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Proceedings

The Voting Processes in Digital Participative Budget:
A Case Study

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Abstract: The Participative Budget consists of a process in which citizens can directly participate in decision-making and regulation of public budget spending. The experience of the City of Belo Horizonte (Brazil) with the Participative Budget is a consolidated e-democratic process in the government and, most importantly, for the population. By exploring techniques provided by Information and Communication Technology, the Digital Participative Budget was introduced. Hence, a new question is posed: which methodology should be used for the computerization of this process and what would be the best suited interaction and communication resources for the e-democratic process? Such decisions will be discussed in this paper. This paper presents the experience of Belo Horizonte with the implementation of the Digital Participative Budget, from the very conception and implementation of the project up to the voting period as well as its current phase. Accordingly, this paper broaches the discussion of the conditions that led to the development of this project, the model adopted for the computerization of the process, the functionalities of the web system, and the data from the case studies developed in Belo Horizonte.

1 Introduction

The Participative Budget, or PB, consists of a process in which citizens can directly participate in decision-making and regulation of public budget spending. Participation becomes effective by means of public Participative Budget assemblies, generally implying presence, which assures all citizens an equal weight in the decision-making process, regardless of their affiliation to any type of organization and lacking any privileges.

This public policy of political participation is one of the dialogical instruments created to bring together citizen and public administration in the generation of public interest, creating new pathways for Representative Democracy. Voting does not suffice; one must also participate. It is also not enough to base general (public) decisions in technical theses. These are certainly important, but consensus reached by those directly concerned (whether individual citizens or the community) must always be a desideration of this new Public Administration tendency.

The experience of the City of Belo Horizonte (Minas Gerais, Brazil) with the Participative Budget began in 1993 and was a result of an institutional change seeking the creation of government spheres that would be closer to the citizens and better able to perceive/address the demands of the populace. Today, the Participative Budget is already a consolidated process in the government and, most importantly, for the population of Belo Horizonte. Since it was first established, almost one thousand public constructions have been initiated and delivered to the population, a fruit of the population's choice via Participative Budget.

In the year 2006, the municipal government reached a milestone regarding this policy, guided by the pursuit of increased political participation. By exploring techniques provided by Information and Communication Technology, the Digital Participative Budget was introduced. Hence a new question is posed: which methodology should be used for the computerization of this process and what would be the best suited interaction and communication resources for the e-democratic process? Such decisions will be discussed in this paper.

Consequently, this paper presents the experience of Belo Horizonte with the implementation of the Digital Participative Budget, from the very conception and implementation of the project up to the voting period as well as its current phase. Accordingly, this paper broaches the discussion of the conditions that led to the development of this project, the model adopted for the computerization of the process, the functionalities of the web system, and the data from the case studies developed in Belo Horizonte.

2 Democracy and the Internet

In democracy power can be exercised by many, it is the people's expectations that prevail in all political decisions. According to [Ca64], democratic political forms are grounded on the assumption that no man or limited group of men is wise enough or good enough to govern others without their consent. Inquiring into their preferences is an essential part of the democratic process. However, freedom of expression in democracy does not merely involve being able to express an opinion about predefined options. In order for it to be effective, it must allow people to articulate a discourse, outline proposals, discuss them and confront them with other proposals through public communication means.

There are several classifications for democracy. This paper considers three democracy models as proposed by [As01]: quick, strong and thin. These models are based on the roots of traditional democracy and are used as a bridge between profound democratic theory and its electronic manifestations. A synthesis and later discussion of the characteristics, legitimacy, citizen's role, politician's administrative style and use of ICT's by these models is presented in Table 1.

Democracy	Quick	Strong	Thin
Characteristic	empowers people	consensus	choice efficiency
Legitimacy	majority	public debate	government responsibility
Citizen's role	decision-maker	opinion-maker	Consumer
Administrative style	limited	interactive	Open
Focus on use of ICT	decision	discussion	Information

Table 1: Democracy Models [As01]

Similarly to quick democracy, strong democracy demands active citizens, but rather than speeding up the decision-making process, strong democracy favours a slow and far-reaching involvement of people in the discussion and deliberation processes, —a situation that can be achieved in several electronic forums. While quick democracy starts from the assumption that most citizens have a critical sense of a wide variety of complex issues involving society and that decisions can be defined by the majority, strong democracy favours the development of individuals through information, discussion and debate. The strong model means not only empowering people but also providing education for the understanding of society. When people discuss social issues, a platform of respect, trust, tolerance and openness is created, and these are the essential ingredients of strong democracy. Strong democracy is indicated to conceive an e-Democracy model.

