Building Web Apps to Improve Transparency, Accountability, and Prevent Corruption: A Brazilian Case Study

Bárbara Luiza Coutinho do Nascimento, Patrícia do Couto Villela

Rio de Janeiro State Prosecutor's Office, Rio de Janeiro, Brazil

barbara.nascimento@mprj.mp.br

patvilel@mprj.mp.br

Abstract

In Brazil, the Prosecutor's Office has judicial and non-judicial constitutional functions. The excessive demand for repressing corruption led the Rio de Janeiro State Public Ministry to try a different approach: to develop two web apps called Citizen-Manager and Building Internal Control that aim to prevent corruption from happening and not just keep repressing it indefinitely. By creating, providing, and using online anti-corruption mechanisms, the institution elevates transparency, publicity, and, as a consequence, accountability to a new degree, since it becomes an instant universal tool. Prosecutors and public servants may use the apps to facilitate the exercise of their duties. However, the citizen is also empowered because he gains easy access to a comprehensive range of public data. Also, the web apps reveal the work of anti-corruption institutions, allowing people to oversee it. It is expected that this process will foster public trust. The information is reliable and unbiased due to the characteristics of Brazilian prosecutors. Notwithstanding, the publicity allows the user to question and audit the database. By disclosing this kind of information on the Internet, poor governance and malfeasance are exposed. Therefore, it is also expected that politicians will not want

to have their image linked to such bad publicity and will work to enhance compliance, which will, in the end, deter corruption. In this context, the paper will: (a) address two key conceptual issues (I - how e-government can enhance good governance; II - the advantages of anti-corruption mechanisms online compared to offline tools); (b) present the web apps mentioned; (c) establish a relation between the concepts and the apps; (d) identify ways in which web apps can be used to effectively prevent corruption from happening.

The opinions expressed and arguments employed herein are solely those of the authors and do not necessarily reflect the official views of the OECD or of its member countries.

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1. Introduction

The Internet has become a relevant element of contemporary citizenship. Many aspects of a person's life encounter an online representation. The user accesses the web for all kinds of public and private services. Consequently, the individual constructs a digital identity that reflects his personality and uses it to interact with other people virtually.

In this sense, the Internet has dramatically affected our notion of connection and the way we see each other (Habacon 2008). Therefore, the impact of this technology on society cannot be ignored by the public sector, especially when it comes to promoting democracy, good governance, and fighting corruption.

However, how can the exercise of citizenship on the Internet go beyond tweeting protest statements? What kind of platform can be built to prevent corruption? Can it engage all stakeholders?

This paper will explore those questions by analysing two web apps built by the Rio de Janeiro State Prosecutor's Office, called Citizen-Manager[1] (Cidadão Gestor 2017) and Building Internal Control[2] (Edificando o Controle Interno 2017), that intend to be corruption-prevention mechanisms.

2. E-government as a good governance enhancement tool

Good governance for the public sector demands the strategic planning of a government that wants, can, and knows how to achieve results in favour of the public interest (Pereira Jr. and Dotti 2008), such planning being qualified by transparent and participatory decision-making processes, fiscal responsibility, and accountability.

The 2014 OECD Recommendation of the Council on Digital Government Strategies defines that E-Government refers to "the use by the governments of information and communication technologies (ICTs), and particularly the Internet, as a tool to achieve better government" (OECD Council on Digital Government Strategies 2014).

The recommendation goes on and defines that "digital technologies refer to ICTs, including the Internet, mobile technologies and devices, as well as data analytics used to improve the generation, collection, exchange, aggregation, combination, analysis, access, searchability and presentation of digital content, including for the development of services and apps."

When putting those three concepts together, we can conclude that, by nature, e-government is a good governance enhancement tool.

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[1] http://cidadaogestor.mprj.mp.br/
[2] http://apps.mprj.mp.br/sistema/eci/

When correctly used by the public administration, digital technologies add transparency and visibility to the State's actions and policies because data and information are made more broadly available and accessible with pinpoint searches.

