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**WEB-ENABLED SERVICES AS AN INSTRUMENT FOR IMPROVING QUALITY OF
SERVICE IN PUBLIC SECTOR**

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ABSTRACT

In recent years, a previously unimaginable amount of services, goods and information have reached the common citizen through the Web. We live in an era where information is the most precious resource and this revolution has leveraged the level of services people expect from any organization. And that could not be different when it comes to services provided by governments. Several aspects involved in the effort towards e-government are discussed as well as the unprecedented opportunity for improving quality level of government services.

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1. Evolution of Information Technology use in organizations

Most large and complex organizations, both in the public and private sectors have been through roughly four phases in their responses to the challenges and opportunities of rapidly emerging information technology.

The first phase, in the late 1950s and early 1960s was characterized by experimentation with the newly developed computing technology. Operating in a batch processing mode initially, large repetitive jobs were automated to support public programs like motor vehicle registration and tax processing as well as internal operations like payroll. The success of those early applications coupled with the rapid growth of the computer industry as a whole led to the second phase, spanning the mid-1960s and much of the 1970s. This phase – the mainframe era – saw a steady increase in the number of large organizations that successfully demanded their own mainframe systems. Smaller government agencies and private firms purchased services from larger central systems that had excess capacity or from time-sharing systems set up specifically to provide computing services to smaller businesses. Those firms were known as “data processing *bureaus*”. Once a specific application had been developed, mostly of them dealing with administrative issues, like master files of employees and customers, payrolls and sales inventories, they could be easily be sold, with minor modifications, to other smaller companies who couldn’t or wish not to face such an investment in acquiring their own equipments.

The third phase, spanning the last years of the 1970s and the 1980s, has been driven by dramatic technological change – micro-electronic circuitry, and the development of microchips. As the price of computed devices went down, first minicomputers and then microcomputers made the acquisition of data processing equipment more like the purchase of a typewriter than a major capital expenditure.

In the early years of microcomputing, both the hardware and software markets were chaotic, inundated with new products and unlimited promises for ever greater and “friendlier” computing power. Experience, however, often fell short of promise and the massive expenditures for incompatible devices and technologies were a significant cause for concerns.

With the relatively late entry of IBM into the microcomputer market, an informal industry standard emerged around IBM compatibility and the MS-DOS operating system. As a result, some of the confusion was cleared away. This third phase has also seen the workforce become increasingly sophisticated in its knowledge and use of microcomputers. Some of them even started to develop small spreadsheets or database applications to meet their department necessities, creating a gap between the mainframe applications and databases and their own, generating some data duplicities.

In the fourth phase, with the development of the Internet and its sub-products, mainly the World Wide Web, there was an explosion of knowledge dissemination. Organizations, now, had to turn to their clients and build web presences that will be the front-end of their organizations.

2. General Concepts about Government Information Management

Information is the most crucial resource in our civilization today. Governments, particularly, depends on precise and timely information to perform their mission. All around the world, they maintain records about virtually all citizens and organizations with details of their finances, assets, and, in the case of individuals, health and employment history, and some personal information. This information is vital not just for performing the tasks each individual government agency is committed to, like social security and income tax proceedings, but also to implement economic policies in general.

While government information is stored and manipulated by the same technology as corporate information bases, unique issues arise from government's powers to act in the broad public interest.

At all levels, governments are actively managing information in electronic form, but at the same time the basic technology of electronic information systems are rapidly changing. Most of today's top-level managers received their education and much of their informal on-job training before wide use and heavy reliance on electronic information processing came on the scene. The information technology we will deal with ten or fifteen years from now will be substantially different in design, operation, cost, and capability than anything we can reasonably expect today.

Those who manage information technology in the public sector are like ships' captains moving toward port through strong currents and shifting winds. A wise and lucky captain chooses a course that takes advantage of those forces. Another, less knowledgeable or fortunate, is forced on a longer, more costly voyage. Those costs show up in poorly invested resources of three kind: technology, people and information itself.

