Integrating Online and Traditional Involvement in Participatory Budgeting

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Abstract: Participatory Budgeting aims to increase democracy in city districts by permitting citizens to participate in the spending of public budgets and in the making of important decisions regarding public life. Until today, such participation was made available mostly through physical meetings organized by public administrations (off-line meetings). Only in recent years has software been developed in order to enable people to 'gather' using ICT methodologies (on-line meetings). The paper describes this research project aimed at building a framework able to increase citizen participation in public life by developing new approaches, including the integration of off-line and on-line meetings among citizens and public administrations. Project eDem1.0, coordinated by the municipality of Rome and financed by the Italian Ministry for Innovation during the period March 2007 to February 2009, has aimed to apply cutting edge Internet-based technologies (social networking, user-generated content, etc.) to enhance the processes of participation and consultation, both between citizens and government administration offices, as well as among such offices themselves. Sociological studies, expressly conducted by the Universities of Pisa and Rome, have provided the basis for the innovative means developed in the project (normative solutions and choices, new useful software instruments, project self-evaluation). The software platform, based on a social network structure, for implementation of such goals was developed for the most part at the ISTI Institute of the CNR in Pisa. Such development has been guided by the specific needs and wishes of the coordinating institution, to which a customized version has been provided. Initial testing of the software was begun within the framework of the Rome *Bilancio Partecipativo del Municipio XI* (Participatory Budgeting for District 11). The current version is a freely available, open-source solution. Other, customized versions have been provided to and used by the region of Lazio and the township of Pescara.

Keywords: participatory budgeting, eDemocracy, Symfony, Quimby, open-source, eDem 1.0, software reuse, electronic PB

1. Introduction

Participatory Budgeting (PB) is an innovative policy-making process, whereby citizens are directly involved in making decisions regarding the spending of public budgets.

During the decision-making process, the community can discuss spending priorities, make proposals, and vote on them. Moreover, the local population also takes an active part in scrutinizing and monitoring the process and outcomes. Thus, citizens have the opportunity to voice their opinions on resource allocation and social policies, and to monitor actual spending. The fact that the population is included in the policy-making process stimulates administrative reform and enables direct citizen participation in the distribution of public financial resources. Overall, the aim of PB is to increase transparency, accountability, understanding and social inclusion in local government affairs.

In democratic countries, governments have an obligation to promote citizens' participation in public life. The OCSE study entitled "*Citizens as Partners. Information, Consultation and Participation in Policy Making*" (OCSE 2001: 27-112), identifies three levels of citizen involvement in government: information, consultation and active participation. In consultation processes, government institutions take the initiative to open a dialogue with its citizenry. In "active participation", instead, citizens take the initiative to make their own proposals heard and therefore seek a dialogue with institutions (Malkia et al., 2004: 35-37)

To promote citizen participation, the public bodies nearest the citizenry must take the initiative in so-called "deliberate democracy" and go beyond the traditional structures of representative democracy. To this end, local governments can ensure the conditions for dialogue with the public. In this way, local governments can come to shared decisions, made in collaboration with their constituencies. Such cooperation represents a noteworthy response to the current crisis in the relationship between politics and society (Moon, 2002: 424-433).

In this scenario, new "Information and Communication Technologies" (ICT) can offer an important contribution. This contribution regards innovations to both administrative practices and performance (e-government), and the citizen's involvement in the processes of public life and politics (eDemocracy) (Carrizales, 2008). Judicious application of ICT can make an enormous contribution to removing or reducing the obstacles to and constraints on citizens' participation in a society's political process .

To promote such participation (Bimber, 2003: 197–239), the European Union has launched a number of initiatives, amongst which "Interactive Policy Making" (IPM). IPM calls for the development of forms of Internet-based consultation to involve citizens in European institutions, either with regard to specific issues or simply to gather their spontaneously offered opinions. A second EU initiative is the European Council's "Recommendations on citizen participation in public life at the local level". This initiative provides numerous guidelines to facilitate dialogue between citizens and national-level government institutions (Commission of the European Communities, 2003; European Council, 2006).

In Italy (Biasiotti and Nannucci, 2004: 274-276; Medaglia, 2007), although the use of ICT for such purposes is still limited, a number of initiatives are under way, particularly at the local-level, and range from innovative forms of consultation (regional agreements, strategic planning) to active participation in the political process (*Agenda 21, Bilancio partecipativo, Politiche dell'ascolto*).

One of the most well-established and widespread means to enhance citizen participation is participatory budgeting (PB). PB has by now been active for nearly 20 years in Porto Alegre, the capital city of the Brazilian state of Rio Grande do Sul. Since 1989, Porto Alegre's citizens have been able to actively participate in the formulation and planning of municipal policies through expressly called meetings with an average of 40,000 participants. Apart from implementing UN 'best practice' in city management, Porto Alegre was also the city chosen by the Worldwide Bank to host the 1999 Democratic Participation Summit. Today it has become a model for how to renew the relationship between citizens and institutions, thanks to its application of a system able to promote social inclusion, sustainable local community processes, transparency and the modernization of administrations.

The introduction of PB in a local administration can provide benefits and opportunities for all involved. The advantages for Local Governments is to support elected representatives' decisions, which through PB are based on the suggestions and approval of their constituencies. This moreover improves budget targeting, as the citizens participate in allocating public resources. PB can make a contribution to encouraging the redistribution of spending in favor of less well-off segments of the population, poorer neighborhoods, for example. It also helps local governments promote good governance, as authorities share public expenditure information and citizens thereby gain a greater understanding of how their local government works and how their taxes are spent. This, in turn, makes governing bodies more accountable. PB encourages community cohesion and brings people from different ethnic and religious backgrounds together to make decisions about their neighborhoods. It is lastly an opportunity for everyone to meet and discuss the needs and aspirations of the community as a whole.

The benefits for citizens occasioned by PB are greater access to information about local government, such as the amount of taxes collected, as well as budgetary forecasts and expenditures. PB enables citizens to participate in local decision-making and thereby fosters a greater sense of citizenship and democracy. Citizens can make suggestions on how to renew or develop their neighborhoods. Finally, PB furthers understanding between the various population segments present in a neighborhood and social cohesion among them.

The benefits to the community and volunteer sector are greater access to local public budgets and how they are spent. This increases the legitimacy of spending on local projects through community PB-funded projects. Once again, PB increases social cohesion within communities and gets people more involved in their communities and 'connected' to those already involved. Lastly, it creates a more open and responsible channel of communication between the public sector, the community, the volunteer sector and citizens.

The major benefit to the private sector is transparency. The business community often supports PB because it provides clear, thorough information on how business taxes are decided on, allocated and spent.

The use of ICT in the PB process is called electronic PB (ePB). ePB makes it possible for various stakeholders to participate in government through the use of Internet technologies, such as the Web. The ePB process enables overcoming some of the shortcomings of traditional PB. In general ePB provides broader access to information in a variety of formats (videos, blogs, etc). It involves groups of people that would not, or could not, normally engage in face-to-face PB, such as youths, busy professionals, rural communities, people with disabilities, and so forth. People can participate how and when they prefer, in an environment that many may find more comfortable. Online participation can be a valuable source of information for the public sector because it produces a record of what, when and how various actors have participated. People can choose to access as little or as much information as they like (printed formats often overwhelm people with too much information). Informal discussions in forums can lead to new, innovative ways of solving service issues. Budgets can be made more transparent by publishing information online.

