to be taken globally, nationally and locally by organizations of the United Nations System, Governments, and Major Groups in every area in which human impacts on the environment. [1]

Ten years later, in Johannesburg in 2002, the second summit promoted LA21 as the principal instrument for use in achieving the well-being of the world's population. Aimed at local administration, LA21 promotes, through public participation, a delicate balance between economic growth, social equity, and environmental protection. The concept of sustainable development calls for a constant re-evaluation of the relationship between man and nature, and solidarity between generations, as the only viable option for long-term development. [2]

Nowadays, Sustainable Development finds a significant impact to society and politicians. However, this term has been abused by different interests for communication and marketing purposes without actually proposing any measures in order to confront problems relevant to this type of development.

LA21, as a methodology for sustainable development, is implemented in several regions and actively influences the design and programming of actions with a long term scope, protecting today's life and acting methodically for tomorrow, with the active participation of the citizens through events and workshops that social and environmental discussions are taking place.

In Aalborg +10 conference held in Aalborg 2004 more than 550 local governments committed to meet the mandate given by LA 21 to work with all sectors of their communities - citizens, businesses, interest groups - when developing their LA21 plans.

2 Local Agenda 21 e-service

The presented work reinforces this intention of local governments, offering an integrated set of on line tools customized to control and simplify the implementation of LA21 methodology with main goal to increase the participation of the citizens to

social dialogue for sustainable development. The service also plays the role of the main dissemination channel to promote the results of these discussions to the decision makers and all concerned citizens.

The system is a web portal (Fig.1) with networking services integrated to the LA21 methodology steps (identification of problems, solutions, vision, results, proposed projects) that allows citizens to open discussion groups and share the problems facing in their day to day life proposing projects that should be undertaken towards specific visions. The services that are already integrated in the e-service are forums, blogs, newsletters, polls to support the implementation of LA21 action plans.

Fig. 1: Home page of e-agenda 21

The e-service reinforces the public discussion by enabling the participation of all citizens to LA21 discussion groups and by disseminating the conclusions of these social discussions to the local, regional and successively to governmental authorities.

Fig. 2: e-Agenda 21 in Municipality of Nea Smyrni

The portal is being already adopted by Municipality of Nea Smyrni, Greece (Fig.2) in the framework of the application of LA21 [3]. The portal is being piloted in the framework of Agenda 21 actions running in the municipality and it is evaluated positively by all relevant stakeholders.

2.1 Goals

The system e-service's goals are to:
- Offer the citizens the tools to decide, through direct and productive democratic dialogue, on measures needed in their areas that will positively affect their lives.
- Inform directly the citizens and the pubic representatives in a twofold information flow.
- Create a continuous communication channel between the local authorities, the government and the interested citizens.
- Reinforce the role of the local society to the political decisions around sustainable development.
- Support the communication and cooperation of municipalities/regions in subjects relevant to the protection of the environment, the cultural heritage, and the local development.
- Support the interregional exchange of best practices and the better implementation of sustainable practices.

2.2 Business Model

The e-service is based on state-of-the art tools for collaboration environments. The innovation of the e-service is the customization and the integration of the existing tools in an e-Agenda21 service that setups and coordinates LA21 plans electronically, improving accessibility for all citizens' groups.

The main innovation though, is that all these existing communication tools are integrated with ontology on sustainable development in a way that helps the user to personalize the system to his interests and find all relevant information easily and effectively.

The subscribed users are able to see a list of generic topics in that ontology. Browsing these topics they are able to find discussion groups depending on their preferences. If a topic is not found, the user is able to submit a request for a new one under a thematic category. Registrations to discussion groups are open for a certain period of time, but they reopen at regular bases. Each discussion group has a coordinator set by the administrator.

The methodology connected to the online tools is as follows:

1. The coordinator monitors the registrations and checks for their credibility.
2. When the critical mass is reached the coordinator closes the Group.
3. The participants though a blog dynamically created for the specific group add posts with the problems that have identified under the specific topic that the group deals with.
4. The coordinator gathers these goals and categorizes them to more abstract topics.
5. The participants are voting which of these topics are going to be addressed (maximum three).
6. Forums are dynamically created for each of the topics addressed as illustrated in fig 3. The participants can discuss in these topics possible solutions and their visions for the area.