For example, good governance is nonexistent when official publications are hidden, have restricted access or are forgotten in the dusty files of public archives. When data are inserted and maintained online, these problems dissolve. By bringing public services to the virtual world, physical distance becomes irrelevant in such a way that the administration becomes closer and more open to the citizen. Using the web as a channel of communication enhances the interaction between each person and the State.

Also, digital disclosure of public material fosters the people's trust in their government since accessing information online facilitates the control over State officials and policies as well as enables stakeholders to question and audit the reliability of the disclosed data.

Therefore, governments must work with ICTs to achieve the results society demands from them, accomplishing good governance.

3. The advantages of online anti-corruption mechanisms compared to offline tools

In this context, the virtual world offers benefits for fighting corruption when compared to traditional methods.

The digitalisation of life not only alters the quantity of information disclosed and the costs of disclosure it, but also alters its characteristics. In other words, digital information has qualities that make it different from material transmitted via radio, television or writing. First, it circulates faster and farther since once inserted online, people from all over the world will be able to access it instantaneously. The mediation of the traditional media will not be necessary. Second, it stays online until it is erased. Third, it becomes readily findable.

It must be remarked that the relationship between information and democracy is fundamental. Social control is inherent to the democratic regime, and it depends on access to information concerning public officials and affairs (Barcellos 2015).

Thus, as stated, the web shortens physical distances and, as a consequence, reduces time and costs both for the citizen to report corruption and for the control agencies to exercise their duties, communicating with each other faster, receiving whistleblowing, and finding information not only about contracts and transactions but also about investigated persons and their networks of relations. The Internet opens the books of people's lives.

Besides, when data of public interest are inserted online, allowing immediate, ample, and unrestricted access to them by any person, the principles of transparency and publicity gain effectiveness, and the citizen becomes better informed. Additionally, the user is able to oversee the

activities of those institutions that have the task of fighting corruption, fomenting accountability. Therefore, citizenship as a whole is fostered.

In this sense, considering the role that the internet occupies in society today, using it to develop tools that aid the aforementioned institutional obligation represents a significant gain in coverage, publicity, transparency, and accountability when compared to traditional anti-corruption mechanisms.

4. The Rio de Janeiro State Prosecutor's Office apps: Citizen Manager and Building Internal Control

First, it is noteworthy that Brazil, occupying 8.5 million square meters (IBGE – Agência de Notícias 2012), and with a population of over 207 million people (IBGE 2017), is a three-level federation. The Union is composed of the Federal government, twenty-six States, one Federal District, and 5,570 Municipalities. As a consequence, each one of the 5,570 Municipal units has an autonomous budget. The fact that the political power is so decentralised, diversified, and vastly distributed makes control difficult.

In the era of the car-wash operation, which reveals complex corruption schemes rooted in various Brazilian institutions, the demand for efficient and effective anti-corruption mechanisms seems to be endless. The country's Constitution and legislation design institutional arrangements for this purpose, and a crucial part of this system is the Public Prosecutor's Office (also called Public Ministry), which is divided into two levels: federal and states.

In Brazil, law bachelors with three years of experience may apply to become a prosecutor by taking a highly competitive public exam, which includes both written and oral phases. Once sworn in, they have constitutional guarantees and cannot be arbitrarily removed from a case or have wages decreased. Also, after two years of exercise, they cannot be dismissed unless they are convicted by a court of law. Those characteristics ensure that the prosecution body will be independent and unbiased, selected by technical skills among highly qualified professionals.

Prosecutors work not only in criminal cases but also defend the environment, the children, and the elderly, control public policies, and pursue condemnation and reparation for administrative misconduct, malfeasance, and damage to the public estate.

The protection of public property is, simultaneously, a constitutional power and a duty of the *parquet* due to the express provision in article 129, III, of the Constitution[3]. On the one hand, it is a power because the institution has the authorisation and the means to act, and on the other hand, it is a

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[3] Art. 129. The following are institutional functions of the Public Ministry:
(…)
III - promote civil inquiry and public civil action, for the protection of public property and social heritage, the environment and other diffuse and collective interests;

duty since it is not a mere option but a binding command with responsibility for omission if nothing is done. There is, therefore, a mandate to act not only repressively but also preventively, using the necessary means to do so.