Unfortunately, ePB presents some risks. ePB may provide preferential access to some groups of people at the expense of others. Whilst some may choose to participate online, others may choose not to, or may be unable to. There is, in fact, little objective evidence that ePB actually promotes PB processes as a whole. Such risks can be attenuated by offering integrated on- and off-line PB, in which ePB represents a support tool for traditional PB. Another risk comes from software companies, which typically work for profit and are not particularly committed to democracy or engagement. They may lock users into expensive software contracts, and copyrighted or bespoke software can limit flexibility of use. This risk can be limited through appropriate studies on PB and the development of open-source software. One further important hazard involved in any online activity is the risk of hacking, viruses and other malicious activities. Thus, any PB software must be implemented with suitable security measures. Another risk is that ePB may be manipulated and overrun by political elites, extremists or more technologically sophisticated users. In this regard, active oversight by moderators and users can ban inappropriate messages. One area in which investment by organizations is called for is to provide the necessary resources and training for staff to use the technology effectively. This involves organizations' setting up and supporting ad hoc infrastructures that can actively maintain and manage ePB processes.

The paper is structured as follows.

- Chapter 1 has provided an introduction to electronic participatory budgeting and analyzed some aspects related to the use of ICT.
- Chapter 2 then presents the Edem 1.0 research project, while
- Chapter 3 briefly discusses some related works.
- Chapter 4 details the functional characteristics of the Edem1.0 software package with its rules and regulatory framework.
- Chapter 5 presents the software solution used for electronic participatory budgeting, while
- Chapter 6 discusses the rules for platform reusability.
- Chapter 7 presents the results of the self-evaluation of the Edem1.0 project and
- Chapter 8 draws some final conclusions and discusses possible future developments.

2. Edem 1.0 project, research objectives

From 2008 to 2009, the local administrations of *Municipio XI* (City District 11) of Rome began regular trials of traditional citizen participatory budgeting. The online participation budgeting project exploited the experience acquired by those involved in the above-mentioned programs and sought to extend it by exploring as yet untested means: to supplement traditional participatory budgeting practices with ICT technologies in order to develop a new, combined participatory system.

To date, little use has been made of ICT technologies for citizen participation in the decision-making process regarding public budgets. At best, the use of ICT has been limited to publishing official documents and information on the Web, often sporadically at that (Buchstein, 2002: 250-251).

Within the framework of the project financed by the Italian Ministry for Innovation and coordinated by the Municipality of Rome, the Institute of Information Science and Technologies (ISTI) of the Italian National Research Council (CNR) has designed and developed almost all facets of the software platform *eDem1.0*.

Its aim within the area of participation budgeting is to develop the means to implement eDemocracy – intended as the exercise of the entire set of rights and practices underlying the relationships between citizens and public administrations, as well as among citizens themselves. Such goals have been pursued through the progressive adoption of ICT as an instrument for participation in politics, through information dissemination, discussion of issues and decision-making (Bouaziz, 2008).

The research objective is to supplement "real" processes (meetings, committees, councils) with "virtual" ones (through ICT). The sought for outcome is synergistic enhancement of participation due to the intrinsic characteristics of new information technologies, such as interactivity, hypertextuality, horizontal communication, many-to-many relations, and so forth. The literature on the subject has often highlighted that even the most advanced systems of participatory budgeting are often limited by the lack of universally available, efficient instruments for managing communication, information and documentation. In general, one difficult obstacle to overcome regards mediating between administrations and the citizenry – a function usually performed by various associations or organizations – with the consequent risk of an often inadequate level of transparency. Internet and other information technologies can play an important role in these spheres and can favor the expression of citizens' opinions, which either for practical reasons (lack of time, distance from meeting places) or psychological ones (reluctance to speak out in public) are often left unheard.
The main goals of the eDem1.0 project are to:

- Define the methods and tools necessary in order for the administrations involved to start up, maintain and manage online public participation processes. This activity also involves initiatives that are already in progress;

- Support and develop participatory communities within the administrative areas involved. The use of ICT and the Internet, in particular, can facilitate citizens' communication, interaction and decision-making. Each community is to involve all social actors in the area, such as public administrations, public and private enterprises and so on;

- Build and maintain a network community to provide access to participatory democracy and in particular, participatory budgeting. This community is to be made up of the administrations involved, as well as other stakeholders and all those administrations that wish to join the eDem1.0 project in testing its reapplication and best practice.

3. Related works

The relevant scientific literature offers many and varied solutions for e-participation.

The Webocracy Project (Dridi, 2001: 401-408) has met its stated objective of facilitating communication between citizens and elected representatives in local and regional governments. It provides user-friendly means for citizen to access information and knowledge bases through the use of ontology mechanisms. Citizens are given the opportunity to express their opinions on important public interest issues, formulate alternative solutions for such issues and eventually vote on them. Citizens can monitor the efficiency of public investments to increase of the quality of public services. Webocracy provides a security desk supporting several measures, such as user authentication, access control, etc. in order to fulfill the security requirements necessary to attain the stated objectives.

The purpose of the OntoGov project (Tambouris et al., 2004: 106-111) is to apply ICT in order to help increase productivity through greater efficiency, and thereby offer higher quality services and innovation. The stated goal has been attained by streamlining, re-organizing and supporting the back-office processes of public administrations providing citizens services. OntoGov aims to develop, test

and validate an e-government platform, which has been enhanced semantically through the use of ontologies to facilitate consistent composition, re-configuration and evolution of e-government services. A broker (such as a National Portal) can make all such services available via the Web, call centers, DTV etc., by exploiting the services-oriented architecture.

The E.D.E.N. project (Whyte and Macintosh, 2004) has developed a range of tools to support communication between citizens and public administrations and thereby enable more effective public participation in urban planning decision-making. The tools deploy Natural Language Processing technology to automatically process various kinds of text that are routinely used in such communication. One of these tools, for example, automatically routes citizens' messages to the appropriate public offices according to their content. Another tool supports public administration staff and citizens to automatically manage Frequently Asked Question (FAQ) lists and update the FAQs based on user feedback. It is furthermore possible to make documents easier to understand by identifying difficult expressions and technical terms. The software suggests alternatives from an organization-wide glossary and can execute word translations to better support ethnic minorities.

Like our solution, the Mobhile project (Komito, 2005:39-48) makes use of a local geographical interface usable both by government and directly by community members to provide access to information on the local territory. Thus, local residents can, for example, identify service faults by locating problems on a map. They can also leave comments, which are then automatically forwarded to local authorities to notify them of the problem. The project also implements useful functions for local community and voluntary groups, such as membership dues payment, discussion boards and mailing lists.

Also like our proposal, the Demos project (Luehrs, 2003) aims to develop and evaluate new ways to support large-scale on-line discussion and decision-making based on well-proven methods of social research. It offers a unified user interface to provide access to a variety of tools, such as survey organization, text mining and group formation. The basic process model includes three different stages, each with a specific goal: broadening, deepening and consolidating discussions. The first stages serves to initiate, facilitate and broaden the debate and also to identify the most important aspects of the topic. The second stage includes discussion of specific issues, which are then spun off into smaller discussion groups of interested participants. In the third stage such sub-forums are reintegrated into the broader forum, where summaries and related survey results are presented. The final result is a condensed document depicting the results of a dynamic and deliberative discussion respectful of the different points of view.

