



STREAMLINED TAX ADMINISTRATION IN RIO DE JANEIRO: IMPLEMENTING NOTA CARIOCA, 2009–2014

SYNOPSIS

A complex paper-based city tax collection system made Rio de Janeiro a difficult environment for business and a source of lost revenue when Eduardo Paes became mayor in 2009. Elected on a promise to set the city's fiscal house in order, Paes planned to implement an electronic invoicing system based on similar programs piloted in other Brazilian cities. A recent constitutional amendment required all levels of Brazil's federal system of government to ease the burdens of the country's tax system. Paes reasoned that the potential efficiency gain from a new system was among the few routes available for increasing revenue. His team had to overcome significant challenges to implement the new system and ensure participation by consumers in monitoring tax payments. Strong political and technical leadership, collaboration, and good design helped to successfully implement the new system, called Nota Carioca. This case study offers other governments at the national or subnational levels useful lessons in improving revenue administration and implementing reforms that feature information technology, stakeholder communication, and partnerships.

Neil Fowler drafted this case study based on interviews conducted in Rio de Janeiro, Brazil, in March 2014. The case was prepared by ISS in partnership with the World Bank as part of the Bank's Science of Delivery initiative. Case published July 2014.

INTRODUCTION

Marcio Luiz Oliveira's tenure as Rio de Janeiro's service tax coordinator began in 2007 with an eye-opening experience. He later recalled his surprise when he arrived for the first time at the city's tax registry, the *cadastre*, and found piles of unprocessed envelopes with information so out of date that he had to mobilize a team of 20 staff and 40 interns to call companies and request updates.

A year afterward, in 2008, mayoral candidate Eduardo Paes made a campaign promise to reform service tax administration in Rio de Janeiro

as part of an ambitious change agenda. The reform, called Nota Carioca, was designed to address fiscal challenges and increase the efficiency of the city administration.¹ It also responded to a national-level push to improve and streamline revenue policy and administration.

Rio de Janeiro's revenue administration challenges mirrored those of Brazil as a whole. In 2008 alone, to comply with their tax obligations, businesses in Brazil spent an average of 2,600 hours per year—more than any other country in the world.² The huge administrative burden, along with high tax rates, created a challenging business

environment. Marcio Beck, economics correspondent at the *O Globo* newspaper, commiserated with private firms. “Many businessmen, especially the small and medium-sized businessmen, view tax evasion not as a detour. It’s a matter of survival sometimes,” he said. “They believe that they can’t pay all their taxes and have a viable business.”

Furthermore, Brazilians were skeptical of their government’s ability to spend tax money effectively. “For the general population, the destination of our taxes here in Brazil is basically a black box,” Beck said. The lack of public faith in the government’s revenue and expenditure capabilities had troublesome implications for the broader social contract: the willingness of citizens to trade their liberty for the benefits of governance.

Earlier, in 2003, the federal government had passed Constitutional Amendment 42, which challenged subnational tax authorities to improve tax administration coordination and efficiency. But five years later, as Paes campaigned, Rio de Janeiro had seen only limited improvements.

THE CHALLENGE

Paes won election in 2008, took office as mayor in January 2009, and immediately began to grapple with Rio de Janeiro’s stern economic and fiscal challenges. From 1985 to 2003, the city’s economy had shrunk by an average of 1.1% per year.³ Although the city had experienced moderate growth from 2003 to 2008, it had long suffered from high levels of poverty, and its vast slums had scant infrastructure and poor security. Economic growth was a priority, and to achieve it, the municipal government had to invest more than the 3.5% of GDP invested in 2009. However, the administration was held back by debt of 8.5 billion reals (US\$4.9 billion at the time) and by interest payments that absorbed 9% of annual revenues.

With the total tax burden already high, the city’s options for raising revenue were restricted. The city relied on both a sales tax on services and a property tax to raise revenue; the federal government taxed income; and the state taxed

sales of products. Rio’s only realistic option was to improve tax collection and broaden the revenue base.

The city administered the sales tax on services by using a paper-based system that placed a heavy burden on staff of the municipal Finance Secretariat. In addition, as described by Oliveira, the system wasted businesses’ time. Marcia Tavares, president of Rio’s accountancy firms union during the implementation period, said inefficiency imposed many different types of costs, including hours spent navigating heavy downtown traffic to reach city hall to get required signatures and stamps.

However, implementing any changes to administration of tax collection would be tough. A new approach would inevitably involve information technology (IT), and public sector IT implementation projects were notorious the world over for failing to deliver promised results. The challenge was even greater in Brazil, where the public was openly skeptical about the government’s ability to do its job.

Oliveira recognized that any new system would have to overcome skepticism related to new technology. “The greatest challenge was finding a product good enough to replace the previous system, which was bureaucratic but trustworthy. We didn’t want to have a system that would be fast but insecure or unreliable,” he said. The new system would also have to serve the wide variety of businesses operating in a major city. That meant the system would have to be workable for small, one-person companies as well as the local offices of national and multinational firms with established internal accounting practices and systems.

Although the technical-design aspect of a new approach to service-tax collection was crucial, it represented only half the implementation challenge. The other half was explaining how the system functioned to thousands of businesses across Brazil’s second-largest city.

The pressure on Paes was even more acute because Brazil’s largest city, São Paulo, had implemented an electronic invoicing system two years earlier, in 2007. Tavares said, “Rio had

wanted to have something similar [to São Paulo’s] for years.” Rio de Janeiro had fallen behind and needed to catch up.

FRAMING A RESPONSE

Recognizing the breadth and complexity of the challenge he faced when he took office, Paes initially moved to gather together the kinds of people he needed to succeed. Drawing on the experiences of other Brazilian cities and a national model, Paes and his team prepared the groundwork for implementation of a radical improvement in service sales tax administration.

Building a reform team

To deliver on his campaign promises, Paes assembled a talented reform team to help him tackle Rio’s debt problem and oversee delivery of the development and rollout of electronic invoicing.

Setting a higher value on career competence than political background, Paes recruited Eduarda La Rocque to be finance secretary, the person who would provide the high-level leadership for the project. Although she had had no experience in government, La Rocque held a doctorate in economics, had spent 11 years as an investment banker, and at one time had also owned an IT company. In addition to presiding over the development of the new Nota Carioca electronic

invoicing system, La Rocque was also responsible for restructuring the city’s debt into a single World Bank loan of US\$1.045 billion (1.88 billion reais at the time). This was the largest such loan the World Bank had ever made to a municipality,⁴ and it would end up saving the city about 25% of the value of its debt at that time.

La Rocque needed someone to take charge of the details of implementation, and she placed her faith in Oliveira, who delayed retirement from his job as service-tax coordinator to become subsecretary of taxation. La Rocque was impressed by Oliveira’s deep knowledge of revenue administration and the electronic invoicing solution. “Marcio had everything ready,” she said.

Oliveira came from a self-declared humble background. After leaving school, he worked in the construction industry, sacrificing a university education in order to contribute to his family financially. He served in the armed forces for 16 years, eventually completing an engineering degree, and then took a competitive public examination to join the Finance Secretariat. Oliveira was passionate about improving the tax system. He said he quit his positions in the Finance Secretariat four separate times out of frustration over not being able to get things done, but he always stayed on in another capacity.

As subsecretary of taxation, Oliveira led the day-to-day operations of the electronic invoicing

Textbox 1: Behavior, Incentives, and Program Design

Designing a tax system required an understanding of the two main reasons for tax compliance. First, taxpayers might take a rational approach by weighing the pros and cons of payment. If they believed they’d receive benefits from paying, such as education or good roads, then they were more likely to pay. If they believed there was a credible threat of being inspected by the tax authorities, they were also more likely to pay. In Brazil, there was widespread skepticism about service delivery by the government, with one commentator describing the state as an “anemic leviathan.”¹³ The huge backlog of unresolved and outdated tax cases noted by Oliveira suggested that there were also no credible threats of inspection and audit in Rio de Janeiro.

Second, taxpayers might pay tax obligations because of a desire to be accepted by wider society. If taxpayers felt they would be judged positively for paying taxes (or would avoid being judged negatively), they were more likely to pay. The positive judgment needn’t involve explicit feedback from community members; it might simply have to do with the positive emotions that resulted from payment—or feelings of guilt for tax evasion. *O Globo* journalist Beck suggested that social pressure to pay taxes was weak both in Rio and in the country as a whole in the early 2000s.¹⁴ Most customers in Brazil did not even ask for receipts when they bought services, so there was little pressure on vendors to record transactions accurately.

implementation team. He also filled a major role as intermediary between the city administration and politicians. He recognized that a tax change of this magnitude required strong and effective communication. “If you don’t have both sides speaking the same language, you cannot implement anything,” he declared. “The whole process represents a change in the culture of taxation. My job was to convince everybody that the new system was good and reliable.”

Oliveira recognized that La Rocque had placed a great deal of faith in him. “For the first time, a subsecretary had access to the mayor,” he said. As Rio’s service-tax coordinator, Oliveira had already engaged with counterparts in other state capitals on the issue of electronic invoicing, so he had in effect been preparing for this moment for years.

The electronic-invoicing innovation

Rio de Janeiro did not need to look far for a technical solution. By the time Paes was elected, electronic invoicing had existed in Brazil for six years and was the logical solution to Rio’s service-tax administration challenges.

Angra dos Reis, a small city two hours’ drive from Rio, pioneered a system of electronic invoicing in Brazil in 2002. Pedro Arroyo, a consultant for Rio’s Finance Secretariat, had implemented the system when he worked for an IT company called TIPLAN. In 2007, São Paulo had adopted a similar system as the basis for an ambitious implementation. Although the systems were not identical, they followed the same basic approach to overcoming challenges to tax enforcement.

Arroyo explained that electronic invoicing “was not an evolution; it was an innovation.” Instead of writing paper receipts, electronic invoicing required vendors to enter service invoices into an online system operated by the government. Customers could log in to the system to check whether their receipts and their service-tax payments had been filed and that the numbers were accurate.

The main challenge was to ensure that customers actually did take time to use the system,

because such use was the primary check that vendors were doing what they were supposed to do: charge the required tax and report it in the system. To encourage customers to do so, the system in Angra dos Reis rewarded customers for collecting electronic receipts by giving them a discount on their property taxes. Although other cities that implemented electronic invoicing modified the approach to fit their own needs, incentivizing consumers to act as a control on vendors remained a central principle.

An additional and important incentive in the electronic invoicing model was adopted in São Paulo and other cities: by collecting receipts, customers were also entered into a lottery to win a cash prize. Prizes from lotteries served as a type of incentive different from rewards linked directly to expenditure, and their power rested on a concept called *availability bias*.⁵ There would be a great deal of fanfare about the relatively few lottery winners, whereas the many people who did not win would receive less attention. Thus there would be more information *available* about winners. A lottery system would therefore lead customers to overestimate their chances of winning and would be an additional incentive for them to collect electronic receipts. And excitement about lottery winners would help publicize electronic invoicing more generally.

Creating a national model

Oliveira had worked on developing electronic invoicing since 2007, along with Adriano Cereja, IT manager at the Finance Secretariat. The two represented Rio de Janeiro’s Finance Secretariat in the national Association of Finance Secretaries of Capitals (Associação Brasileira das Secretarias de Finanças das Capitais, or ABRASF), which brought together representatives from across the country to create a standard national model for electronic invoicing. Cereja explained: “Each [member city] represented sent two people: one person who was a specialist in business, like Marcio Luiz, and one person who was a specialist in IT.”

Eugenio Eustaquio Veloso Fernandes, who represented the city of Belo Horizonte at

ABRASF, said a standard national model would reduce costs for the many businesses that operated across jurisdictions and make it easier for different tax authorities to exchange information, thereby paving the way for improved enforcement.

The ABRASF group had the advantage of being able to study the successes and shortcomings of São Paulo's implementation. The members used São Paulo both as a starting point for the national model and "to choose the best things about the system and use it to construct the national model," Cereja said.

Antonio Arantes da Cruz, system manager of Rio's Nota Carioca system, said the ABRASF standards were extremely useful in his system. Universal file formats (.txt and .xml files) facilitated easy communication of data, which meant the system could tackle "the two extremes of the bell curve." Large companies with high volumes of transactions could easily integrate their systems with Nota Carioca so that data flowed to it automatically. Small businesses that lacked Internet connections could upload their files to the system on an occasional basis, issuing temporary paper receipts in the meantime.

By the end of 2008, the group had established the national model, including the concept, the layout of data, manuals for system integration, and the information required for building a data archive. The collaboration laid the foundation, but for Rio de Janeiro the hard work lay ahead. Oliveira and his team had to build their own system that would accommodate the city's particular tax regulations and processes and fit well with its IT infrastructure and other systems.

GETTING DOWN TO WORK

The national model was completed before the end of 2008, but the national electronic-invoicing initiative ran afoul of a municipal government transition. "The main issue was that it was the end of the previous administration, so there was not so much interest in implementing the electronic invoicing system, because only the next mayor would take advantage of the results," said Oliveira.

The Finance Secretariat under La Rocque, with Oliveira as subsecretary of taxation, focused on Nota Carioca from the start. Oliveira led an implementation process in which his team purchased new software, secured data-storage capacity, customized the software to Rio's needs, and, finally, switched on the system. After implementation, the team continued to use Nota Carioca as the basis for ongoing reform.

Selecting and buying the software

As a municipal government agency, the Finance Secretariat had to follow government procurement procedures, but it sought to bolster them by investigating options carefully in advance. The office researched potential software providers online, consulted contacts in other tax jurisdictions, and invited 15 companies to a presentation on the national model and Rio de Janeiro's particular needs. Oliveira and Cereja invited shortlisted companies to present their software solutions and interviewed each by using a standard set of questions. The business-process members and IT members of the team then jointly evaluated the software providers.

When the Finance Secretariat opened formal bidding, two companies offered proposals. One of them was TIPLAN, which had designed the software for the first system in Angra dos Reis and in São Paulo.

As the process moved forward, the implementers began to worry. A number of those involved in Nota Carioca grew concerned that cumbersome public procurement processes would pose key hurdles, a challenge often faced by government agencies around the world. They appreciated the importance of a transparent and competitive process to ensure impartiality and low cost, but they had concerns about the ability of the process to deliver the best solution for Rio's specific needs. In addition, the city's procurement process in the past had sometimes become bogged down in litigation, which risked delaying implementation and provoking more public skepticism about the city's ability to get things done.

Given the uncertainty about the normal procurement process, the team turned to an alternative approach offered through the private sector. Antenor Leal, president of Rio's Commercial Association (an organization of businesses that operated in the city), was a strong supporter of the service-tax reform effort. Leal said Nota Carioca was an opportunity to contribute to his mission of "working with the government to reduce government" by helping streamline the bureaucracy and ease the burdens that government too often placed on businesses. In addition, he viewed Nota Carioca as another way to further the Commercial Association's aim of formalizing Rio's business community, which was heavily populated by small, low-key enterprises that operated outside legal and regulatory frameworks.

That private sector support was important to Nota Carioca's implementation because it circumvented the cumbersome government procurement process and ensured the choice of the favored supplier for the best solution. The Commercial Association borrowed funds from Santander Bank to purchase electronic-invoicing software from TIPLAN and then donated the software to the government. However, to ensure that TIPLAN's work would fit the city's needs, the Financial Secretariat remained deeply involved in defining that work. La Rocque was able to bring her private sector experience to bear. "I had my own IT company," she said. "I could say that my experience as an IT provider helped us in defining the contract with the company."

Securing data storage and processing capacity

During the software procurement process, the Nota Carioca team came across another challenge. The team had originally hoped that the software provider would also be able to provide a packaged solution that included data storage, but team members soon became aware that software providers could not offer that kind of hardware capacity.

Nota Carioca needed to "offer society a service seven days a week, 24 hours a day," which made data processing and storage capacity crucial

elements of the system, said Cereja. The system required powerful and secure servers to handle the processing and storage of sensitive data and a vault room to ensure that data would be safe from fire, water, and theft. The importance went beyond technical concerns to government credibility. Cereja recognized that "people would evaluate our services based on the availability of the system."

The team decided that the best available option was to increase the capacity of the municipal government's own IT service provider, called IPLANRIO, at a cost of 14 million reals (US\$8 million). IPLANRIO managed the IT needs of many municipal processes, including property tax, budgeting, and internal accounting. Working with IPLANRIO had the advantage of ensuring that confidential data would be stored in city hall, which had legal responsibility for the information. Fernando Braga, technical director of TIPLAN, said that splitting responsibility for software design and data storage had an additional security benefit: TIPLAN would develop the system but would have no access to data, and IPLANRIO would have access to data but incomplete knowledge of the development of the system. The split made it more difficult for any one individual in either organization to tamper with sensitive data.

Customizing the software

In early 2010, the team began customizing the electronic-invoicing software to fit Rio's needs. Alexandre Calvert, a Finance Secretariat tax inspector deeply involved in the process, said customization was important because ABRASF's national model had established some "general norms, but each city has its own particular norms, and customization changes from city to city."

The following describes several ways in which Nota Carioca differed from other systems such as São Paulo's:

- *Size of rewards:* São Paulo offered 30% of the service tax as a credit towards property taxes for individual customers, whereas Rio de Janeiro offered only 10%.^{6,7} La Rocque reported that Rio's lower incentive enabled

the city to avoid the fiscal difficulties that had befallen São Paulo, but Braga of TIPLAN said that Rio's fiscal conservatism represented a lower incentive for customers to collect receipts.

- *Payments into bank accounts:* Both Rio de Janeiro and São Paulo offered customers payments directly into their accounts, which was an evolution of the original model, in which customers had to take their rewards in the form of discounts on their property taxes. Payments into bank accounts let rewards be distributed to a wider population, not just property owners.
- *The lottery:* Both Rio de Janeiro and São Paulo offered lotteries as additional incentives for customers, but with an important difference: São Paulo offered customers one lottery entry for every 50 reais (US\$21) spent on collected electronic invoices.⁸ Oliveira decided that Nota Carioca would offer a lottery entry for every purchase made—regardless of value.⁹ The Rio decision was important because it incentivized the collection of electronic invoices from small purchases that otherwise might avoid issuing invoices and paying taxes. The aim was to bring public pressure to bear on such businesses and broaden the city's tax base.
- *Incentives for vendors:* Rio de Janeiro did not offer rewards to service vendors that complied with electronic-invoicing requirements. São Paulo, on the other hand, offered a 10% rebate to all companies enrolled in a national-level program for small companies.
- *Combined product-tax and service-tax incentives:* São Paulo and other cities in the state made a deal for a combination system that would handle both the city tax on services and the state tax on products. The system greatly broadened the spectrum of purchases for which consumers could receive rewards, which increased incentives and raised levels of awareness. The administrations of Rio de Janeiro city and Rio de Janeiro state were unable to reach a similar agreement.

Rio's development team comprised (1) members of the Finance Secretariat, who had overall responsibility for the reform and brought knowledge of tax policy and process; (2) representatives of IPLANRIO, who would oversee data processing and storage and the incorporation of Nota Carioca into the existing IT infrastructure; and (3) people from TIPLAN, who would provide software and tailor it to the city's needs.

Although such a diverse working group might be expected to struggle with dissension and disagreement, members said the group functioned smoothly for three main reasons. First, all three groups worked in the same room every day. When the members of the Finance Secretariat team or the IPLANRIO team identified a change that was required in the software, the need could be communicated and explained to the IT specialists immediately. In turn, changes the group made could be tested right away.

Second, members of the Finance Secretariat had specific responsibilities that took advantage of their particular backgrounds and talents. Calvert said the tax inspectors were each "responsible for one issue within the ratification of the system. So, one would be responsible for who was consulting the system, one other would be responsible for registration in the system, another one for the information flow . . . each one would have one responsibility." He explained that the clear division of responsibility empowered each employee. It was efficient and it drove the system forward.

Third, TIPLAN took an iterative and flexible approach to software development. Technical director Braga said his company worked according to the Manifesto for Agile Software Development.¹⁰ The approach prioritized individuals and interactions, working software, customer collaboration, and responding to change. Braga credited this flexible and solution-centered approach for TIPLAN's success. Both the Finance Secretariat staff and the IPLANRIO staff praised TIPLAN's software engineers for anticipating and implementing changes to the system.

Switching the system on

In May 2010, the team opened Nota Carioca for companies to register voluntarily. Then began a period of mandatory registration starting with the largest companies as defined by 2009 revenues. On August 1, the Finance Secretariat made registration compulsory for all companies with revenues equal to or greater than 240,000 reais (US\$136,000). On November 1, companies with lower revenues and no tax exemptions were required to register. On December 1, all remaining companies had to register.

The phased approach enabled the team to fine-tune the software design in the early stages. The software engineers tackled issues as they arose, again working closely with team members from the Finance Secretariat and IPLANRIO, as they had during the system’s development. Those involved in the implementation of Nota Carioca reported no major problems, citing the design process that benefited from ABRASF’s national model, lessons learned from previous implementations of TIPLAN’s software, and Rio’s effectiveness in customizing the process.

The rollout involved an extensive communication program. Oliveira recalled roughly a hundred meetings with different business groups, at which he and his colleagues

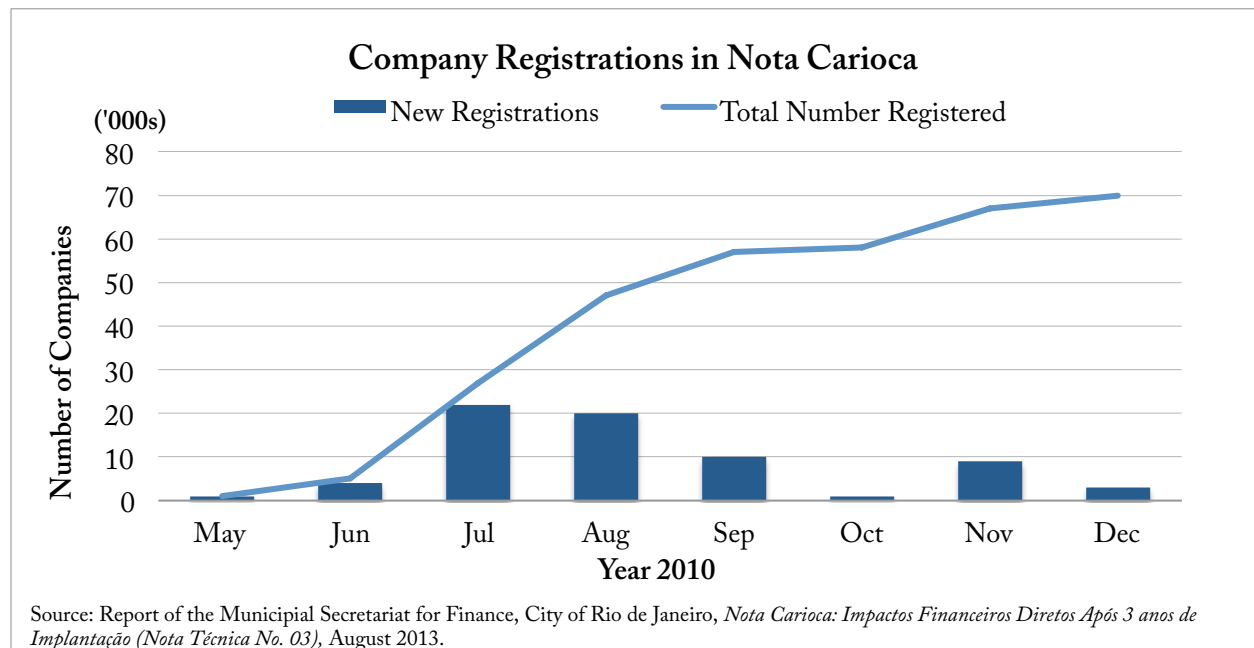
explained how to access the system and how to issue invoices.

To support the Finance Secretariat in communicating the change to businesses, Oliveira found an important ally in Tavares, who was first vice president and then president of the Rio de Janeiro Accountants Union at the time of implementation. Tavares was enthusiastic for change but also recognized that some small businesses that issued a lot of invoices, like beauty parlors and car parks, might oppose Nota Carioca or face difficulties in implementation.

Tavares expressed those doubts to Oliveira, who responded by asking the Accountants Union to help spread the word among her members’ employers. As Calvert of the Finance Secretariat said, “If you reach one accountant, you reach many companies.”

Because accountants worked with businesses across the city on a daily basis, they were in an ideal position to explain the benefits and workings of the new system. Tavares also accompanied Oliveira and Finance Secretariat staff to many of their meetings with businesses. Those meetings were well attended: Tavares recalled that she addressed 700 attendees at a single meeting in August 2010.

Not all companies were easy to bring on



board, especially smaller businesses that dealt mainly with individual consumers, such as those that managed for-pay parking lots, Calvert said. Business-to-business companies, he said, tended to be larger and more sophisticated and immediately saw the benefits of an electronic system.

It was also important for the government to inform private citizens about the new system. Although many companies performed work for other businesses, many other companies delivered services directly to individual consumers. Citizens needed to know how to get into the new system, how to request invoices when buying services, and what rewards they would receive for doing so. Citizen education was based on “a media plan: through TV, billboards, newspapers,” Calvert said.

The present day: Continuous improvement

Following the initial implementation, the Finance Secretariat continued to use Nota Carioca as a foundation for further improvements to revenue administration. As Calvert explained it: “We realized that Nota Carioca is not just an issuing system; it’s a system of tax administration. We’re trying to add value to the system by inserting more services . . . it has been our mind-set to reduce paperwork to zero.”

The tax service self-assessment book was included in the Nota Carioca system, as were the civil construction material registry and information concerning incorporation in the state of Rio de Janeiro.

Additions and changes to Nota Carioca were communicated through messages within the system itself, making it easier to raise awareness among users. Plans for future improvements included adding the tax inspectors’ fiscal logbook and the financial institutions tax assessment logbook.

OVERCOMING OBSTACLES

Domestic tax havens and difficult state-city coordination raised hurdles for the Nota Carioca reform team.

Fiscal paradises

Brazil’s decentralized approach to revenue policy and administration led to the emergence of domestic tax havens. Cruz, Nota Carioca’s system manager, described the havens as “fiscal paradises”—small cities located outside Rio de Janeiro that attracted businesses by offering very low tax rates. Companies that registered in those havens often avoided paying service taxes to Rio by claiming that sales made in Rio actually took place in the lower-tax jurisdiction. Oliveira described the situation as a “tax war.” Fiscal paradises threatened Rio’s municipal revenues by depriving the city of legitimate tax payments. However, the Finance Secretariat was able to use Nota Carioca as a powerful tool in overcoming the challenge.

In 2007, Rio de Janeiro had implemented a system called CEPOM, which required companies based outside Rio but active within it to register in the city. Once it had implemented electronic invoicing, the Finance Secretariat was able to cross-reference the information in CEPOM with the information gathered in Nota Carioca. When companies were based outside Rio de Janeiro but refused to register in CEPOM, Rio’s municipal government required those companies’ customers to withhold the service tax.

No matter where they were based, companies were now unable to escape their tax obligations in Rio. Cruz said that taxes collected from companies in this category tripled as a result. Many companies abandoned the tax dodge and relocated back to Rio de Janeiro.

State-city coordination and public awareness

Rio’s Finance Secretariat had less success resolving misunderstandings over taxes paid on services versus taxes on product sales. The city collected service taxes, for which customers could claim credits. The state collected sales tax on products for which there was no credit. But the definition of a service was not always clear. For example, one might expect to receive credit for purchase of a restaurant meal, typically considered a service, but in Brazil, for tax purposes a restaurant meal was defined as a product.

Confusion over what counted as a service made it difficult to communicate to consumers—especially individual citizens—when they should expect Nota Carioca credits and when they should not, because the credits were available only for some purchases.

Additionally, the city's service tax rate was set at around 5%, whereas the state's sales tax on products was much higher. Rewards based on service taxes were therefore much lower than they would be on sales taxes. Lower rewards reduced the incentive for consumers to request invoices when they purchased services. Rio's government could have chosen to raise rewards to a much higher level, but only at the risk of eroding revenues from the tax.

São Paulo did not face this problem, because the city and state administrations had joined forces to implement an integrated invoicing systems for both sales and service taxes. By mid 2014, Rio de Janeiro had not been able to achieve the same level of coordination.

ASSESSING RESULTS

Rio de Janeiro moved to an electronic service tax collection system within two years of Paes's becoming mayor. The Finance Secretariat transferred the city's entire service tax management into the Nota Carioca system in 2010.

By mid 2014, the Nota Carioca system had 143,637 registered vendors and 499,235 registered customers. From the rollout in 2010 to April 2014, the system issued more than 400 million electronic invoices. Following the implementation of Nota Carioca's core features, the system became a model for digitization of additional tax processes and other financial services.

Rio de Janeiro was able to capitalize on São Paulo's experience and learn from the latter's mistakes. For example, Rio's lower rewards enabled it to avoid fiscal difficulties that La Rocque said had beset São Paulo because of its generous reward payments.

A number of Finance Secretariat staff noted that some small businesses, such as beauty parlors and parking lots, were reluctant to use Nota

Carioca. Finance Secretary La Rocque said the challenge stemmed from the fact that those small businesses were informal by nature. Those sectors may have represented only a small portion of service business activity in Rio, but they revealed the limits of Nota Carioca's effectiveness in expanding the tax base. Nota Carioca changed the behavior of a vast portion of the service sector, but some businesses continued to resist the new incentive structure.

Both government and the private sector praised the system. Within the Finance Secretariat, there was some initial opposition from the lower ranks of employees. "But it was in the beginning; nowadays they like the system very much; they use it because it makes their job much easier," said Cruz. "It reduced paperwork; it reduced stress," said Tavares, president of the accountancy firm union. Rio's Commercial Association president Leal was enthusiastic about the initiative's achievements in reducing the size of government and helping formalize the business community.

Tavares spoke very positively of Nota Carioca's impact on business efficiency, but data showing time saved was not available. Across Brazil, the amount of time it took for firms to prepare and pay taxes did not change from 2008 to 2014, remaining at an average of 2,600 hours annually.¹¹ Although one system in one city could not be expected to affect that figure, it does suggest that further improvements are needed across the country.

Nota Carioca alone could not solve Rio de Janeiro's fiscal challenges, but it made an important contribution. Analysis by the Finance Secretariat in August 2013 showed that the gains from Nota Carioca were 686 million reais (US\$393 million) from July 2010 to June 2013. The report judged this to be "a permanent change in the level of revenue."¹² However, it is difficult to disaggregate increases in revenue that stem from the implementation of Nota Carioca from increases that stem from economic growth.

There were also significant costs that served to offset some of the efficiency and revenue gains. Although the Commercial Association paid for

the software, the municipal government had to pay for operating costs and ongoing development. In addition, the data storage requirements were significant and continue to grow, with 10 million reals (US\$5 million) investment in IPLANRIO budgeted in 2014.

REFLECTIONS

Fast implementation, few problems, and positive feedback from the private sector indicated that Nota Carioca's implementation was a success. The several significant aspects of Rio de Janeiro's reform—described next—help explain why the city managed to avoid many of the difficulties administrations face when they attempt reforms of this kind.

- *Leadership commitment* by Mayor Eduardo Paes and Finance Secretary Eduarda La Rocque was essential in getting started on the Nota Carioca project and on its continuing despite such challenges as IT infrastructure investment and software procurement. Their commitment gave Marcio Luiz Oliveira, subsecretary of taxation, the political clout and personal credibility to focus his team, his partners, and his allies on the task at hand. Oliveira's own commitment and leadership were important in keeping Nota Carioca on track.
- *Effective collaboration* played a major role in Nota Carioca's success and reached beyond contractual agreements and token support: The finance secretariats of cities across Brazil worked together through ABRASF to develop a national model. The Commercial

Association of Rio de Janeiro provided vital financial support to procure the software. The Accountants Union lent its support to the system's rollout. And the tripartite team developing the software worked seamlessly together. Those involved spoke of a genuine shared sense of purpose.

- *Second-mover advantage* enabled Rio de Janeiro and other cities to build their successes on the lessons learned by Angra dos Reis and São Paulo. That those systems were viewed as successful also created an appetite for reform throughout the business community.
- *Focus on system design* meant that the Finance Secretariat was able to roll out a robust system that met Rio de Janeiro's specific policy and process requirements. And it was one that used standards designed to facilitate integration with other systems in the future.
- *Building on its success* in implementing Nota Carioca, the Finance Secretariat began using the system as a foundation for further improvements to revenue administration, with the long-term aim of creating a paperless tax system.

Paes's administration set out to raise revenue and increase efficiency rather than tackle the broader and more challenging issues of public confidence in government and the social contract between state and society. However, Nota Carioca offered a level of engagement between the city government and citizens that may, in the long run, increase trust and understanding.

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