

QUIMBY: An Innovative Open-Source Solution for E-Democracy

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Abstract

Project eDem1.0, coordinated by the municipality of Rome and financed by the Italian Ministry for Innovation during the period March 2006 to February 2008, 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 for involving citizens in online participation in government.

The software platform 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.

In detail, the platform aims to supplement traditional means of citizens' participation in government (meetings, round tables, etc.) through Internet-based channels of communication and interaction.

The result of the work is the open source software application 'Quimby' released under the GPL license.

The main features implemented in Quimby are:

- reporting problem issues and possible solutions;
- pinpointing problems on road or satellite maps;
- transmitting additional documentation on problems or proposals for solutions;
- rating specific proposals;
- displaying graphic illustrations of the administrative procedures and status of proposals.

Initial testing of the software was begun within the framework of the Rome *Bilancio Partecipativo del Municipio XI* (Participation Budgeting of District 11). The current version is freely available under the GPL license for download at <http://www.domoticslab.it/quimby>. Other, customized versions have been provided to and used by the region of Lazio and the township of Pescara.

The software is moreover highly adaptable for use in many other contexts as well.

For example, it can be easily reused in different programmes calling for other models or levels of involvement (information, communications, consultation, collaborative planning, decision-making and so forth).

Keywords: participatory budgeting, e-democracy, Symphony, Quimby, open-source, eDem 1.0

1 Introduction

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 realize 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 (e-democracy) (Carrizales, 2008). Judicious application of ICT can make an enormous contribution to removing or reducing the obstacles and constraints to citizens' participation in a society's political process .

To promote such participation (Bimber, 2003: 197–239), the European Union has promoted a number of initiatives, amongst which, the "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 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, which 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 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 of how to renew the relationship between citizens and institution, thanks to its application of a system able to promote social inclusion, local community sustainable processes, transparency and the modernization of administrations.

2 Motivations

A number of years ago, the local administrations of *Municipio XI* (City District 11) of Rome began regular tests of citizen participatory budgeting. The online participation budgeting project exploited the experience acquired by those involved in the above-mentioned programmes 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 (March 2006 - February 2008), 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 e-democracy, understood as 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).

Supplementing “real” processes (meetings, committees, councils) with “virtual” ones (through ICT) has resulted in synergistic enhancement of participation due to the intrinsic characteristics of the new information technologies, such as interactivity, hypertextuality, horizontal communication, many-to-many relation, 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 communications, 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 favour 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.

3 The 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 widespread, platforms providing mechanisms for the collective formulation, choice and management of proposals and the 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 substantially 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 provided 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 e-Democracy.

3.1 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 accelerated. It moreover offers support for Ajax (Asynchronous JavaScript and XML, see <http://en.wikipedia.org/wiki/AJAX>), an advanced technology for the creation of

interactive Web applications.

3.2 Integrating online and offline tools

The focal point and motive force behind the participation process is the meeting of people, whether they be citizens, administrators, technicians or intermediaries.

This physical nature of such process is irreplaceable because it represents a highly rich, 'whole' experience.

Virtual participation therefore introduces an *added dimension*, whose purpose is to support, enhance and innovate traditional participation. The aim is thus to obtain a single, seamless process with two dimensions: the "conventional" (offline), and the virtual or "telematic" (online), each complementing the other.

Such integration is realized in such a way that:

- The tools and methods utilised in the various stages of traditional processes have a telematic correspondent (meetings, workgroup, questionnaires, pools, focus and watchdog groups, committees, etc);
- The online versions of such tools and methods have rules for access, participation and use based on the same criteria as the offline versions.

3.3 Application functionalities

The system is divided into for functional components:

3.3.1 Content

The Content involves the operations allowing duly registered users to raise issues and present and argue proposed solutions through the Website.

Discussions among users are organized according to the classical scheme:

- *raising issues* (users call attention to current problems);
- *proposing solutions* (users can advance proposals for their solution to each issue raised);
- *rating proposals* (users can express or amend their approval or disapproval rating of specific proposals)
- *comments on proposals* (users can post comments on any proposal).

Any *issue raised* may refer to a geographic area (district, township, municipality, etc.) and/or topic area. It may be illustrated with attachments and links to external resources, and other citizens can provide a simple expression of interest or post detailed comments.

Proposals for solution to a problem may be posted by any user, who then becomes the proposal's *owner*. Other users can express or amend their approval (and therefore support) for a proposal or post relevant comments and participate in the discussion.

Users can perform a search of the site contents based on type, geographic area, topic, time period, or other preference criteria. They can moreover signal content considered inappropriate for censoring, explaining the reasons.

The proposal rating mechanism enabling users to express their approval or disapproval of proposals or other posts also allows the system to assign a relevance score to each problem. This procedure then allows the issues to be ranked according to how important and deserving of consideration each is considered by users.

With justification, a moderator can temporarily or permanently hide potentially inappropriate content. This operation renders select content invisible to all users except those with moderator privileges.

3.3.2 Users

The most important user-related function is authentication by the system. This permits registered users to be recognized and their credentials checked; the system then assigns access privileges according to user class.

User authentication is made via standard login with “username” and “password”.

3.3.3 Messaging

The system provides for an automatic internal messaging system. This enables communications amongst users independent of traditional e-mail systems, though messages can be forwarded to any e-mail address. This mechanism allows users to exchange messages and moderators to send announcements (e.g., to advise users of newly posted proposals, comments or ratings regarding previously published content, as well as events, news regarding specific areas, blocked posts and so on).

3.3.4 Other functions

These functions are restricted to users with moderator privileges, who can send messages through the *Really Simple Syndication (RSS)* ‘feed’ system.

Some examples include events, FAQs, contact information for forwarding requests, reports and minutes of meetings, site news and so forth.

The Web server for the Symfony framework is the highly reliable, multi-platform, open-source “Apache” software (<http://www.apache.org>).

4 Platform reusability

One important feature of the *QUIMBY* software is that it has been designed and developed for subsequent easy reuse in other contexts of use (Cowan, 1995). To this aim, its development has 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 logic descriptions of the data and its structure. Such an approach avoids the need for extensive changes to the entire platform in the event that modifications are 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 be viewed as a reference point for the implementation of participatory budgeting in other e-democracy initiatives.

4.1 Motivations for 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.

4.2 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.

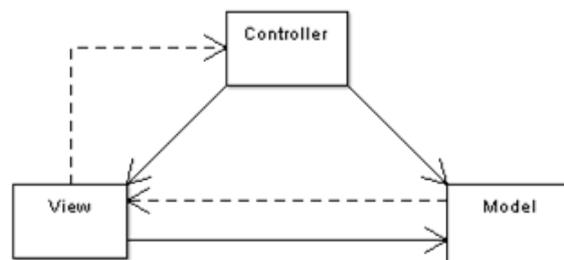


Figure 1: Model-View-Controller architecture

As represented in figure 1, 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.

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 behaviour, 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.

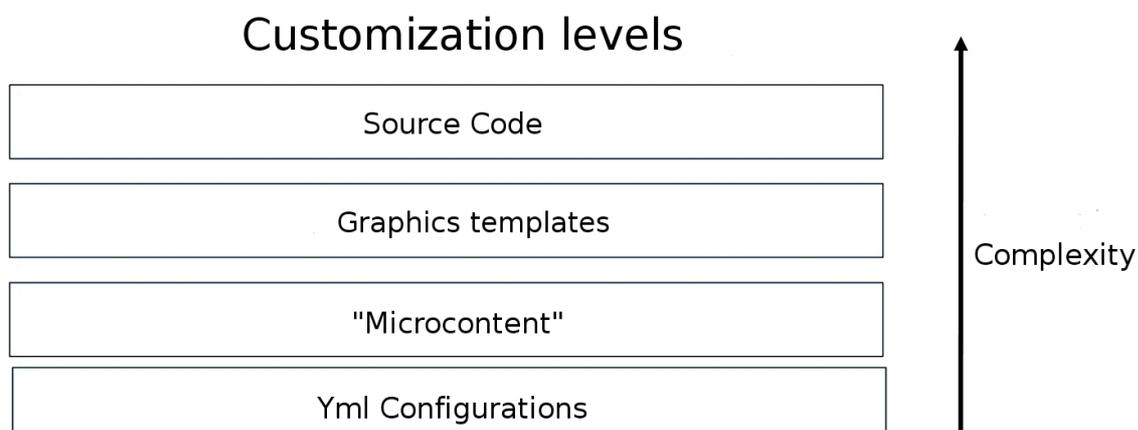


Figure 2: Customization levels

With reference to figure 2, the *yml* configuration and *microcontent* involve no modifications at all to the application code. The *yml* configuration regards the 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).

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.

5 Citizen satisfaction

An integral part of the *eDem1.0* project has been an evaluation of the project itself. This self-evaluation involved, amongst other things, checking the participation level of citizens during the test. The results have also made possible an analysis of the 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.

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 (on a scale of 1 to 5, see figure 3).

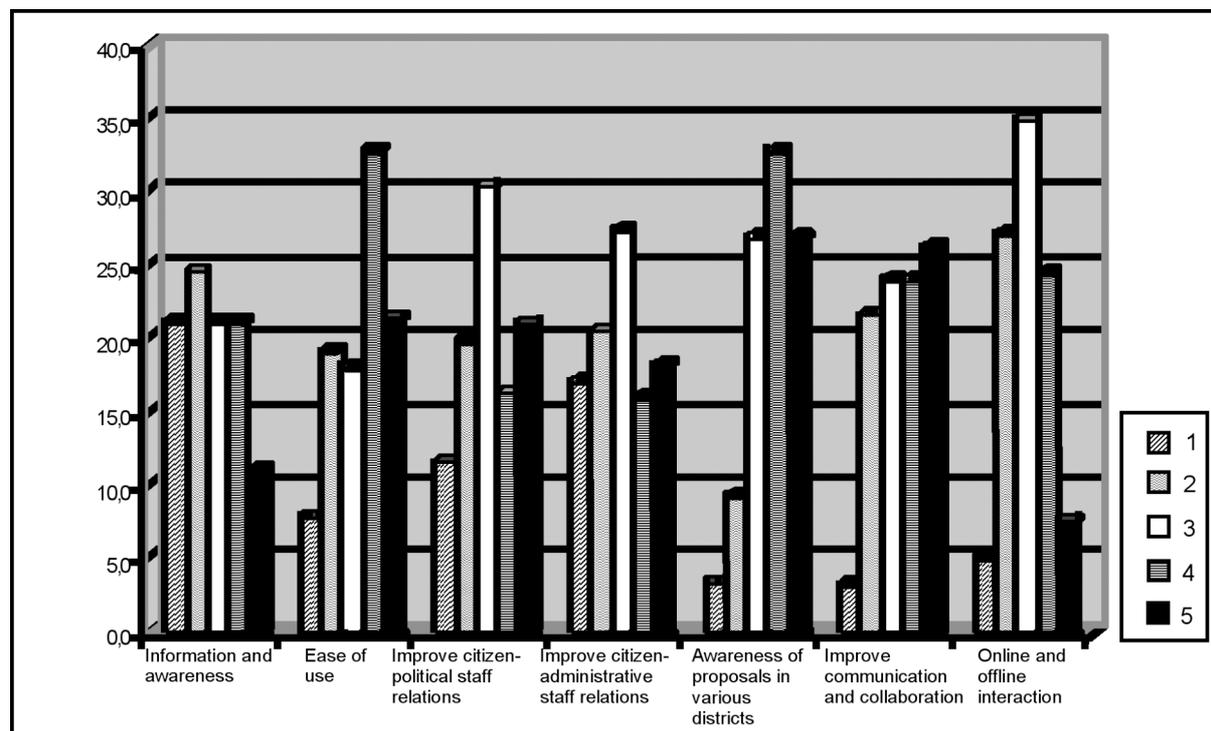


Figure 3: User ratings of the online participation

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 (Improve communication and collaboration)