Unfortunately, none of these earlier important projects addresses the problem of integrating the “physical” or “real” meeting participation process with “virtual” online tools. We strongly believe that such an integrated approach represents the key to the success of many citizens participation processes.

4. Edem 1.0 project BP features

Participatory Budgeting can be considered a “work in progress” – a process in which rules and procedures are always up for revision in order to adapt them to any changes occurring in a specific context, such as for example socio-cultural and political-administrative settings.

4.1 Integrating online and offline tools

The heart of the participation process is the coming together of citizens, administrators, technicians and moderators. The physical dimension of such process is irreplaceable for its richness, complexity and comprehensiveness. Virtual participation constitutes an added dimension whose aim is to support, improve and innovate traditional methods. A unique system seeks to achieve integration of the two channels, the “conventional” one (off-line) and the virtual one (on-line).

To this aim, the project provides these normative features:

- Every instrument utilized in the traditional process will have a counterpart in the virtual one (meetings, working groups, questionnaires, surveys, focus groups, etc);
- The on-line tools have the same rules for access, use and participation as the corresponding off-line versions;

- Each local public administration that supports the on-line channel must specify the access rules for and the use of the services in conformity with the general guidelines for the entire process. Such definitions must be completed before beginning any on-line experimentation;
- On-line participation will presumably take on ever greater importance, considering the growing reliance of today's society on ICT. Nevertheless, physical meetings will always represent the fora where the plenum will have the last word;
- Updates and coordination of all participatory budgeting activities will be available through both channels;
- Coordination between the on-line and off-line processes is entrusted to the administration organizing and coordinating the traditional activities.

4.2 Process inclusion rules

Participation in the PB process is limited to stakeholders in the territory in question (in particular, residents, inhabitants, students or workers in the area), usually of at least 14 years of age.

Identity is to be established by either some official document or by self-declarations.
Three different access levels have been anticipated:

- Free, no restrictions level: anyone can read (but not post) all available information and documentation;
- Online registration level: registered users can access personalized services and can actively participate in discussions and publish information. In particular, the identity data input via online registration are verified through municipal birth registers;
- Physical registration level: physical registration at the administration offices enables members to be assigned a username and password for physical and online decision-making rights (polls and elections).

Secret voting is not required for the goals of participatory budgeting. A user identification procedure allows for avoiding multiple votes by the same person when a show-of-hands vote would be held at meetings.

4.3 Rules and regulatory framework of the participatory process in the Edem1.0 project

As mentioned, four important steps underlie the participatory process: information, discussion, deliberation, monitoring and evaluation.

4.3.1 Information

The main goal of this step is to reach the greatest number of citizens possible and to make enable them to actively participate to the process. In particular, this step aims to:

- Reach both the public administrations involved in the area and people who have difficulty accessing normal information channels;
- Ensure the correctness, completeness and timeliness of information;
- Ensure the permanence of horizontal (citizen-to-citizen) and vertical (administration-to-citizen and citizen to administration) flows of information up to the very end of the PB process;
- Ensure the effectiveness and integration of all the media employed;
- Permit coordination of all users able to provide information and documents;
- Provide information regarding participation rules, places and calendars, work progress , process monitoring and evaluation of public actions, using both traditional (newspapers, television, radio etc.) and telecommunications (institutional web site, mobile phone etc.) media.

All documentation on physical meetings (minutes etc.) is to be published on-line within 48 hours of the event and on-line discussion reports will be posted in dedicated showcases 48 hours before the scheduled dates for physical meetings in order to permit commenting and possible modifications.

4.3.2 Discussions

In this step, all citizens are called on to point out important and urgent priorities for each thematic area of the PB and to discuss them to find possible solutions.

Conventional communications are typically discontinuous and intermittent. The introduction of ICT instruments permits greater continuity of the PB life-cycle conversation processes because it imposes no time-limits; users can thus participate at any time. The "discussion" step aims to:

- Help overcome barriers that could exclude or limit participation (such as spatial and temporal constraints);
- Provide continuity to meetings, interchanges, comparisons and the planning shared events in both the horizontal and vertical dimensions within PB processes;
- Integrate traditional and ICT communication processes.

All meetings, thematic work groups and conventional focus groups are overseen by system supervisors, whose job is to facilitate communication and help participants achieve results. Supervisors may be elected citizens or paid outside consultants. In order to perform their tasks, they must learn to use both the on-line tools and communication techniques. There are two different supervisor roles:

- Forum administrators: control every forum technical feature, such as granting permissions, banning users, appointing and overseeing moderators;
- Moderators: stimulate debate and check that users' contributions respect forum policy.

The political and technical staff are an integral part of communication processes, so they participate in discussions according to the same rules applied to other citizens. They pose questions to citizens and encourage them to answer.

4.3.3 Deliberations

In this step citizens plan activities and propose problem solutions based on administrative competence and feasibility estimates. Citizens express their preferences for possible solutions to issues in different thematic areas and define an importance hierarchy for public action. The administration is then informed of the solution choices in order to propose them to the city council for approval and insertion into the following year's provisional budget.

Traditional voting procedures are used in off-line meetings by a show of hands and are supplemented by virtual ones using the following procedures:

- The casting of multiple votes by a single person (on-line and off-line) is avoided by assigning a unique username and password to each citizen;
- The votes expressed on-line are not published until the traditional voting has ended;
- On-line voting will remain open at least 15 days before the traditional one. The results are to be presented at the physical meeting.

The problem solution choice to be adopted is decided upon during physical meetings. Citizens vote to approve implementation of the proposed measures according to the results of the feasibility assessment carried out by the competent administrative offices.

4.3.4 Monitoring and evaluation

Citizens participate in monitoring the administrative processes (timeframes, costs, implementation) for carrying out the measures funded by the city budget as well as in evaluating the results attained.

A user training program provides the essential technical and theoretical knowledge to effectively promote transparency in public works and monitor and evaluate the activities of the public

administration. The results of these processes will be reported and discussed both on-line and at physical meetings.

5. The Edem1.0 software

Both the needs analysis and the feasibility study conducted for the project devoted special attention to evaluating the possibilities for the reuse and adaptation of existing software (Westholm, 2002).

While social networking and Content Management Systems (CMS) are in widespread use, platforms providing mechanisms for the collective formulation, selection and management of proposals and procedures for advancing such proposals are substantially lacking.

An approach to customizing existing CMSs may have been quicker and, in some respects, easier, because it would have enabled starting with a working base. However, for the goals of the project, such a solution would have unfortunately involved considerably complex modifications.

Among the CMS applications considered for potential adoption, *Typo3 (http://typo3.org),* implemented with the *php4* programming language, and *Plone (http://plone.org),* implemented in the *python* programming language, both provide valid mechanisms for content management, but both would have called for great effort in terms of customization to meet the requirements of *eDem1.0*, with the consequent risk of unsatisfactory results.

