

Web-Based Information System at the Brazilian Ministry of Finance

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INTRODUCTION

The current standard of global economic growth incorporates a disposition to undertake investments in information technology that will provide public organizations with costs reduction processes and an increase in flexibility and efficiency. The Internet technology is an outstanding case that quickly occupied a significant and increasing importance relative to the changes that are occurring at the economic and social environment. The institutional presence of the government on the Internet evolved from a simple channel to furnish information to an instrument able to aggregate, to the consolidated communication ways, new forms of relationship and supply of services to the citizen (Takahashi, 2000). This coincides with a global tendency to transform simple informative Web sites in complex transactional systems, configuring a new model to collect and distribute information (Isakowitz, Bieber, & Vitali, 1998; Marche & McNiven, 2003).

It should be considered that many times the technological infrastructure and human resources capability of the government vary widely, depending on the geographical region of the country. In function of this, the internal systems, which give support to the operation of the government machine, can be benefited through the use of Web technology, if they are inserted in the resources sharing and access distribution paradigm (McLean, 1999). Web applications development of internal scope can keep little direct relation with the universal access of citizens to public services, however, can represent the universal access to scarce resources by geographical and socially dispersed government representations.

This article reports an experience of Web technology use along the deployment of an internal Web-based information system (WIS) at a Brazilian government agency. The importance of the technology is emphasized as evidenced through development rapidity, distribution economy, and operational simplicity of the developed

system. Broader reflexes that reach the citizen are also discussed.

BACKGROUND

At the beginning of 2001, the Brazilian Ministry of Finance came across the possibility that frauds could be in course, involving civil servants who worked in its payroll administration. This fact could seriously affect the government's credibility and would certainly contribute to increase the population's disbelief in the public administration.

On that opportunity, the Human Resources Coordination of the Brazilian Ministry of Finance assigned a singular task to a group of civil servants who, at that time, worked as software developers or network supporters. The job was to develop a system to register the presence of retired civil servants so that they could demonstrate they were alive. This was necessary because some people could be taking advantage of the situation by pocketing the pensions of deceased civil servants as if they were alive. The task was a particularly challenging one because of the following reasons:

- a. The system would have to work in every state of the country regardless of the available infrastructure. This was a critical point, because some states were well known for their lack of up-to-date equipment, although all states were well served in terms of a countrywide network structure.
- b. The system's features should have an impact on the ever-watchful press, but above all, it should be capable of keeping people who plan to fake the process from succeeding in doing so. It was suggested that a digital picture should be obtained from the beneficiary. The system also should be able to consolidate real-time information about all records across the country in a single report, to which the coordinator ought to have access.

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- c. There were severe budget restrictions to buy hardware and software licenses, as well as to hire advisory services.
 - d. The system should be developed and implemented as quickly as possible. Initially, a 4-month deadline was set.
 - e. The pensioners should be summoned by mail to present themselves to the nearest Ministry of Finance office.
- b. Register the beneficiary's presence in a database and print a sort of "voucher" or "receipt" with his or her picture.

The Ministry of Finance has offices in every state of the country. In each state there are main offices in the capitals, as well as offices in other cities. All of these are connected by means of a single Wide Area Network furnished by a government company that provides communication and networking support. In principle this fact could enable some kind of solution based on a central system accessible from almost any place in the country via Internet protocol communication.

The work group was formed and formally designated to study, evaluate, and propose a solution. The technical knowledge of the members of the group included some expertise on client-server applications using Microsoft Access, query building via SQL, LAN management, and SSL/HTTPS secure connections. There were also some experts in human resources law to provide support for the definition of the system with regard to legal aspects and restrictions.

The secretariat of Planning, Budget and Administration of the Ministry of Finance, in the person of its General Coordinator, provided the political sponsorship for every necessary action approved by the group. The only real limitation concerned the acquisition of hardware, software licenses, and advisory services. Everything should be done with the available hardware and software resources and the group should find the solution on its own.

It was possible to use four high-performance servers with network operating system licenses (Windows Server 2000) and two Microsoft SQL Server licenses. As the group was formed by members from different states in the country, some travel expenses were assured for periodic group meetings. However, most of the work should be conducted through long-distance networking.

ASPECTS OF DEVELOPMENT

In fact, the system requirements were very simple. There were basically two critical transactions:

- a. Send the beneficiary's digital picture to a file repository; and

- b. Register the beneficiary's presence in a database and print a sort of "voucher" or "receipt" with his or her picture.

Brazilian law, in some cases, allowed the beneficiary's presence to be registered by a legal representative.

The available infrastructure, the resources, and mainly the know-how of the group indicated the development of a client-server application based on Visual Basic/Microsoft Access. This option was convenient due to the sound expertise of some of the members of the group in this area and the possibility of placing the system, on the server side, in reliable machines and in a very secure and redundant environment. But this kind of solution also suffered a major drawback: the client-side system would have to be installed in every workstation in which it would be required to run. This would bring about three problems:

1. Much money would be consumed for travel.
2. It was likely that many machines would present a performance insufficient to run the system.
3. Every system upgrade would have to be distributed to all the workstations in order to update them as well. As the system was meant to be developed very quickly, many bugs were expected and frequent update operations at every workstation seemed unfeasible.

In view of the above, it was proposed that a Web-based system should be developed and located in the same secure and redundant environment. The difficulty in adopting this solution was that no member of the group had any experience in the development of this kind of system. Nonetheless, easy access from anywhere in the country to a system of this sort, the fact that no installation and no updates would be necessary at the workstations, and the modest hardware required for running a single Internet browser meant this alternative was the most viable solution. In fact, some authors have foreseen that Web-based systems will change the way in which governments, which are widespread organizations, will come to distribute and collect information (Isakowitz, Bieber, & Vitali, 1998). There was also a certain pressure from the environment concerning the efforts undertaken by the Brazilian government to increase the importance of e-government services and digital inclusion projects, almost all of which were based on Web technologies.

Some members of the group, however, resisted the adoption of the Web technology, considering it weak, unsafe, and limited in terms of resources. Yet another issue was raised in order to persuade them: the shortage of time and money to provide adequate user training. The

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