Typically, the only institutionalized channels people have to dialogue with the Government are political and administrative paths - insufficient for a participative democracy - and direct people-citizen dialogue, which is facilitated by communication means capable of turning the transmission of messages into a bilateral process.

We can identify three problems regarding democracy and citizen participation on the Internet [Wo00], namely: 1) difficulty to integrate Internet and political debate and consequently turn away from the ongoing unanimity that prevents any critical reflection; 2) difficulty to actually enter the field of politics; and 3) improving Internet applications, considering that the technical revolution did not have the expected effect on society, which means that the techniques are not efficient enough. Nowadays, traditional development of online e-Democracy follows a relatively predictable model [UK02]: organizations offer information to start with, then they add services and then attempt to add 'interactive' tools.

In order to use ICT's to effect, an infrastructure is needed to allow interaction with and access to the citizens and supporting: organization and classification (information and service); safety and reliability (electronic voting); moderation, control, quality and response guarantee (electronic participation). Implementing ICT's in e-Voting [OV04] [UK02] involves offering an electronic service package such as online voting and registration, devoting careful attention to safety, reliability and scalability. Eletronic participation represents the use of ICTs in supporting the information, consultation and participation of citizens [LC07]. Using ICT's to open new communication channels is far more complex, since it requires new relationships to be developed between government, citizens and representatives.

Those relationships in the Brazilian Government, in order to encourage citizen participation in decision-making, have been done through the Participative Budget (PB). The following section discusses this topic.

2.1 Participative Budget

In the Brazilian government model, during the electoral process, politicians present a government project. In case the project foresees a democratic and popular management, it must compromise, among others, the popular participation in the quarrel and application of the public resources, in the clear of practical administrative, in the recovery of the excluded segments citizenship of the society, in the environment sustainable development, in the preservation and valuation of the cultural patrimony and in the construction of dignity and respect to the human rights of a city.

During the execution of such projects, a significant population participation becomes necessary in the elaboration and control of the municipal public budget to consolidate the Participative Budget (PB). PB has been implemented in Brazil since 1989 in cities compromised with democratic management. Today, it is a reality in more than 140 cities.

Cities execute different methodologies looking for real citizen participation. In a general manner, PB is composed by:

- Marketing: papers and posters in the cities inform the calendar and methodology of PB in the current year;

- Council Members: represents the participants of the PB in a region or thematic, elected in an established number by the cities;

- Municipal Assembly or Forum of the PB: is the great meeting of the population to elect and/or to install the new council members of the PB and to deliver to the government, the hierarchy of the workmanships and services demanded for the cities. It's also argued themes/demands and its priority criteria and has realized a rendering of accounts.

- Participative Budget Council (PBC): space of representation and negotiation, making it possible for the council members to intervene in the debate of the municipal budget.

- Council Forum: they are regional or thematic meetings for debate, subjects of general interest. The regiment of the City Council of the Participative Budget is also argued and approved.

Garcia, Pinto and Ferraz [GPF05] analyze three prototypical attempts to increase the participation of the people and propose to create a system, the e-PPB (Electronic Participatory Public Budgeting) that simulates what an executive assistant would do, if humanly feasible, that can be summarized into five tasks:

1. Identification

- read each suggestion

- emphasize the keywords in the message

2. Interpretation

- rephrase the suggestion using the vocabulary of a predefined ontology

- classify each suggestion in one of the known themes or create new themes to incorporated creative ideas

3. Clustering

- group similar suggestions and add statistical information to the classified themes

- create an executive summary to show to the "boss"

4. Analysis

- check if there has been any executive action that has already addressed any of the provided suggestions

5. Follow-up

- send a personalized acknowledgement message to all suggestion senders with a special status note to the ones for which a government action has already been started

- keep an eye on eventual government measures that directly or indirectly make suggestions. Again, he or she would send a message advertising the measure, mainly to the ones who sent suggestions asking for that type of measure.

These are mechanical tasks that request intelligence, mainly concerning text mining activities. Technology is ready. In accordance with the tasks cited above, the authors proposed a computational helper to assist executives in listening to people's suggestions.