Therefore, in the end an ambitious choice was made: to develop new, reusable software expressly designed to address the specific issues posed by *eDem1.0* based on the findings of the sociological and anthropological studies conducted by the universities of Pisa and Rome within the framework of the project itself. The result is *QUIMBY*, a completely open-source, GPL-license application, created with the purpose of providing a new approach and innovative contribution to furthering the manifold aims of eDemocracy.

5.1 Symfony

For any web application, the choice of an appropriate software development environment, i.e. Web framework, is crucial.

A number of innovative working environments with different programming languages were considered, analyzed and tested. Of these frameworks, Model–View-Controller (MVC) based systems were preferred, as they enable developing applications with clear intrinsic conceptual and operative distinctions between the application (i.e. business) logic and the graphical presentation of the application. The final choice was *Symfony* (http://www.symfony.org), an open-source environment offering efficiency and reliability. It is based on *php5* (http://www.php.net), one of the best-known and widely adopted programming languages for dynamic Web applications. Apart from the above-mentioned benefit of clearly separating business logic from content display, the most important advantages of the *Symfony* environment are the ease with which the user interface can be defined and server-side operations optimized. It moreover offers support for Ajax (*A*synchronous *J*avaScript *a*nd *X*ML, see http://en.wikipedia.org/wiki/AJAX), an advanced technology for the creation of interactive Web applications.

5.2 Application components

The application components implement the social networking functions necessary to support the emerging decision-making process. In fact, all platform functionalities focus on citizens' interactions (among themselves as well as with public administrators). The most important of these are the following:

Discussions: registered citizens use this feature to debate proposed solutions to any problem raised according to the followings scheme:

- Problem posting: citizens can raise an issue concerning a specific territory and associate it to a thematic area. The problem description may include attachments, links to external resources, and so forth. The problem is automatically displayed in a visual representation through Google maps. Other citizens can declare their interest in the problem and post comments;

- Solution proposal: problem solutions may be proposed either by the citizen who becomes the 'owner' of the issue, or by a moderator, who can add to the on-line system any proposals emerging during off-line meetings. Fig. 1 shows a graphical representation of the bureaucratic path of a proposal up to its definitive approval and execution. The steps are: the problem solution is proposed in a workgroup or via the Internet; municipal offices assess technical and economical feasibility; the physical assembly votes on the proposal; if approved, the solution returns to municipal offices for budgeting and in the end the solution is implemented.

Figure 1: Path of problem solution proposals

- Support for proposals: citizens may express or revoke their support for a proposal. This is performed by attributing a score to each proposal. Then, the proposals with the highest scores are presented to the municipal technical offices for feasibility evaluation.

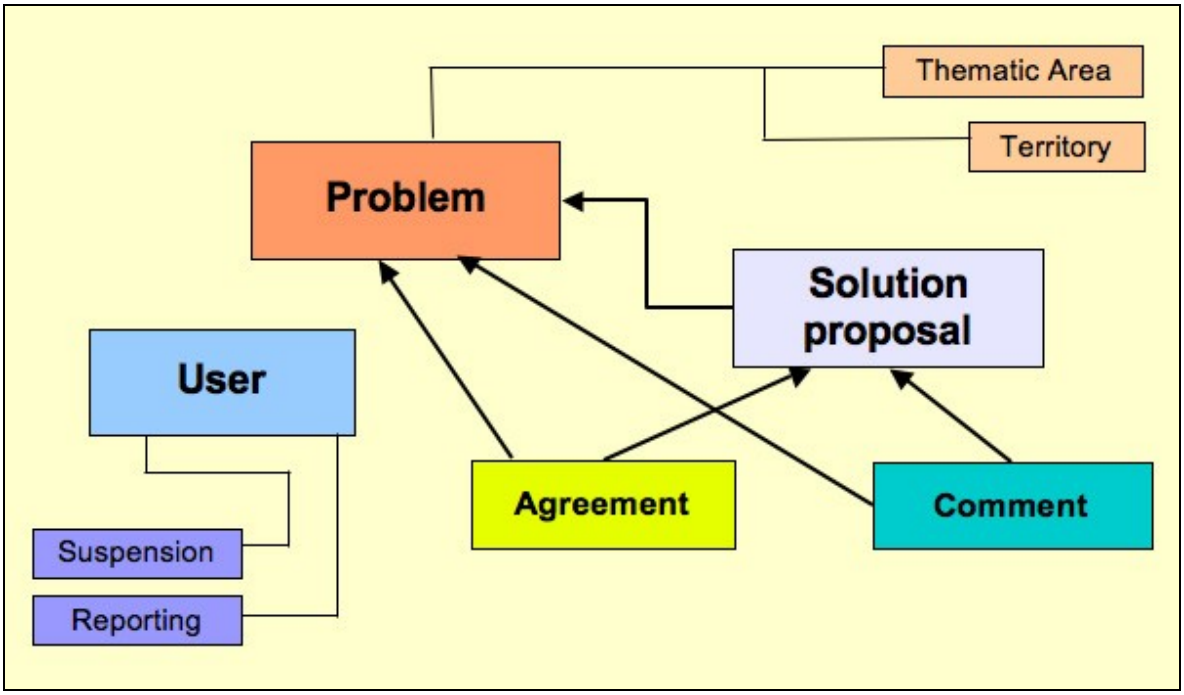

Figure 2: The problem-proposal component structure

- Messaging: this software component permits the exchange of messages among citizens and provides system notifications of new messages. By default, messages are not sent using standard email protocols, but an express internal e-mail system. The goal is to enhance normal e-mail features with predefined exchange messaging functions (spammer flag, warnings, friend list), which depend on event verification, so the system can automatically take appropriate action. In any event, users can configure the system so that all messages are also forwarded to their personal email addresses.

6. Platform reusability

Software reuse is the process of creating software systems from existing software rather than building new systems from scratch. The primary motivation to reuse software is to reduce the time and effort required to create software applications. The quality of software systems is enhanced by reusing quality software artifacts, which also reduces the time and effort required to maintain the systems.

Abstraction plays a central role in software reuse. Indeed, it reduces the effort required to go from the initial concept of a software system to its representations. Without abstractions, software developers

would be forced to sift through a collection of reusable artifacts trying to figure out what each artifact did, when it could be reused, and how to reuse it.

One important feature of the *QUIMBY* software is that it has been designed and developed following these concepts for subsequent easy reuse in other contexts of use (Cowan, 1995). To this aim, its development has also adhered to the following criteria:

- It uses open-source components;
- The adopted language is widespread and unlimited by commercial licenses;
- The underlying database technology is well documented and easy to use;
- It follows standard development models;

The code is structured so as to separate the operative portion, responsible for data processing, the graphical presentation of content and results, and the logical descriptions and structure of the data. Such an approach avoids the need for extensive changes to the entire platform in the event that modifications need to be made to a single component .

Beyond the obvious economic advantages of such an approach, a second aspect is well worth underlining: establishing a working standard. In this regard, platform reusability, in fact, takes on considerable importance, given the project goal of creating a model for adoption in other contexts of use. It is hoped that such a model will be viewed as a reference point for the implementation of participatory budgeting in other eDemocracy initiatives.