Fig. 3: e-Agenda 21 forums

7. After a period of time where the topics have been discussed thoroughly the coordinator once again gathers the visions and solutions given creating proposed projects for the local authorities. For each project the participants create the following sections:
   • Problem addressed
   • Proposed solution
   • Duration
   • Cost
   • Expected results
8. The participants propose changes to the text of each project.
9. The coordinator asks the participants to sign each proposed project.
10. Another section is added to each project with the names of the participants.

11. The group closes its session.

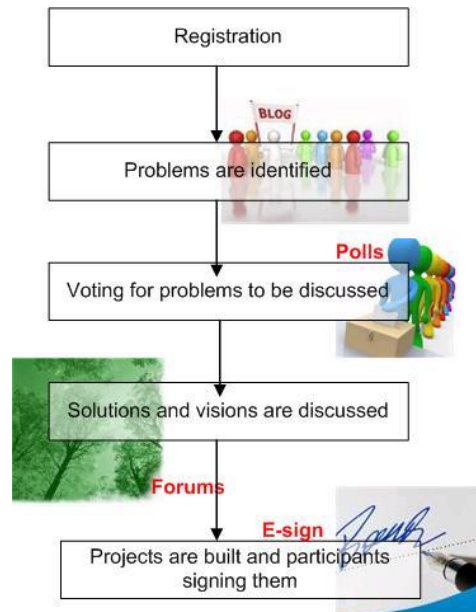The methodology which is followed to the online tools is showed in the following fig 4.

Fig. 4: e-Agenda21 methodology and tools.

A discussion group is possible to reopen according to the community needs or follow up discussions. Alerting services (e-mails, SMS) are available for all tools upon request of the user.

The added value, as mentioned before of the proposed work is that it uses common tools, in combination with a tailor made developed ontology that facilitates the categorization of all the information exchanged through the system and the exchange of best practices on common environmental issues between participants with the same concerns.

One of the crucial decisions when building the ontology was to decide on the formalism in which it will be represented and implemented [4]. Although many formalisms, such as Ontolingua [5] and LOOM [6,7] have been used in the last decades for this task, the growth of Internet has led to the creation of web-based ontology markup languages, such as RDF [8], RDFS, DAML +OIL and OWL, which seem to exploit better the particularities of the World Wide Web. As OWL [9] has become the standard ontology representation language of the WWW in general, and the Semantic Web in particular, the adoption of OWL for the needs of the LA21 systems was rather justified; not only due to the need of developing an ontology that will be WWW exploitable, but mainly due the semantic power of OWL's representation mechanism [10] which has been unanimously recognised among the

knowledge engineering community. There is a vastly growing community working on OWL and new OWL tools emerge on a day to day basis. The ontology is as generic as possible, multi-purpose in scope and application reusable.

For the development of the ontology the following methodology was used:

- Linguistic processing and analysis of electronic documents relevant to sustainable development.
- Identification of the one word and multiple word terms that came out from the above analysis.
- Construction of a catalog with terms that cover all the possible information concerning sustainable development issues.

All the terms of the ontology belong to one of the Global accepted terms of sustainable development and the web tools are accordingly customized around these (fig 5, fig 6). The first two levels of the ontology are:

- Sustainable Development and social issues
  - o Culture
  - o Recreational Sports
  - o School
  - o Youth
  - o Immigration
- Sustainable Development and Economy
  - o Work
  - o Commerce
  - o Professional Orientation
  - o Industry
- Sustainable Domestic Development
  - o Built-up Structure,
  - o Transportation,
  - o Pavements,
  - o Bicycle,
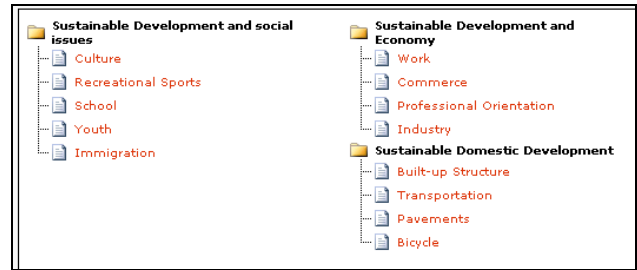 - o Etc.

Fig. 5: The ontology in a directory layout

Fig. 6: The ontology in a tree structure

3 Technology and Architecture

The e-service's architecture guarantees interoperability form and to third party applications. The web front-end has a user friendly GUI that enables users to access collaboration tools and effectively exchange ideas. The interfaces of the e-service are based on well recognized Human-Computer Interaction (HCI) principles with forms, like basic HTML elements (input, select, button, form, etc). These elements are rendered and behave almost identically on different (GUI-based) browsers consisting comprehensive and easy to use interfaces. In general the WAI guidelines (level 1) have been taken into consideration in the development of the e-service. Taking under consideration the recommendations of the European Interoperability Framework, the system is based on the utilisation of well-established standards in order to ensure technical viability of the envisaged service as well as easy integration of additional modules (for networking purposes) and possible exchange of information with third party systems. The e-service makes use of open standards like HTTP, TCP/IP, SMTP, Web Services [11], XML [12] and can be easily integrated with authentication systems [13]. The main set of technologies underneath is:

3.1 Presentation Layer

Developed in HTML and HTML forms. In order to improve the presentation's level efficiency and attractiveness and also allow off line work, HTML pages have been enhanced with programming units written in JavaScript and executed locally by the user's browser. More specifically, JavaScript has been used to get the effect of the collapsible navigation menus. The editors' views are divided into an HTML frameset, with navigation and mode controls in the top frame, and the contents of the selected object, or HTML forms in the main frame. Synchronization of the two frames is achieved through JavaScript code in the links.

3.2 Application Layer:

The application logic that is included in objects (components) written in Visual Basic or C++, running into the environment of the Windows 2003 Server. The intermediate between the user interface (web pages and forms) and the application logic (the components) are the Active Server Pages (ASPXs). Each ASPX is an individual programming unit written in a scripting language (VB .NET) and executed by the Microsoft Web server Internet Information Server (IIS). ASPXs can be referenced by the user interface (e.g. a browser) as any other normal HTML page. Upon request, the ASPX is executed by calling the proper components, assembling the output (in XML or directly to HTML) and sending this output to the client made the request. Components and ASPXs can be distributed across different application and Web servers respectively, improving the application scalability when new users are added.

3.3 Data Layer:

The data layer has been developed in the Microsoft SQL Server 2005. MS SQL Server 2005 is an integrated RDBMS providing management of many different types of data (structured information, binary large objects etc.). Changes to the data are made by stored procedures, which ensure that no unsafe changes are made. Microsoft IIS with web classes is used to manage the presentation of the data—selecting what to display, creating the HTML pages, and invoking stored procedures according to commands conveyed by the user.

4 Conclusion

The e-service promotes the participation of the people in social dialogue through an innovative platform including accessible web tools. In Aalborg +10 conference in Aalborg 2004 more than 550 local governments committed to meet the mandate given by Agenda 21 to work with all sectors of their communities - citizens, businesses, interest groups - when developing their Local Agenda 21 plans. Agenda 21 as a decision making methodology and other participating approaches give ordinary people, citizens, local people and communities, the right to have a say in decisions that affect their lives. They give meaning to the terms 'local democracy' and 'local government'. The e-service can be seeing as such an initiative for the improvement of the quality of life of the people that the policy makers will have to take under consideration. It is sure that most

people in the European Continent understand that current ways of doing things cannot be continued for ever and cause untold damage locally and globally. It is also obvious the peoples' need to change the way they live. Phrases like "eco-friendly", "climate change", "recycling" and "alternative energy" are now familiar to everyone. We believe that the electronic version of Local Agenda 21 methodology, will give a boost to the participation of the citizens concerning social dialogue, will produce more accurate results on the needs of people and the problems need to be faced and will also influence more the decision makers as more people will participate and be aware of what is required to improve their quality of life and what are the measures taken or not from the authorities in this direction.

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