There will show shortly a new breed of government information managers with skills traditionally defined in three separate domains of expertise. These are:

- ? Technical data processing skills;
- ? Traditional management skills, such as organizational and administrative abilities;
- ? And, specialized knowledge of the policy context of government operations.

Unfortunately, few today are truly skilled in all three areas. The traditional organization of jobs and functions within government means that few managers have acquired skills in all three domains, but it is precisely this mix of skills that will be necessary if governments are to manage their information futures wisely.

The contours of government information management are not well understood. Perhaps some years from now we will have definitive answers to how large and complex public sector organizations should approach the information management frontier. For now, we must be content with moving forward slowly, hoping we can at least ask the right questions and frame some interesting alternative answers. This problem happens at all levels and branches of government. Most organizations, both public and private, face similar issues requiring integrated expertise from all three domains.

What seem most needed now are forums and opportunities for professionals to exchange views and craft new strategies that synthesize the diversity of skills and insights that arise from their separate perspectives.

3. Difficulties imposed to the IT manager in Brazilian Public Sector

IT management has not been an easy task in the public sector. The speed of changes is tremendous, both in hardware and in software. On the other hand, the procurement process is very slow, due to the obsolescence of procurement legislation and its inadequacy to buy high technology products or services. If we analyze the supply of skilled technical staff, we notice that it requires a long process to obtain authorization from the federal government to organize a public examination, in order to hire new personnel. However, the few who succeed in passing the examinations and decide to keep in public service in spite of better wages paid by the private sector, are usually very competent personnel, with a high degree of formal education.

Even so, the speed of changes on technology is tremendously fast, and to keep in pace with it, IT personnel requires constant and expensive training, which is not always possible on required time, due to budget expenses restrictions. For those reasons, many public organizations in Brazil are opting for outsourcing their operations and systems development, focusing their personnel in understanding the core business of the agency.

This is also recognized as a general tendency towards a new breed of IT professionals, usually called “business analysts”. These professionals merge knowledgeable expertise in information technology as well a deep knowledge of

the users business. Although they usually do not write codes or are proficient in any particular application development language, they group sufficient expertise on IT to act as a gateway between the end user and the systems development professional contracted to build a new system or maintain an old one.

4. Overview of Information Technology at CVM

CVM – Brazilian Securities and Exchange Commission - has evolved significantly in the last 6 years. In 1994, its systems inventory consisted of a few applications developed on a mid-sized AS-400 computer. The agency struggled with scarcity of resources directed to the IT department, both human and investment on computers and software. A decision had to be made to remedy the situation.

In the last months of 1994, CVM decided to outsource the development and support of applications. The whole year of 1995 was spent studying outsourcing models and visiting firms who had outsourced their IT area, in various degrees. After an internal discussion of different models, we decided to adopt the following assumptions:

- ? Strategic planning and management would be kept with CVM
- ? Only services would be contracted, any investment on equipment would continue being made by CVM
- ? The first task of the firm responsible for the contract would be to develop, jointly with CVM qualified officials, a Strategic IT Planning, including both an assessment of the present situation and recommendations for the future

? As long as we did not know previously the exact number of application systems to be developed in the following years, nor the effort to build them, we decided to buy a basket of workmanship hours of different qualified professionals.

So, we needed to contract a specialized outsourcing company, with proven qualifications to accomplish the tasks we outlined for the next years.

The next task was to write a procurement request for proposals (RFP), in accordance to Brazilian Procurement Law for the Public Sector, know as Law 8.666. This legislation was issued in 1993, and, although aimed to contracting large construction projects, it also regulates the general process of procurement by the government, for any good or service.

It contains exhaustive rules, both for qualifying firms, writing RFPs, judging proposals and managing contracts. These rules, although written in good faith and having in mind a complete disclosure of the procurement process, somehow make public agencies go through a sluggish process to acquire the goods and services they need.

So, a RFP was written, and it was published around September, 1995. After the 90 days of publicity required by the law, in January, 1996, the proposals were open and the winning firm, having achieved the minimum number of points to qualify, was contracted in May, 1996.