6.1 Motivations for QUIMBY reuse

The technological choices made in carrying out the project are such that most administrations interested in using *QUIMBY* are likely to already have the necessary prerequisites for implementing the platform. That is to say, if an administration wishes to install and manage the platform on its computer system, it is unlikely that extensive modifications will be needed (provided that their systems are already able to provide simple traditional interactive Web services).

Moreover, *QUIMBY* may likely be used advantageously even “as is” (except for some minor reconfiguration). Or, depending on specific needs, it can be modified radically in terms of its functionalities (within the limits of the economic advantages to be gained from its reuse). In this regard, it is expected that particular customizations will be called for to satisfy the requirements of processes involving different models or levels of participation (information, communication, consultation, shared planning, decision-making). The software modifications needed may involve substitutions and/or simple additions.

6.2 Technical notes on application reuse

The platform has been designed with particular attention to obtaining a clear separation between its constituent components.

From a technical perspective, such goal has been attained by adopting the MVC architectural approach.

As represented in figure 3, the Controller represents the application engine. It exploits the data in the database, which is described in the Model, and feeds it to the View as necessary to display a graphical representation of the current state or results.

Therefore, in principle, if a different data model is needed, the necessary modifications will be limited for the most part to the Model component.

The most likely case is that modifications to the View component alone will be called for. The application will thus remain unaltered in terms of both functionalities and data types, and only the graphical presentation component will have to undergo any change.

Instead, if the application's functions are to remain the same, but different data types from different sources need to be used, the Model component alone will require modification.

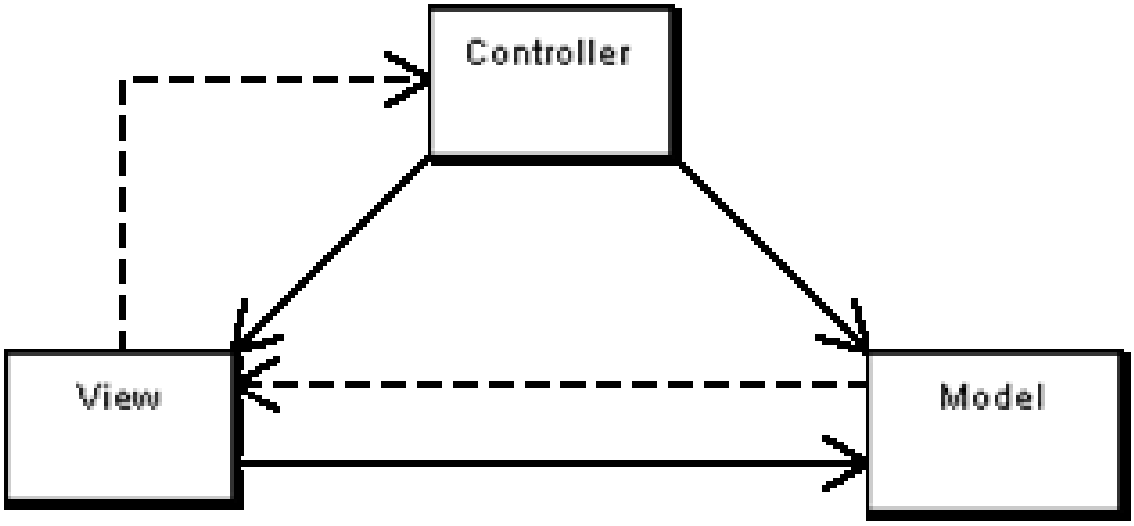

Figure 3: Model-view-controller architecture

A more complex adaptation can be envisioned when the platform is to be applied in a context analogous to, but different from, the initial one. Such adaptation would require more than simply customizing the graphical or data component. In this case, the application behavior, and therefore business logic, must be modified by acting on the Controller component.

Finally, for certain applications none of the platform components may need to be modified at all. In fact, some parameters, such as the organization name and logo, the geographic features of an area, and so on, can be changed dynamically through simple application configuration settings.

With reference to figure 4, the *yml* configuration and *microcontent* involve no modifications at all to the application code. The *yml* configuration regards modification of basic parameters, as described above. The *microcontent* level instead involves basic message management functions provided by the Web platform (e.g., e-mail confirmation of subscription or a brief description of the administration and its area).

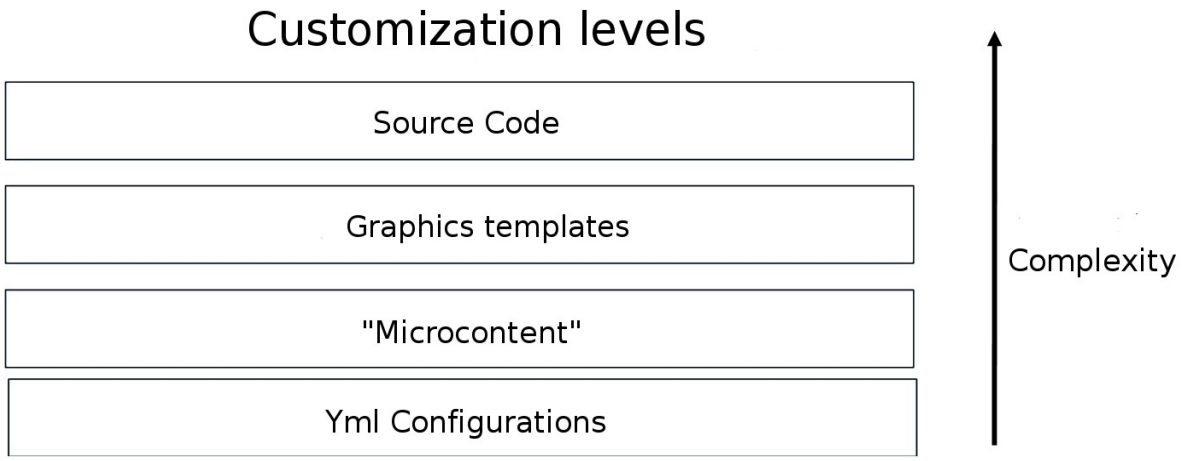

Figure 4: Customization levels

Then, the *graphical template* level involves modification of the View component alone, while the highest level, the *source code,* contains two distinct cases: modification to the Model and/or Controller (in essence, generating a new application). Obviously, in the latter case, the complexity of reusing the

application is greatly increased, but this however enables complete customization of the platform to new contexts of use.

7. The self-evaluation

Self-evaluation of the project was carried out according to the guidelines of the CNIPA (the Italian national center for computer science in public administrations) and included the following three steps.

1. Participation levels: analysis of the quality and quantity of citizen participation achieved during the Edem 1.0 project. The goals were to:

Verify the level of citizen sensitivity to ICT: an initial questionnaire was administered to citizens to estimate the degree of trust in new information and communication technologies and to build the first PB-interested citizen archive.

Typical questionnaire questions were:

- Where do you connect to the Internet?
- What kind of connection do you use?
- How many times a day do you check your email?
- How often do you browse Websites?
- What are your reasons for Website browsing?
- Have you subscribed to any mailing lists?
- Do you use discussion forums?
- Would you like to be contacted to participate in the PB process?

Define user types: static analysis of citizens' personal data, such as address, date of birth, education level and current job;

Verify on-line platform use: number of registered users, number of posted problems and solutions, etc.