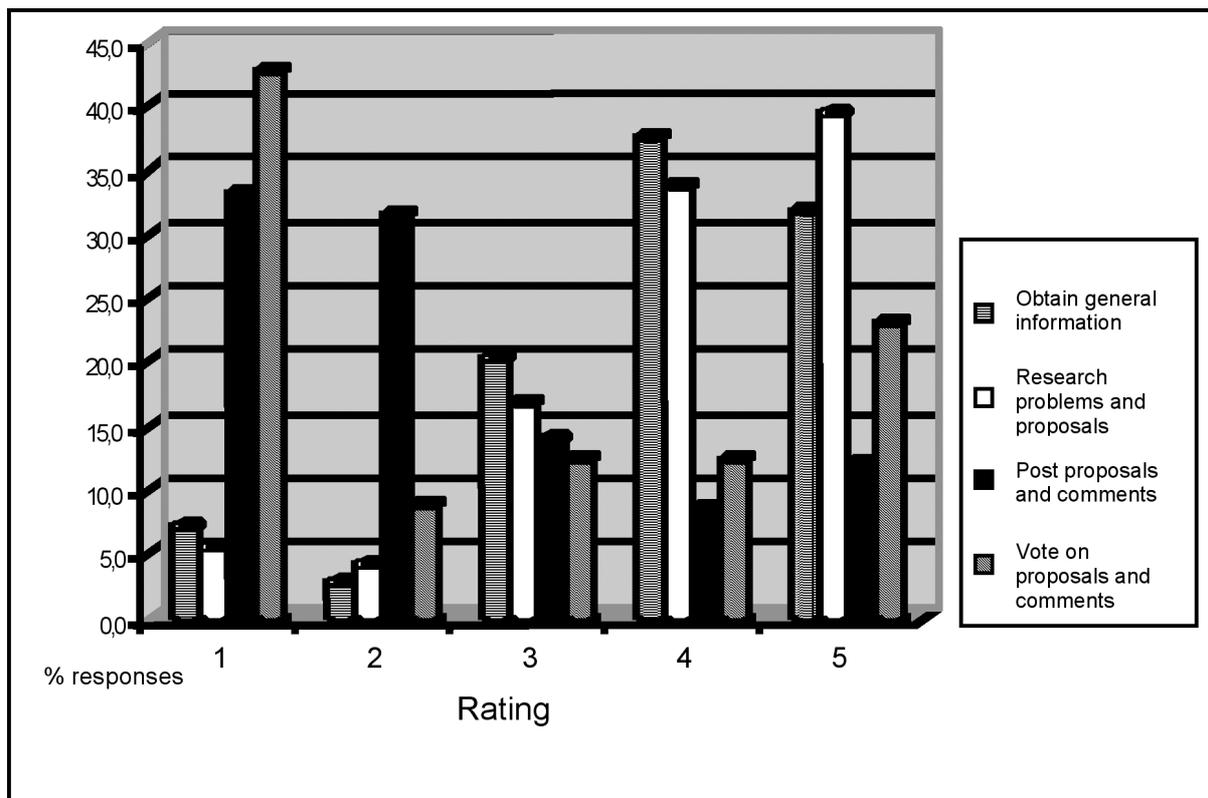


Figure 4: Reasons for using the Website

From the responses given to the questions on the reasons for accessing the site (figure 4), 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. Less frequently, the site was used to vote on proposals and posted comments, and even less to make proposals or post comments. Therefore, as seen in other surveys on citizens' attitudes to ICT, passive use of the site prevails. Thus, people 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 distrust.

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