Since then, a lot of investment has been done on IT. Today, every CVM employee has its own workstation with full access to the internet, an email client, a productivity suite and appropriate software. All computers are connected through Local Area Networks, in all 3 CVM Offices: Rio de Janeiro, São Paulo and Brasília. All sites are connected through high-speed long-distance links.

The old applications built for the AS-400 system were discontinued, and a whole new breed of client server, all-new applications were developed. There is still much to be done, but a long way has been gone since 1994.

CVM also runs a website, at www.cvm.gov.br, plenty of information about the Brazilian securities market. Financial statements from public companies may be browsed online or downloaded from the site. These statements are uploaded by public companies to CVM website through the internet, thanks to a joint project led by CVM and Bovespa – the São Paulo Stock Exchange.

Information can also be found on mostly every aspect of securities instruments and issues, mutual funds, public offerings registrations, auditors, CVM Investor Protection Programs and virtually all regulation issued by CVM.

The wide availability of information is regarded by CVM as fundamental for full compliance of the securities market. Recent projects include the reception of mutual funds statements and portfolio compositions, which was developed using XML technology.

5. The shift in Management Information Systems values

The first systems developed in the mainframe era were merely an attempt to automate tedious, repetitive and number-crunching tasks, like payrolls, accounting systems and stock inventories. There were few or none flexibility to extract from those systems any information that could be useful for strategic planning or for scenario simulations.

With the advent of microcomputers and the shift of power from data-centers to end-users, customer-driven areas like marketing, logistics, call-centers and others realized that much could be done to benefit the way a company interacts with their customers.

This is very important, for the real competitive advantage of a firm does not rely only on their back-office. A firm is not recognized by the efficiency with which it processes its payroll or ends an accounting fiscal year. Instead, systems that support its core businesses provide the real edge on use of technology to develop

its operations. For instance, a health insurance company may use data-mining techniques to extract from their customers and hospitalization expenses databases relationships that correlate age, professional occupancy and most frequent diseases, to better establish their real costs and, so, develop new products aimed at particular segments.

6. Governments' presence on the Web

As a natural consequence of customer-driven activities, and the advent of the internet and the development of e-commerce, nearly every business nowadays has a presence in the World-Wide Web. Their sites range in complexity from simple and static, to rich, user-interactive ones. No matter how, it is very important to be there. So have been doing the governments.

Electronic government may be defined as the use of information technology, in particular the Internet, to deliver public services in a much more convenient, customer-oriented, cost-effective and altogether different and better way. It affects an agency's dealings with citizens, businesses and other public agencies as well as its internal business processes and employees. The e-government movement is being driven by the need for government to:

- ? Cut costs and improve efficiency
- ? Meet citizen expectations and improve citizen relationships
- ? Facilitate economic development

While many agencies have made great efforts to reduce costs, too often this has come at the price of cutting programs. Today, agencies are under pressure to save money while maintaining or even increasing their level of services to citizens

and businesses. By using the internet, the cost of processing transactions is greatly reduced, with savings in paper and printing, mailing and personnel. Furthermore, the overall productivity of the all playing actors gets a boost, simply because all the necessary information can be reached with a few keystrokes, freeing their time for other activities.

Online transactions can streamline processes and lead to greater efficiencies with less human interaction. One of the primary reasons for inefficiency is that the basic model of government remains entrenched in the industrial age with a continued reliance on the centralized mass production of public services delivered through vertical channels. Citizens today have diverse needs that must cut across the underlying structures, so the internet can be used as a collaboration tool for employees and departments.

The most publicly visible way for the internet to improve the public sector is through its ability to reduce the time and effort required for citizens and businesses to comply with government rules and regulations. As people become aware of the power of the web and experience good service in the private sector, they will become less tolerant of poor, impersonal service in the public sector. If people can buy an airplane ticket over the internet, they will want to renew their vehicle registration the same way. If they can go online to check how their stocks are doing, they will want to go online to check their medical records. In the digital age,

public services need to be instantly accessible, around the clock, from home or work.

7. The Concept of Citizen-Relationship Management

Every government agency, in all levels, relates with at least 3 external entities: Citizens, Businesses and other Government Instances. For each of these entities, a nothing-less-than-total quality level relationship is expected. How to accomplish this task, with such a multiplicity of relationships occurring every day ? How to keep track of each of them, and know how well they were serviced ?

This lead us to the concept of CRM – Customer Relationship Management. The central idea here is to know your customer, to keep track of your relationship to better service him, making each contact a pleasant experience, thus maintaining an overall competitive advantage and making him always wish to come back.

This idea in not new at all, and it has been practiced by small business since the turn of the 19th century. The owner of the old warehouse our grandfathers visited, for sure knew each of his customers by their name and probably greeted personally them when they came into the store. He probably also knew their preferences and, most probably, would also used to give them credit and payment facilities.

With the expansion of businesses, as well as the number of customers, this personal relationship became impossible to achieve. A new era, of mass-market consumption was born, and customer relationships became un-personal.

Today, with the advent of Internet, the explosion of e-commerce and the always-dropping price of computing power, businesses have again the opportunity of redeeming the personalization of the relationship with their customers.

Many e-commerce sites, like Amazon.com, have successfully implemented their CRM projects. Why should not governments follow the same way ?

Of course, government actions must follow some rigid principles, and they have to be impersonal, in the sense that a rule or legislation must be applied the same way in every case. But that does not mean government agencies should not keep track of the relationship they maintain with every citizen, business or other agencies. Not only should they keep track of this relation, but also permit their customers (the three previously mentioned) search their relationship historic, know when their demands should be attended, and provide them with an abundance of information.

We will discuss now some of the challenges involved in each of those relationships – government, citizen and business, and, for that purpose, we will use be adopting some of the acronyms widely used in the software industry:

7.1. Managing G2C (Government to Citizen) Relationships

This is by far the most crucial of Government relationships and, for sure, the one by which an administration is judged. With most private service running online today, why should government force citizens to stand in log lines during their lunch hours, to apply for service that could be easily handled by well-designed web services ?

People's perceptions of government are based largely on this kind of interaction with bureaucracy, and most see dealing with government as a dismal experience, somewhere below having to look after your neighbor's cat. Either you're confronted by an unresponsive, static-answering bureaucrat, or you're put into an endless telephone loop. You're told to fill in a form A by hand and then some other agency will require you to provide the exact same information all over again on form B. You stand in line for hours just to be told that your documentation is incomplete. Then you're told to conclude the transaction at another government office clear across town. That office closes at 5 PM and there's no way you are going to get there in time. So you'll have to take time off work the next day as well. All of this to accomplish a simple task like renewing a car registration. People value their time too much to put up with the hassles of a slow and unreliable public service.

If you can buy a new TV set from an online dealer in no more than 10 minutes, who should you wait in long lines for government services, especially when you fund it? So, the pressure for more and high-quality government services increase every day. We can expect in the future that we only need to go to a government agency when it is absolutely necessary. Otherwise, if a service can be available online, why should it not ?

Transit department agencies usually provide a quick and easy barometer for the effectiveness of the public sector because so much of their work is devoted to paper processing, document handling, and error correcting. They are also in direct daily contact with the public and are normally characterized by long queues and unanswered phone calls. But a growing number of such agencies are turning to the internet to make themselves more customer focused and to give people a faster, simpler and more convenient way of doing their government business.

In Brazil, at Rio de Janeiro State, the local transit department agency, DETRAN-RJ, has made available online or at its call-center a number of services that had previously to be performed by the citizen during hours of long-waiting lines. This, in particular, was one of the most criticized agencies at the state level, with incredibly soiled bureaucracy and a lot of unauthorized persons trying to sell their services to facilitate the flow of one's business inside the department. A lot has change in the last years and, if you can still not get every service online, the agency is a good example of improvement on citizen services.

Another important point is the ability for citizens to communicate with government. If it happens that you do not live near a branch of the agency that provides the service you need, how can you reach them ? Telephone has not been proven to be an effective way. The answer, again, is on internet. People should be able to find their answers from home or work. If for some extraneous circumstance they can't, then they should be able to send an inquiry from their desk. Citizens ought to be able to communicate with government any way they want, and in the digital age most will want to communicate through the web or by e-mail. Public-sector agencies often already have performance targets for handling communications by mail, phone or fax. These should be extended to cover online inquiries.

Rather than apply the basic private-sector consumer-choice approach of who should provide a public service, the emphasis today is on giving citizens and businesses a choice of where and when they can access public services. Banks, supermarkets, travel agents, and dot-coms are making services and products available around the clock, so why shouldn't government ? Increasingly, people want to access public services "right there, right now". Right now is any time – 24 hours a day, 7 days a week. Right here is from any place – home, work, school, or the palm of their hand.

Of course, to make government services available around the clock, some changes to public personnel legislation has to be done. A web-site, if supposed to

run 24 hours-a-day, must have, besides qualified technicians to handle emergency situations if the site goes off-line, but also authorized officials that can be contacted or available promptly in case a crucial decision has to be taken. In Brazil, for instance, present legislation prohibits public personnel working after normal office-hours, as an expense-cutting measure. It is very important to stress that behind every computer system solution there is also an organizational situation that has to be worked-around, so everything works fine.

The cost of developing online services is modest compared to other delivery channels, and the marginal cost of someone accessing a website is virtually zero. Using the internet won't just make people's live easier, it will change the way they think about government: Modern rather than institutional. Efficient rather than bureaucratic. The web has the ability to reinvent government in a way that nobody could have imagined in the early 1990s, and in a way that matters most to the citizens and businesses who receive public services and to the taxpayers who pay for them.

7.2. Managing G2B (Government to Businesses) relationships

It is inconceivable today that any company sales representative would hand out a business card that didn't include a website and email address. Even the smallest firms these days use computers in their professional activities, and most of them are connected to the internet. Companies are adjusting their strategic thinking to conduct business-to-business e-commerce and are finding it useful for quickening their turnaround times, lowering costs, keeping inventory, tracking orders, anticipating the next requirement, upgrading systems and planning maintenance. If only they could also use the web to reduce bureaucracy and simplify their transactions with government, their e-business life would be complete. The earliest e-gov successes should come in dealing with the business community, because here government has a captive audience.

People don't like standing in line in their jobs any more than they do in their free time. Rather than driving down to city hall to fill in forms, a building contractor would find easier to apply for and receive building permits over the internet. Public-sector efficiency is especially important to businesses in areas of the economy where government must be involved through regulation or the provision of infrastructure. This is specially the case in international trade where, in the age of economic globalization, the clearance of consignments at border has become a time-sensitive matter. Industry places a growing importance on express and just-in-

time delivery systems, yet customs checks remain a lengthy process requiring much effort and incurring costs for both government and trader.

7.3. Managing G2G (Government to Government) Relationships

Encouraging the public and private sectors to work together is one thing, but trying to get two governments departments to sit down and cooperate is another matter entirely. Interdepartmental politics means that civil servants are employed to protect their minister's (and, therefore, their own) interests, which often requires running down other departments. Counterproductive disputes between federal, state or local levels of government arise constantly. Government employees work in a culture where information is considered an asset best kept to oneself. Every public-sector organization has its own work methods, business processes, rules, and procedures. Mass produced, one-size-fits-all public services are delivered uniformly through vertical and rigid production lines, provided for the sake of administrative ease rather than public convenience – an evidence are the opening times and location of public offices, the demands that departments make on citizens, and the help they do and do not provide.

This all too familiar model of government was designed for postwar industrial society when everybody had the same basic requirements for public education, healthcare, housing, social security and so on. Vertical departments

were created to oversee every task and each of them just did their own job. There was no need to collaborate.

Society, however, has changed. Today's communities are multicultural, multiracial, and more conscious of age, religion, gender and subcultures than ever before. Social problems are complex and people's needs no longer fit into departmental compartments. But still government respond to new challenges but putting in more procedures and more production lines, to the point where agencies today find themselves floating in a vast sea of public and private, semi-public and semi-private organizations, all with ever-increasing staff levels, duplication and overlapping responsibilities. As a result, a small business owner might have to entertain a dozen public inspectors during the course of a year and fill out two dozen or more forms. Well-intended policies may have unforeseen consequences, since different agencies act own their own. Incapable of working together to address either the big picture or an individual's specific situation, and working with obsolete systems and methods, civil servants are left exposed to ridicule and accusations of incompetence and inefficiency.

Ultimately, government will have to destroy their vertical, industrial-age organizational structures and instead present themselves horizontally on citizen's life events. This is already occurring to a limited extent: the might be an office for small business or a social exclusion unit. These are small organizations relative to their importance and the big vertical departments still prevail, but efforts to streamline processes and alleviate duplication and inconsistencies will force

governments to think beyond internal organization issues and look at problems from the point of view of overall information flows. The wide availability of data is pushing government departments to cooperate more along value chains and provide linked service packages. In time, this will encourage them to match their internal procedures, allowing for even greater collaboration and joint-ventures between departments, between different levels of government, and between the public and private sectors.

There are hundreds of reasons for the pace having been so slow so far. Some bureaucrats don't want to give up their pretty kingdoms, others simply fear change. The way government budgets are negotiated department by department means that organizations devote their efforts to maximizing their internal funding rather than considering how they can deliver actual results. The system encourages mediocrity and aversion to risk, with both government staff and ministries operating in an environment where the rewards for success are limited and the penalties for failure rare but harsh when they are handed out. Citizens can express dissatisfaction through voting, but this is not the best instrument. Removing a government because you are tired of standing in line doesn't address the underlying reasons for the service being bad.

Computer systems have been part of the problem because they were never built to provide a holistic view of data, knowledge, and resources across an administration. When bureaucracies first started to apply information technology to their work, their old procedures and processes were simply encoded into the

software. Huge, mainframes-centered systems cemented the old way of work and even added to the bureaucracy, since more people were needed to implement, maintain, and operate the complex systems. Information has become inaccessible, locked away in thousand of disparate departmental systems. Every government agency has its own IT department, with its own policies, strategies and some standard computer configurations. And standards within departments often go unenforced, with most agencies. Any employee who uses a spreadsheet software, for instance, that's different from the agency standard, will require special training and support attention. Most of all, data this specific user is maintaining within his spreadsheet will be more difficult for other employees to access. Whenever a standard is breached, there are on-going and unrecorded expenses.

Information technology should serve to unify rather than disconnect government's organizational structures. Productivity tools should function with business applications, allowing employees to work in a predictable, consistent manner. People should be able to move smoothly between working on a document, surfing the web, and accessing databases on a variety of back-end machines. If government's applications are allowed to go online, people will need multiple logins and passwords to access transactional services on different websites, none of which will have a common look and feel.

In spite of this difficulty, however, imagining a single login and password to all government services, even if the concern of joining such a huge number of databases could be overcome, would impose a great risk to privacy. Anyone

gaining access to another person's password, would also gain access to a multiplicity of private information, including the risk of altering it.

8. A little bit of technical talk: interconnecting different systems

Connecting computers isn't easy. Normally, an application program interface such as an Electronic Data Interchange (EDI) system is required to access and download data from an incompatible computer. This makes necessary custom programming every time two systems need to connect, which means painstaking mapping of one data field on to another and skills that take time to master. Then the interface has to be altered again when data in one system changes. Consequently, programmers spend all their time developing interface between applications and ensuring that they work properly rather than working to improve the systems themselves. Or they just throw the whole thing away, especially if it wasn't Y2K compliant anyway, and buy something new. But replacing systems can also get expensive.

As countless information-age visionaries have said, the internet changes everything. For IT departments, this means they no longer have to spend all their time and money interfacing and replacing legacy systems. Now, aging, but still functioning mission-critical applications can be "web enabled". A graphical user interface can be added on the front-end and be made more widely accessible to government employees over an intranet, to external partners over an extranet, and

to citizens over the internet. Governments, within certain reasonable and secure limits, should web enable and connect everything they have, leaving no computer to stand alone. Even the most technologically advanced program will fail if it is operating in a vacuum, if the data is isolated and can't be leveraged across a department or across government.

To ensure a coordinated approach to system integration, governments need to be "net ready". This involves publishing a comprehensive e-government plan that adopts commercial open internet standards across the board. There should be a manageable schedule and it should have top-down support from ministers and senior management. Unlike in the past, when each department set its own IT priorities, an e-government plan needs to be a corporate strategy, covering all of government's infrastructure, all online applications, and all governing policies. Developing and implementing a government-wide strategy will require collaboration among agencies, since they are the best placed to determine what is and isn't feasible from a user's perspective, and among IT industry, since it is best placed to determine what is and isn't feasible from a technical perspective.

9. A new standard to data interchange

Extensible Markup Language (XML) is emerging as the natural extension of the Internet. It is a standard ratified by the World Wide Web Consortium (W3C) to provide a mechanism for representing online text data from otherwise incompatible

systems. This web-based authoring language is expected to become the primary data-interchange method for all systems, because it can be applied to just about any application and isn't limited to databases. Users can create and share

documents running on any local or wide area network, helping governments to integrate applications on their mix of legacy mainframes, client server, and web-based systems. With XML, whenever a computer application receives a file, it includes codes that describe what the data actually means – whether it's a person's name, an address, a file number, or whatever – and how it can be exchanged between servers and clients via a network. XML together with XSL (Extensible Stylesheet Language), a scripting language used to transform and display XML documents, is much more adaptable than HTML and is considered an interoperability standard because of the language's self-describing nature and platform neutrality.

Generally speaking, any reasonably skilled programmer can become proficient in XML in a matter of hours. Where it takes six months to implement an EDI interface at a cost running into hundreds of thousands of dollars, a comparable XML system can be implemented in weeks for a few thousands. It is the key to enabling online transactions and transferring large amounts of information without the laborious task of converting data structures. Despite wide support from the IT industry, including such vendors as Microsoft, IBM and Oracle, public administration is still a bit cautious about it, although it does have been included in a few pilot projects.

10. The problem of privacy

Connecting all government systems also imposes a big risk to personal privacy. One of our safeguarding situations is that citizen's data is fragmented between an array of government agencies. Privacy defenders state that it should be kept this way, and this is quite a respectable point-of-view. Governments, above all, are formed by human beings. They have their failures, greed, and, above all, a great crave for control.

Suppose that every citizen receives an unique number when they are born and under this number every conceivable information about this particular person is collected. Suppose, also, that when a child is born a microchip is implanted under her skin, for the sake of storing medical information. Such a chip can be scanned and localized by an array of low-orbit satellites. This is actual technology and perfectly achievable today. What kind of use could be made by a dictatorial government of such a device ?

Even democratic governments should not be permitted to use such a technology. A government to be efficient does not have to oversee every person, otherwise we would be living George Orwell's worst nightmare, expressed in his "1984", a definitive literary work on the abusive power of technology and the loss of privacy resulting from living in an overly transparent society, with a Big Brother watching constantly on every citizen.

11. Digital Exclusion

One of the greatest concerns on developing and under-developed countries is the so-called Digital Exclusion. In most developing countries, no more than 15 percent of the population has access to the Internet. We can surely say that, in these countries, the vast majority of the population is computer-illiterate, Even if they could reach a computer, they would not know how to use it.

No Web-enabling initiative, no e-government program will be fully effective if it does not reach most of the population. Some efforts have been made, both by governments and non-government organizations, to relief this situation, but a lot has yet to be made. After all, in most developing countries the top priority is misery banishing and employment programs. Once those goals are achieved, we will have a more equal and longer reaching distribution of e-government initiatives.

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