2. Satisfaction with the on-line platform: users rated the software on a scale of 1 to 5 regarding a number of aspects such as: ease of use; effectiveness in improving PB information and the relationship between citizens and public administrators; quality of on-line and off-line process integration, etc.

3. Effectiveness, quality and impact of the project self-evaluation: a self-evaluation committee made up of 16 people validated the proposed self-evaluation tools and coordinated the evaluation itself.

7.1 The self-evaluation results

This self-evaluation involved, amongst other things, checking the level of citizen participation during the test. The results have made possible an analysis of citizens' satisfaction level as well (Norris, 2001: 195-232; Wangpipatwong et al., 2008: 56-58). The data reported here have been drawn from the Master's thesis "Statistics for system information management" (Cristina Riacà, BILANCIO PARTECIPATIVO: L'AUTOVALUTAZIONE DEL PROGETTO E-DEM 1.0, Università degli Studi di Roma "La Sapienza" - Facoltà di Scienze Statistiche), carried out within the framework of the project. The resulting data have been obtained via an assessment questionnaire filled out by the citizens of District 11 who took part in "on-line" and "off-line" participatory budgeting. Further data have been obtained by analyzing the platform log files to generate user interaction statistics.

The first question posed to citizens regarded the level of participation during participatory budgeting initiatives. The data obtained (Table 1) show that most of those surveyed occasionally took part in the announced meetings. Although this represents only 15.6% of all participants, it is 71.8% of those expressing an opinion (21.7% of the total).

Regarding the profiles of those surveyed, 60% of citizens declared they participated in at least one of the participatory budgeting activities. With regard to those who used the Internet site, 56.7% were male, 50% had a university degree and 37.5% had secondary school diplomas. Meeting participants were 50% male, 50% university graduates and 30% secondary school graduates.

Table 1: Participation level in participatory budgeting

Participation level	% of total	% of those expressing an opinion
Assiduous	2.5	11.6
Quite assiduous	3.6	16.6
Occasional	15.6	71,8
Total	21.7	100
Unanswered	78.3	
Total	100	100

It is quite interesting to analyze the actual accesses to the platform to reveal any trends. The site included a monitoring function that has enabled analyzing the citizens' involvement in local politics through ICT.

During the first three months, the system logged 5,000 accesses, with an average of 55 visits per day. Regarding access distribution over time, throughout the test, Saturdays and Sundays were the days of the week with the lowest number of logged accesses. A slight decrease in visits was also recorded in July, which showed an average of 45 visits per day, as compared to an average of 61 per day during the month of May (Figure 5). This decrease was correlated with a halt in the participatory budgeting process, which ended in late June. The greatest number of visits (140) occurred on July 27th, when the results of the previous days' citizens' vote were published. Visits generally occurred throughout the daytime hours, though they were especially frequent during the middle part of the day.

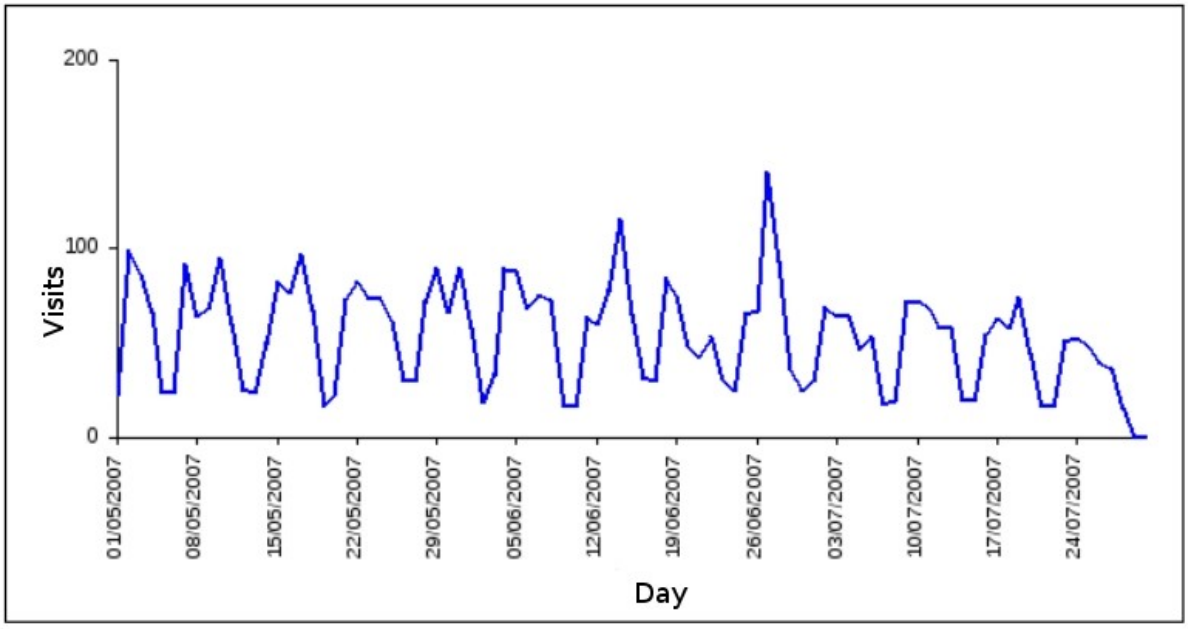

Figure 5: Number of visits per day

As mentioned, one of the surveys conducted not only checked the use to which the Web site was put, but also asked the users to rate various aspects of the online participation system (on a scale of 1 to 5, see figure 6). The site received a high number of positive ratings (scores of 4 and 5) for its usability: it was thus judged easy to use by 54.5% of all those providing a rating. To this we may add the 18.3% who rated usability at an intermediate level (score of 3) and therefore did not express a negative judgment. The site received its highest scores for the awareness gained by users of the proposals

advanced in various city districts. Lastly, 60% of those surveyed said that the Website made local political activities more visible (i.e. improve communication and collaboration)