In this context, the Rio de Janeiro State Prosecutor's Office (*Ministério Público do Estado do Rio de Janeiro*) has developed two web apps called Citizen-Manager (*Cidadão Gestor*) and Building Internal Control (*Edificando o Controle Interno*) intended to be corruption prevention mechanisms. Both are hosted at the institution's website.

4.1. Citizen-Manager

The first app lists the lawsuits by municipalities and calculates the total amount of money currently claimed in court by local prosecutors against public and private agents accused of corruption or damaging the treasury. The app allows citizens to simulate how that money could be spent on public policies such as building schools or hospitals, thereby revealing the true cost of corruption.

Analytically, the Citizen-Manager project has three complementary fronts of action.

The first one is composed of an interactive map in which all the Municipalities of the State of Rio de Janeiro, along with the State itself, are geographically represented. To each entity is assigned a graduated colouration, which goes from light shades to deep red, according to how the Public Ministry of Rio de Janeiro observes the deviations and misuse of public resources.

On this front, the app demonstrates individually the actions that the prosecution body has been carrying out in the non-criminal defence of the public patrimony - material and immaterial - concerning the federative entities subject to its control. The platform allows the citizen to search for the lawsuits moved by the Rio de Janeiro Prosecutor's Office itself due to the practice of administrative misconduct or damage to the treasury, requesting the reimbursement to the public coffers of the loss verified, by city. The app, then, discriminates the amount of damage caused to the exchequer claimed in each public civil action, as well as the defendants to whom impugned behaviour is imputed, including the beneficiaries. The user can also consult the progress of each case on the website of the Court of Justice of the State of Rio de Janeiro. In the end, the app calculates the totality of funds involved in the actions, making transparent the overall amount resulting from poor public administration or corruption.

On its second front, entitled Manager for a Day, the Citizen-Manager project allows the user to take on the role, virtually, of a public administrator. Virtual actuation simulates investments in a previously selected area of public policy which aims to fulfil the fundamental social rights inscribed in the Republican Brazilian Constitution of 1988, such as the right to health, education, social assistance, culture and leisure, sanitation and housing. The amount available for the user to apply is the sum of the values attributed to the causes in the lawsuits previously discriminated in the first front. This way, the app allows the citizen to visualise, employing numerical and empirical representation,

how that federative unit ceased to develop both its infrastructure and social care because of poor public administration, which is characterised not only by the wrong choices but also by the undue diversion of public resources.

In the last step, after the appropriate simulations, the app uses concrete examples to inform the citizen about the assets (equipments, services, and constructions) and instruments of the elected public policies he chose to improve the lives of his community that could have been acquired for the enjoyment of the social group, but were not. For example, the platform reveals how many hospitals, schools, ambulances, old-age academies, social houses, etc., could have been implemented if the manager had carried out public management with republicanism and integrity. The graphical representation of this front comprises geopolitical information about the respective municipality, as well as annual budgetary data, for knowledge and citizen's weights.

Still, on this second front, it is worth noting the creation of the Citizenship Development Indicator of the Public Ministry of the State of Rio de Janeiro (IDC-MPRJ). It was created with the purpose of demonstrating the damage to the improvement of the quality of life caused by inadequate public administration, visualised through numerical gradations. Its formula was built based on the annual budget data of each municipality and respective Municipal Human Development Indexes (IDHM). Each federative unit has its starting IDC-MP, which will increase after the simulation performed by the citizen, using the once poorly administered values for fundamental public policies. The increase will have multiple variations considering the quantities of different areas contemplated by the respective simulation.

Lastly, the third and final front entitled Report Here (*Denuncie Aqui*), establishes a direct, facilitated, and transparent channel of communication with civil society. The app allows the citizen, after reflecting on the theme, to report online any irregularities in the public administration of its municipality or state. The complaint is sent to the Ombudsman of the Public Prosecutor's Office of Rio de Janeiro and, afterwards, is distributed to the local prosecutor who is obliged to analyse it and present an answer.

4.2. Building Internal Control

Aspiring to combat public corruption preventively, the project entitled "Building Internal Control" finds its legal basis in the *caput* of article 74[4] of the Brazilian Constitution of 1988, which governs the obligation to maintain such a mechanism for monitoring public management.

The second app ranks municipalities by their levels of internal control maturity. To calculate the level, the elements used are audit, ombudsman, internal affairs, controller, transparency, collaboration with external control, structure, comprehensiveness, autonomy, regulation, budget,

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[4] Article 74. The Legislative, Executive and Judicial Powers shall maintain, in an integrated manner, an internal control system with the purpose of: (…)

planning, evolution, extension, implementation of public policies, and praiseworthy initiatives. By choosing these as the elements to demand, the project aims to fortify integrity.

To accomplish this task, the Prosecutor's Office performed a general diagnosis of the internal control organs of the ninety-two municipalities of the State of Rio de Janeiro and inserted the data collected in a digital platform.

The platform analyses the stage of the internal control structure according to the sixteen analytical areas mentioned above, assigning a grade to each municipality in each area, and, for the final grade, imputing different weights to each area according to its relevance and efficiency in the field of study.

The system then classifies the stage of internal control of each municipality according to the total grade assigned in (1) built, (2) finishing, (3) advanced construction, (4) construction started, (5) foundation, and (6) design.

Finally, the system compiles a ranking among all the federated entities involved whose positions are determined by the global scores earned. The app also allows the composition of partial rankings, taking into account only one of the mentioned analytical areas.

Annually, new monitoring is carried out to have a history of the internal control of that entity. It is verified if there has been an improvement and to what degree, the sectors that have benefited the most, and also any irregularities, deficiencies, or decreases which will prompt the intervention of the local Public Prosecutor to correct the anomaly verified. With each new diagnosis, new analysis objects can be inserted or improved, so that one of the characteristics of the project is progressivity, as well as continuity.

5. Analysing the apps

Both e-government projects are based on similar legal-political theoretical orientations, as follows.

First, the republican principle, according to which the *res publica* should be managed on behalf of the citizens (on a universal focus, which does not ignore the right to difference), who are responsible for supervising the authority's decisions about the fate of public goods. This principle also imposes the managers' responsibility for noncompliance with their duty of loyalty to the commonwealth, typical of republicanism.

Second, the democratic principle, more precisely as regards to the criteria that guide the deliberative choices about the implementation of social and structural public policies, as well as the direct and indirect participation of society in this process, all which are factors that condition the degree of democratic quality.

Third, integrity in the public sector, which is identifiable by the actual capacity of the public entity to architect its institutional design, detailing the jurisdiction of sectors by area of work, performing its typical tasks in compliance with ethical standards that can be effectively controlled by the various layers of power (institutionalised or not), and establishing instances of accountability for the practice of non-conforming acts.

Corruption, in turn, represents a severe social disease that annihilates the three central ideas of the projects under study: republic, democracy, and integrity.

In a country whose democratic tradition is incipient, the Citizen-Manager works both preventively and repressively concerning public governance. The application fulfils a function of emancipating the citizen since it stimulates his awareness to reflect, question, and dialogue on issues such as the correct use of public resources and their influence in the promotion of public policies able to improve the quality of life of the social body. In this line of thought, the application shows itself as a tool whose priority recipient is the citizen, achieving a purpose of strengthening one's citizenship. However, the prosecutors and servants of the Rio de Janeiro Public Ministry are also recipients since one of the project's vocations is to collaborate in institutional improvement, embracing in the public prosecutor's office itself the notion of integrity.

Hence, with such mechanisms, the citizen can, among other possibilities, monitor and supervise the performance of local managers, comparing it with the performance of other mayors. However, the app offers more: the users may also monitor the performance of the Public Prosecution in their city. In turn, the prosecutors and civil servants of that institution are supplied with better information, concerning the reality of their jurisdiction, with which to enhance both the focus of their activities and the analysis of their own work performance.

As for the second app, there is no doubt that internal control must incorporate multiple functions such as auditing, ombudsman, internal affairs, transparency, and collaboration with external control, among others. Therefore, it requires an appropriate organisational architecture, which will establish the respective enforcement, reparation, and accountability competencies. Such functions, when performed correctly, represent an effective tool to prevent the diversion of public resources as well as their inefficient management. Thus, the project relates to the idea of compliance.

In this sense, Building Internal Control collaborates in the implementation and proper structuring of the internal control systems of the State of Rio de Janeiro and its cities, strengthening responsible public management, instituting a culture of integrity in relations whose objective is the handling of the public estate, and fostering social control.

Besides, the engineered system allows the Rio de Janeiro Public Ministry to verify in which areas the most significant deficiencies and difficulties in the structuring of internal control are located, highlighting the shortcomings for public managers, and contributing to making them more qualified for the tasks included in this control spectrum.

Together, the two platforms use credible and relevant data to enhance accountability, publicity, and transparency in the public sector, acting as mechanisms to prevent corruption because parties and contracts questioned in court are exposed, as well as the damage caused by them. Governments are also exposed, since the comparison shows the deficiency of each municipality, outlining risks to integrity.

It is noteworthy that, although this is not a strict rule, the platforms tend to show an inversely proportional relation in such a way that cities ranked lower at Building Internal Control are those exhibiting larger sums of money claimed in court in Citizen-Manager and vice versa, as follows.

Table 1. Correlation between the internal control ranking and the monetary reparation, as claimed by the prosecution.

Municipalities	Building Internal Control Ranking (1)	Citizen-Manager Ranking (2)	Sum of values claimed in court in *Reais* (R$) (3)	2016 annual budget in *Reais* (R$) (3)	Percentage of annual budget claimed in lawsuits
Rio de Janeiro	1	1	2,724,430,000.00	30,865,931,648.00	8.82
Cambuci	2	48	15,161,000.00	65,950,000.00	22.98
Cantagalo	3	50	14,131,000.00	91,251,500.00	15.48
Queimados	4	52	13,636,000.00	300,000,000.00	4.54
Santo Antonio de Pádua	5	23	47,585,000.00	114,043,400.00	41.72
Piraí	6	90	100,000.00	172,320,000.00	0.05
Nilópolis	7	51	13,778,000.00	370,787,440.90	3.71
Itaperuna	8	64	6,020,000.00	290,423,507.00	2.07
São Sebastião do Alto	9	63	6,784,000.00	40,415,789.20	16.78
Teresópolis	10	35	29,936,000.00	431,319,900.00	6.94
Nova Iguaçu	36	3	517,671,000.00	1,468,683,782.00	35.24
Campos dos Goytacazes	79	2	581,239,000.00	1,690,346,800.00	34.38
Araruama	81	9	148,156,000.00	269,147,617.70	55.04
Cordeiro	90	18	54,950,000.00	59,091,905.40	92.99

(1)   Overall ranking, from the best internal control structuring to the worst.
(2)   Position in the ranking when considering largest sums of money claimed in courts because of corruption or administrative misconduct, from high to low.
(3)   Data extracted from the citizen-manager app.
(4)   Rio de Janeiro State has 92 municipalities.

For example, the city of Piraí occupies the sixth position in Building Internal Control with a grade of 6.68 and is the 90th city of 92 when considering the total amount of money claimed in court. The value corresponds to 0.05% of the 2016 annual budget. Contrarily, Campos dos Goytacazes is ranked in the 79th place in the Building Internal Control app, receiving a grade of 2.75, and exhibits

the second-highest absolute value attributed to corruption and deviations, corresponding to 34.38% of the 2016 annual budget.

As for the small city of Cordeiro, 90th of 92 in Building Internal Control ranking, although it occupies the 18th place when considering the calculation of total sum from the lawsuits, this is equivalent to 92.99% of the 2016 annual budget.

These examples display a tendency: better internal control results in less corruption and less misuse of public resources, decreasing accusations; worse internal control results in more corruption and more damage to the exchequer, increasing claims.

However, the most significant exception to the propensity indicated above is Rio de Janeiro city, the capital of the state, because it is first in both rankings. The position may be explained due to the city's disproportional budget (R$30,865,931,648.00), which corresponds to almost 40% of the State of Rio de Janeiro budget, which was R$79,900,583,758.00 in the year 2016. Hence, although it shows the highest sums of money attributed to corruption and diversion of public resources, the value corresponds to 8.82% of the city's 2016 annual budget, which is proportionally lower than other cities.

Punctual discrepancies may also unfold the higher or lower degree of efficiency of the local prosecution, civil inquiries, and police investigations.

Nonetheless, ultimately, the apps cause a disruption. By building, using, and making them available to the public, the Prosecutor's Office of Rio de Janeiro State employs new technologies to increase control. This is done in such a way that, when compared to traditional methods, the systems can generate more information, more qualified data, and allow users to perform comparisons applying a variety of criteria and levels. The whole process throws light on topics that were obscure and not adequately systematised by the *modus operandi* previously in force. The consequence of the use of this kind of digital platform for such a purpose is that it increases the degree of transparency and access to information, both essential elements for democratic consolidation.

6. Using apps as corruption prevention mechanisms – improving publicity, transparency and access to information – result: improved accountability and corruption prevention

It is certain that an online platform developed to combat the dilapidation of the public property will reach a significantly larger number of citizens than those that require the presence of the individual, restricted to the local scope. Therefore, it will improve comprehensiveness and publicity.

The fact that the applications studied provide a wide range of information, displayed for the user in a facilitated way, positively contributes to a more transparent public management of the common good. As a consequence, transparency is amplified.

The publicity and transparency improvement result in enhanced accountability, revealing the identified damage to the public exchequer as the work of control institutions.

However, the vast availability of data also promotes citizenship. By searching and easily finding information about his local government and prosecution, the user becomes empowered, able to question his political representatives and state officials. Also, due to the offering of online communication channels to report misconducts, whistleblowing is facilitated.

Therefore, the apps aim to foster democratic participation. Nevertheless, the question that remains is what will come from their use. Can the platforms involve all stakeholders?

It seems clear that those working with public data, like researchers, prosecutors, or the government's agents themselves, will benefit from the use of the apps under analysis. After all, they will have access to a reliable, unbiased, comprehensive, concentrated, and user-friendly database, which makes it easier to find the knowledge they seek and simultaneously facilitates comparisons. Supplying anti-corruption institutions with that kind of information allows them to exercise their duties more efficiently.

But what about the citizen? Without civic engagement, no computer program will change reality. The challenge, then, is to attract the user's interest and motivate him to take part in the affairs of his political community, reporting illegalities or demanding action.

We do believe that citizens will be motivated when they realise that the law enforcement agencies do listen to their complaints and take action for it, which will also foster trust in the institutions.

By empowering the citizen and transforming each user into an inspector, along with the development of trust in the Prosecutor's Office, the apps are expected to work as efficient corruption prevention mechanisms, disseminating and decentralising control.

Lastly, it is expected that the exposure will generate embarrassment in such a way that politicians will not want to have their images linked to poor governance or corruption. Therefore, they will work to enhance internal control and minimise the bad publicity that comes from the disclosure of the mismanagement of public money. That behaviour will, as a consequence, contribute to preventing corruption from happening.

Other apps may be idealised, developed and integrated with the existing ones to create an anti-corruption e-network.

7. Conclusion

As previously stated, in Brazil, the Prosecutor's Office is constitutionally an anti-corruption institution. By using the Internet as described, it updates traditional methods and fosters public trust since it reveals to people the effectiveness of enforcement mechanisms using relevant statistical data, exactly as recommended by the OECD Council on Public Integrity (OECD Council on Public Integrity 2017).

The ideals of good governance will only be fully attained when public bodies provide citizens with digital means in which they can access information and register their accusations, complaints, suggestions, and satisfaction or dissatisfaction with the way things are handled.

Public agencies should use the data obtained by citizen participation through digital mechanisms to prioritise their actions and digitally return to them the results achieved.

By publishing results in an objective and transparent manner, the population's longings will be met. The higher the degree of return in the investigation of complaints and charges that arrive digitally, the greater the confidence, participation, and satisfaction of society.

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