Some of the current Brazilian experiences use TICs to innovate the PB, however, they make use of strategies such as e-mail and voting/polls [GMP05] [MNG05] not allowing the full use of the Internet technology, and the consequence is a lack of participation of the citizens in the democratic process. On the other hand, experiences with consultative and deliberative processes, engaging citizens by using a virtual community, are being investigated [MG07].

Belo Horizonte (MG) city [BE07], has a significant experience in PB and is discussed in the next section.

3 Participative Budget in Belo Horizonte

Since 1993, the Participative Budget in Belo Horizonte has functioned as an instrument to bridge the interests of the Public Administration and the population, especially in areas with the most urgent need for public constructions and/or services, and, of course, proceeded by city planning (a crucial moment of political participation).

The PB renders effective many democratic goals and is currently, in Belo Horizonte, a biannual process, containing many steps where the population may express its intentions and deliberate on government planning. This process is noticeable for combining the participation of grassroots associations with that of unconnected individual citizens, which ends up representing a much more elevated and significant number of participants.

In 2006, the City of Belo Horizonte made an innovative achievement in the country in the field of public policy for participative democracy. Besides the already consolidated presential PB, an internet-based consulting and voting system, entitled Digital Participative Budget – Digital PB, was available for the population. Using Communication and Information Technology, the voting population of Belo Horizonte may directly, individually and equally define the public construction work that should be executed by the City, thus effectively partaking in the allocation of public spending.

This initiative was aimed at promoting the expansion of political participation, introducing and publicizing the PB to segments that would normally not get involved in its processes, such as middle class and young sectors of the population, and moreover falling upon the promotion of digital inclusion using internet resources. The Digital PB takes place every two years.

It is worth noting that Belo Horizonte, capital of the state of Minas Gerais, is the fifth Brazilian metropolis in terms of population size, which is 2.3 million. The complexity of a process involving such a numerous population was a challenge for the municipal public administration.

For the implementation of this process it was necessary to conceive a web environment projected with user-friendly interaction and communication resources and to promote the migration of the system to the Internet, safeguarding the basic premises of the participative budget. These aspects are discussed below.

3.1 Digital PB

The conception of a system with Belo Horizonte's Digital PB complexity forced the establishment of a careful methodology, as presented, and the selection of communication resources that would provide more interaction with the citizens, who are the targeted public of the application. This environment is available on [Be07].

In this sense, the following interaction and communication resources, among others for supporting additional functionalities, were defined: videos, streaming, forums, chats, contact us, public work perspectives and photographs, flash animation, news articles, weekly newsletters, and voting ballots. In this session, some of these user interaction resources are commented and illustrated:

The **forum** makes citizen-City interaction possible, allowing for the exchange and sharing of ideas, compliments, suggestions and directions. The experience demonstrated that the forum was an interesting and important means for the citizen to defend and debate the public construction works being voted. Free chats with the population also took place, permitting an exchange of ideas in real time. The screen below, in Portuguese Language, displays the discussion forum developed.
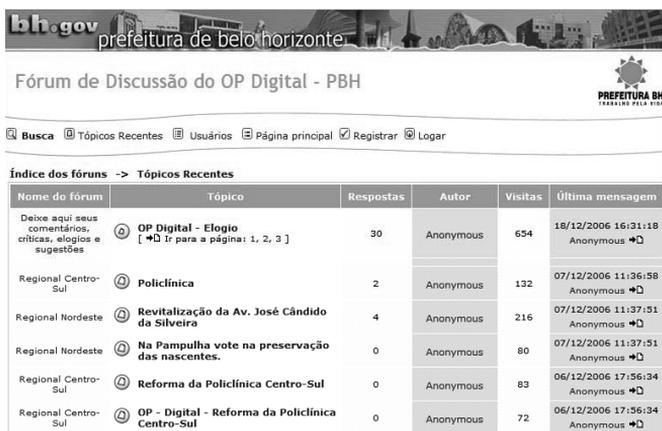

Figure 1: Forum in Digital PB

The **photographs** and **know more** allow the citizen to develop a more detailed outlook of the public constructions being debated and the subsequent voting process in the Digital PB. The menu topic, **construction perspectives** is a space created to give a future view of the construction, thus showing the before and after. See below the interface that displays pictures of the construction works.

Figure 2: Pictures of the construction works in Digital PB

The **video and streaming (DMP)** resources available in the Digital PB allow a good level of interactivity, since they synchronize voice, image, and text resources in a single application, providing a complete and dynamic overview of the construction work, besides providing accessibility to people with special needs. Streaming is a technology that permits watching the video while it is still downloading.

The **flash animations** were developed as a simpler visualization option than the videos of the construction works, geared towards the computers that do not possess the necessary resources to access the DMP video.

The **newsletter** is an electronic bulletin, by means of which the City of Belo Horizonte would send, via emails to registered citizens, information about the running of the voting process, construction works, testimonials, etc,.

In the voting stage, the citizen only needed to type the name and number of his/her voter registration in the Digital PB in order to access the ballot, which contained the list of construction works for voting. The projected interface was based on the design of a printed voter registration, as can be seen in the image below.

Figure 3: Ballot vote in Digital PB

This system was developed with state-of-the-art technology, with JAVA (J2EE) as the programming language, Oracle 10g as the database, web data security through HTTPS protocol, easy interactivity, accessibility and robustness.

With regards to system security, it is worth emphasizing that the captcha resource was used to avoid frauds (anti-robot function) in the voting screen, as well as a secure HTTPS system and certified digitals in the servers where the application was hosted.

3.2 Methodology implementation

The Digital PB project was divided in three moments: the pre-voting period, the voting period and the post-voting period, each one of them detailed below.

Pre-voting period

This period had three great marks, which are the selection of constructions that would be put to vote; the development of TIC tools and the establishment of partnerships; and publicizing the constructions to the population.

First of all, the government realized a pre-selection of 63 endeavors, seven in each one of the nine administrative districts in the city, according to criteria of social scope and relevance. After that, the COMFORCA (commissions formed by community leaders of each district, which follow and oversee the execution of the Participative Budget) were consulted for choosing 36 construction works, four per district, who would be submitted to vote. Contemplated in these constructions are the urbanization and renovation of avenues, construction/reform of leisure and cultural centers, and health center reforms, among others.

Correspondingly, partnerships were established for the project, among which began the partnership with the Regional Electoral Court. This Court provided the City with a database of all the voting population of Belo Horizonte. This database made it possible to create a solution based on the rule that limits voters to one single vote in each district, according to its voter registration; this provided more control, security and transparency to the voting process.

From the beginning of the second semester of 2006, the web system was developed for the publicizing and voting of the 36 pre-selected public construction works. By means of this system, the city's population could have access, in detail, to the information of 36 constructions, all of which have a great impact on Belo Horizonte; its responsibility is therefore to choose nine endeavors (one in each of the nine city districts) to be executed by the City.

Voting period

During the voting period, for those who did not possess Internet access, the City of Belo Horizonte installed 158 public and free voting stands in infocenters, schools and administrative agencies in all of the city's districts, with the presence of monitors to assist the citizen who was otherwise unfamiliar with the computer. Portable booths with various computers connected to the Internet were positioned in strategic places in the city during the voting period.

It is interesting to emphasize that the voting of Digital PB construction work gained so much ground that, in many locations, the community and companies installed, autonomously, voting stands; furthermore creating websites for publicizing and campaigning certain construction works, distribution of fliers in the streets, mobilizations, etc.

Simultaneously, the City launched a campaign on TV, Internet, radio, billboards, and bus advertisements in order to further stimulate political participation. Such parallel strategies are very important for the consolidation of the process. At the end of the voting process, the level of political participation in Belo Horizonte overcame the expectations, as can be seen by the data below:

• Number of voters – 172,938 (which corresponds to about 10% of the city's voting population).

• Number of votes – 503,266 (a citizen could vote up to nine times. The possibility of one vote for each district, with each district having four competing public constructions, was considered. Thus, each citizen could choose up to nine public works).

• Average votes per voter – 2.91 (the voters tended to vote more in the construction works of their region/district and less in other regions)

• Number of messages in the "Forum" – 912

- E-mails sent to "Contact Us" – 951

As a way to protect the transparency and control of the process, the individualization of votes was not held. Therefore, the profile of each elected person was not known and the vote was secret. It is important to emphasize that such information is part of the Regional Electoral Court´s database.

It is worthwhile listing the public constructions that won most votes in order to show their diversity:

- Barreiro Region – Implementation of a Sports Complex

- South-Center Region– Renovation of Praça Raul Soares (a square that holds a relevant historical significance for the city) and surroundings

- East Region – Renovation of the Medical Station

- Northeast Region – Linking the North and Northeast Regions (bridge construction and complementary construction)

- Northwest Region – Construction of a Hostel

- North Region – Construction of a Multiuse Cultural Center

- West Region – Implementation of a Medical Specialty Center

- Pampulha Region – Construction of an Ecological Park

- Venda Nova Region– Construction of an Ecological Park

Post-voting period

The nine endeavors chosen by the population of Belo Horizonte started to compose the City's construction planning, and its execution estimated for the next two years.

The City Council of Belo Horizonte´s initiative of the Digital Participative Budget was approved by its government and population. In relation to the government, the General Auditor certified the reliability of the solution, ensuring transparency and security to citizens. The population met the administrative expectations, participating actively and taking the decision collectively. It is interesting to observe that the Digital PB stimulated the creation of collective and individual campaigns in favour of the works under discussion.

Data Access

Since the publication of the PB Digital website, 195,077 visits were registered up to the voting period, coming from 50 the countries highlighted in the map below, covering all five continents.

Visitas
1 ▮▮▮▮▮▮ 193.257

195.077 visitas vieram de 50 países/territórios

Figure 4: Countries that access the PB Digital

Fonte: *Google Analytics*. Acessado em 01/03/2008.

Surprisingly, access to the system exceeded the boundaries of Belo Horizonte. In Brazil, 24 out of 27 Brazilian states registered access. Other than Brazil, where the largest visitor concentration (193,527) logically occurred, the following visits were also registered: 1,077 from the United States, 126 from Portugal, 90 from France, 87 from Germany, 82 from Spain, among other countries. This shows that the experience of Belo Horizonte exceeds geographic limitations, generating worldwide interest in this political practice. The impact of this innovation can also be noticed by the various contacts and visits that the City has received from other cities and educational institutions that seek more detailed information about the Digital Participative Budget.

It is expected that this experience can serve as a trigger for other initiatives involving popular consulting initiatives in the sphere of Belo Horizonte. In this regard, the City Council of Belo Horizonte recently launched an Internet survey so as to collect the opinion of the city's inhabitants on whether shops should be open on Sundays and holidays. Participation in this survey was successful, despite being simple. Another aim is to contribute to the enhancement of discussions and to the implementation of concrete participative democracy practices in other governments.

The large participation registered in the first edition of the Digital PB brought a great challenge: how to expand even more the participation and discussion of the public construction work in the new edition, which will take place next November. For this new edition, citizens, instead of choosing a work in each region, will vote for only one, among the 10 largest investments demanded by the city. It is expected that the experience of the first Digital PB realized will allow this public policy of popular participation via Internet to acquire even greater relevance for people from Belo Horizonte and to become a common practice, as time goes by, in the interaction between Public Administration and citizens.

4 Conclusions

Due to the growing need to include every citizen in the digital world, it is advisable to map the languages used and accepted by the public in various means of communication, so as to improve interaction with the products offered by the government. The diagnosis of current participation initiatives and the citizens' true expectations converge on the need for an interactive environment. Digital inclusion will then be introduced in effect, considering not only the need for infrastructure but also facilitating active participation from citizens in the cyberspace. This paper discusses issues in the provision of e-Democracy, in particular in participative budget.

It is noticed that e-Democracy offers benefits for citizen and government alike. The citizens can assume a more active role in society, exercising their opinion power with ease and agility. Therefore, the digital revolution means more power for the people. For the government, unable as it is to turn its back on digital society, e-Democracy allows administration gains, transparency and more control over society through Internet-centralized data.

Using web-based Technologies and rendering possible a real citizen participation in the governmental questions is propitiating one Strong e-Democracy model with consensus, public debate, opinion-making, interactivity and discussion.

The participative budget proposal discussed here received the public administration's and population's approval. As for the government, the General Auditor guaranteed that it was trustworthy, attesting to its transparency and security. The population matched up to the administrative desiderate, participating actively and reaching a decision collectively. It is interesting to note that the Digital PB estimated the creation of collective and individual campaigns in favour of the works in debate. The strategies of winning voters for the preferred projects are varied, including the production of websites, advertisements and fliers, as well as face-to-face conversations in the streets.

A challenge of an e-participative environment such as this one is the extension of the scope of discussion. In this way, a good use of registered information, for instance, is in the forums, which could be better exploited since they contain additional information about community needs regarding the public works.

A user satisfaction study, by means of public research, will be conducted in view of offering improvements to the environment. Soon the next edition of the Digital PB will be initiated and will hopefully be as successful as this first version, increasing political participation in the definition of public policies in the municipal level.

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