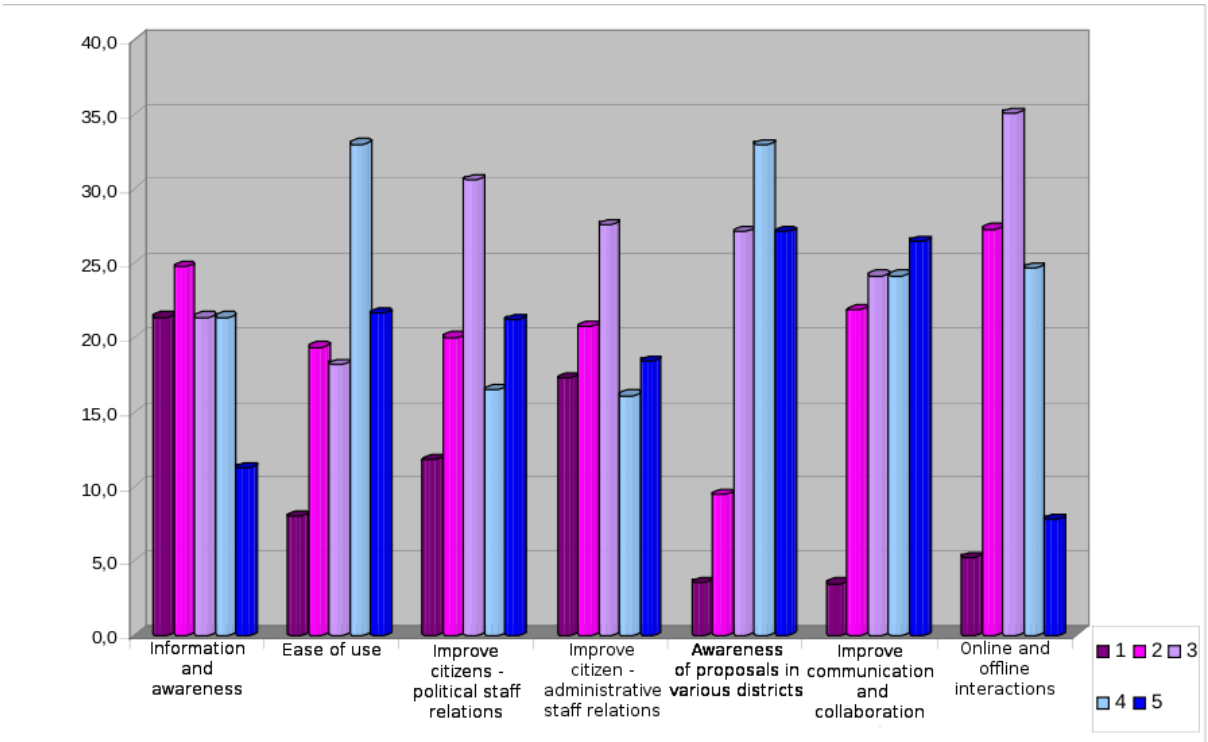

Figure 6: User ratings of the online participation

From the responses given to the questions on the reasons for accessing the site (figure 7), it emerges that most of those surveyed browsed the site to obtain some general information on participatory budgeting and become more aware of current problems and proposals.

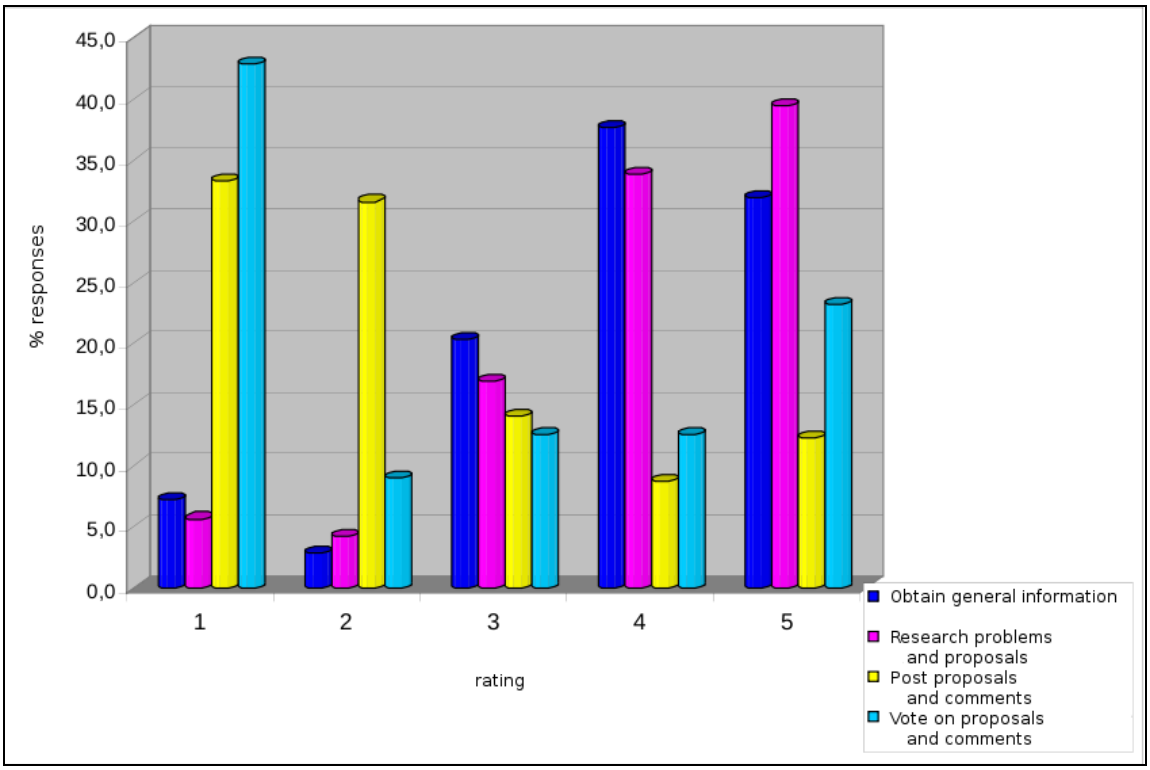

Figure 7: Reasons for using the Website

Less frequently, the site was used to vote on proposals or posted comments, and even less to actually make proposals or post comments. Therefore, as seen in other surveys on citizens' attitudes toward ICT, passive use of the site prevails. Thus, people seem to use the Internet mostly as a means to obtain information; unfortunately, its use for active communication and participation is still regarded with a certain degree of misgiving.

As revealed by the report Eurobarometer (2007: 4-5), citizens' clear interest in politics is unfortunately marred by increasing dissatisfaction about how democracy works in Italy. Indeed, 58% of citizens express a negative judgment in this regard.

Citizen discontent regarding Italian democracy is mirrored by a substantial lack of trust in national institutions, including those not necessarily linked to politics, such as religious and security organizations. Only 23% of Italians trust the national government, 25% the Parliament and only 16% political parties. Nor was the European Union spared from such criticism, only 43% of Italians express faith in the EU.

Citizen's mistrust of politics is often based on their feeling of being excluded from the political decisions of their country. What emerged from the survey was that the participating citizens gained a sense of satisfaction from feeling that they had an active role to play in government choices at the local level. In fact, most of those interviewed admitted that with eDemocracy initiatives, citizens are regaining the confidence to at least establish a dialogue with local administrations.

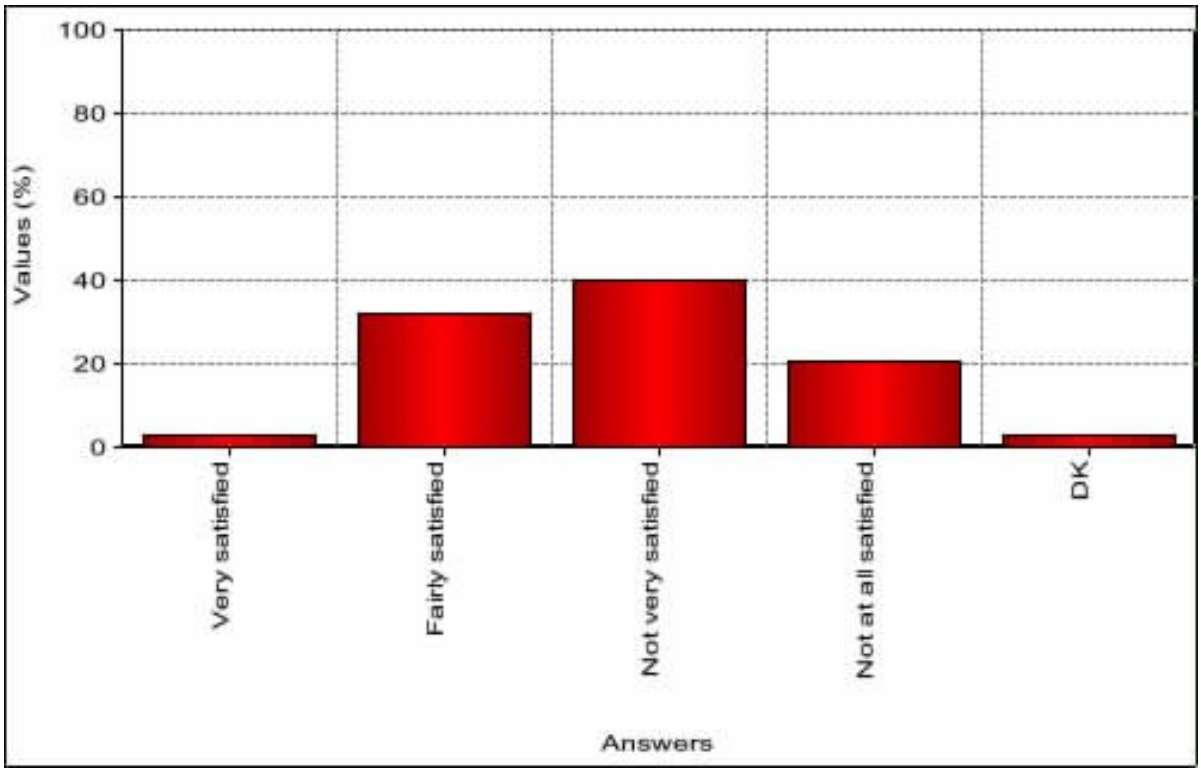

Figure 8: Results for the question "How about the way democracy works in Italy?"

8. Conclusions

The paper addresses the challenge of achieving participatory budgeting and describes a field test conducted in the city of Rome. The Edem 1.0 research project proposes a new approach to eDemocracy, using new methods and tools that adopt some features typical of social networks, that is, by combining traditional physical processes with the most innovative ICT instruments.

The analysis conduced by the self evaluation program has enabled us to outline the potential for the spread of participation democracy in local politics, with special regard to ICT-based techniques.

As revealed by their overall positive evaluations, citizens found the participatory budgeting portal to be generally satisfactory. The main reasons for such success seem to be the site's ease of use, and more importantly, its role in heightening public awareness of the proposals advanced by various city districts, and improving not only communication and collaboration amongst citizens, but also the relationship between citizens and politicians.

The prototype system presented seems to satisfy all the requirements – in terms of best practice for citizen involvement and interaction – that emerged from the social and psychological studies of the Social Science department of Pisa University. The project has also met the stated administrative requirements of the Rome Municipality, as well as the need to integrate on- and off-line participatory budgeting. The result is an innovative, highly reusable, open-source platform, well-suited to electronic participatory budgeting applications. The software is moreover highly adaptable for use in many other contexts as well. For example, it can be easily adapted to different programs calling for other models or levels of involvement (information, communications, consultation, collaborative planning, decision-making and so forth).

One negative aspect that has emerged from this first experience was a progressive decline in the active participation of public officials over time. One possible reason for this is that the public administration's participation in the program was only part-time, and participants therefore seemed to lack commitment. One conclusion to be drawn is that the success of participatory budgeting depends heavily on involving staff who are not only trained in its use, but who are above all dedicated to its objectives. It thus seems advisable to employ expert Website moderators to act as the interface between the citizenry and public administrators, and especially to stimulate these latter to take on a more active role in e-government.

References

Biasiotti, MA. and Nannucci, R. (2004) *Learning to Become an E-citizen: The European and Italian Policies*, Springer Berlin / Heidelberg, pp 269 - 280

Bimber, B. (2003) *Information and American Democracy: Technology in the Evolution of Political Power*, Cambridge University Press, Cambridge

Bouaziz, F. (2008) *Public Administration Presence on the Web: a Cultural Explanation*, EJEG, Volume 6, Issue 1, pp 11 - 22

Buchstein, H. (2002) *Bytes that Bite: The Internet and Deliberative Democracy*, Constellations Volume 4, Issue 2, pp 248 - 263

Carrizales, T. (2008), *Critical Factors in an Electronic Democracy: a Study of Municipal Managers*, EJEG, Volume 6, Issue 1, pp 23 - 30

Commission of the European Communities (2003) *eEurope 2005: an information society for all*, Bruxelles

Cowan, L. (1995) *Abstract Data Views: An Interface Specification Concept to Enhance Design for Reuse*, IEEE Transactions on Software Engineering, vol 21 n. 3, pp. 229-243

Eurobarometer (2007) *Eurobarometer 68. Public opinion in the European Union*, European Commission, autumn 2007, National Report, Executive Summary, ITALY, pp. 4-5

European Council (2006) *Current Sustainable Development Strategy*, DOC 10917/06

Dridi, F., Pernul, G. and Sabol, T. (2001) *The Webocracy Project: Overview and Security Aspects*, Professionelles Wissensmanagement: Erfahrungen und Visionen, S. et al., Ed. Shaker Verlag, Aachen, pp. 401-408.

Komito, L. (2005) *e-Participation and Governance: Wedding the net*, Electronic Journal of e-Government, vol, 3 issue 1, pp 39-48

Luehrs, R., Pavón, L. and Schneider, M. (2003) *DEMOS Tools for Online Discussion and Decision Making*, Springer Berlin / Heidelberg, vol 2722/2003, pp 243-246

Malkia, M., Anttiroiko, A. and Savolainen, R. (2004) *eTransformation in Government: new directions in government and politics*, London: Idea Group Publishing, pp 22-49

Medaglia, R. (2007) *Measuring the diffusion of eParticipation: A survey on Italian local government*, IOS Press, Volume 12, Number 4, pp 265-280

Moon, MJ. (2002) *The Evolution of E-Government among Municipalities: Rhetoric or Reality?*, American Society for Public Administration, Volume 62, Issue 4

Norris, P. (2001) *Digital Divide: Civic Engagement, Information Poverty, and the Internet Worldwide*, Cambridge University Press

OCSE (2001), *Citizens As Partners. Information, Consultation and Public Participation in Policy Making*, [online], http://books.google.com/

Tambouris, E. et al. (2004) *Ontology-enabled e-gov service configuration: an overview of the OntoGov project*, Knowledge Management in Electronic Government 2004 Proceedings, Berlin: Springer

Wangpipatwong, S., Chutimaskul, W. and Papasratorn, B. (2008) *Understanding Citizen's Continuance Intention to Use e-Government Website: a Composite View of Technology Acceptance Model and Computer Self-Efficacy*, EJEG, Volume 6, Issue 1, pp 55-64

Westholm, H. (2002) *eDemocracy Goes Ahead. The Internet As a Tool for Improving Deliberative Policies*, Springer Berlin/Heidelberg, Volume 2456, pp 237-244

Whyte, A. and Macintosh, A. (2004) *Electronic Democracy European Network (EDEN). Summary of D6.2 Final Tool Validation and EDemocracy Evaluation Report*, Edinburgh: