THE DIALOGUE
Leadership for the Americas

Atlantic Council
ADRIENNE ARSHT
LATIN AMERICA CENTER

HACKING CORRUPTION

Tech Tools to Fight Graft in the Americas

María Fernanda Pérez Argüello
Tamar Ziff

MAY 2019

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INTRODUCTION

"There's enough money when no one steals." That message led a minor-party candidate, Nayib Bukele, to a landslide victory in El Salvador's 2019 presidential election, handily beating the combined vote totals of both major parties' candidates. Bukele's election was the latest in a wave of political victories in Latin America by anti-establishment candidates running on anti-corruption platforms.

These political platforms are successful because corruption is endemic in the region, as revealed both by earth-shaking corruption scandals such as Lava Jato in Brazil, and routine surveys that show, for instance, that one of every two Mexican citizens has bribed a public official.[1] According to the Organization for Economic Cooperation and Development (OECD), bribery in government procurement increases contract costs by 10-20 percent, resulting in $400 billion in bribery losses every year.[2] Lava Jato alone involved contract surcharges of above $6 billion in the region.[3] In Peru, the World Bank puts the cost of corruption at $10 billion per year, approximately 3 to 5 percent of the country's total GDP. In Mexico, corruption has been estimated to cost up to 10 percent of GDP.[4]

These and other scandals have degraded Latin Americans' trust in their governments. According to a 2017 Pew survey, only 2 percent of Brazilians and Mexicans trust their government "a lot." The situation isn't much better elsewhere in the region: 73 percent of Latin Americans are dissatisfied with their government.[5]

The Latin American revolt against corruption—manifested both in street protests and at the ballot box—is not necessarily the result of increased corruption, but rather growing awareness and intolerance of corruption. Advances in technology and greater civic participation have empowered media, citizens, and watchdog non-governmental organizations (NGOs) to discover and expose corruption. Although citizens today may feel like they see more corruption, they also feel more emboldened to fight it; a recent Transparency International poll shows that 70 percent of Latin Americans believe ordinary people play a key role in the fight against corruption.[6]

Against this backdrop of scandals and citizen discontent, the Peruvian government designated "democratic governance against corruption" as the central theme of the 2018 Summit of the Americas—the triennial meeting of heads of state from countries in the Americas. In preparation for the meeting, the Adrienne Arsht Latin America Center at the Atlantic Council and the Inter-American Dialogue partnered with the Peruvian Foreign Ministry to develop inputs for the meeting's declaration and plan of action. The organizations convened anti-corruption experts from around the hemisphere in Washington, DC and in Lima, Peru for discussion sessions. Results were presented at pre-Summit planning meetings hosted by the Organization of American States, with the participation of regional government representatives. These ideas helped to inform the resulting Lima Commitment,[7] which included 57 concrete actions to enhance and strengthen transparency and the fight against corruption in the region.

To advance implementation of the Lima Commitment,[8] the Adrienne Arsht Latin America Center and the Inter-American Dialogue, with the support of Open Society Foundations, convened anticorruption experts from the technology, government, multilateral, media, business, and civil society sectors in early 2019, with the goal of identifying and promoting cutting-edge tech solutions in the transparency and anticorruption arenas, specifically those related to public procurement given its centrality to recent corruption scandals. This goal was informed specifically by Commitment 17 of the Lima Declaration:

17. Promoting the use of new technologies that facilitate digital government in order to promote transparency, interaction with citizens and accountability, through development of tools for the identification, detection, systematization, and monitoring of government procedures and, to that end, strengthening cooperation and exchange of best practices on the development and application of such technologies.

This issue brief examines the promise of tech solutions to assist the fight against corruption and profiles a number of such solutions, while identifying obstacles to their more widespread adoption and proposing appropriate policy responses.

Photo credit: Marcus Spiske / Unsplash

DIAGNOSIS: OPPORTUNITIES FOR EMPOWERMENT

In April 2015, a police officer in Charleston, South Carolina fatally shot an unarmed black man named Walter Scott. The killing was recorded on a smartphone camera by a bystander, and the smartphone video went on to serve as key evidence in the trial of the police officer, who was convicted of murder and sentenced to 20 years in prison.[9]

Smartphone footage of police officers in the United States killing unarmed black men has sparked a national conversation about police misconduct and encouraged a push for police officers to wear body cameras[10] to improve oversight and reduce impunity, and support officers who behave lawfully.[11] It is an example of the power of technology to empower citizens, spur reform, and improve government oversight and accountability, one that may resonate in countries such as Brazil that face similar challenges with excessive use of force by police.[12] What's more, the anticorruption protests that roiled Latin America and the Caribbean in 2015[13] and have continued periodically since then—including the more recent Haitian "Kot Kob Petwo Kariba a?"[14] (Where is the Petrocaribe money?) protests that called for accountability for hundreds of millions of dollars embezzled through the Venezuelan Petrocaribe program[15]—have created a climate wherein authorities are under pressure to clean house.

New technological developments such as the widespread adoption of smartphones hold enormous promise for empowering citizens to flag suspicious activity and providing good actors in government with the tools to detect, punish, and prevent corrupt or malicious activity.[16] Most Latin American governments have made important strides in improving government transparency, adopting right to information (RTI) laws[17] and increasing digitization and online publication of records.[18] All countries except Venezuela, Nicaragua, Cuba, Guyana, Suriname, Haiti, and Belize are part of the Open Government Partnership (OGP)[19] and have committed to varying action plans and reforms under the OGP framework.

However, implementation of these plans and policies is inconsistent and there remains a gap between what is promised and what is implemented: as the saying goes, "*entre dicho y hecho hay mucho trecho*" ("there is a long way to go between words and action.") Technology can be a crucial enabler in bridging this gap, in combination with the requisite political will, civil society oversight, and international cooperation.

The following is a mapping of the technological opportunities that exist to combat corruption in public procurement in the region, and corresponding challenges to their more widespread and effective adoption.

New technological opportunities hold enormous promise for empowering citizens to flag suspicious activity and providing good actors in government with the tools to detect, punish, and prevent corrupt or malicious activity.

1) Open data and e-procurement

According to the Inter-American Development Bank, "Manual government transactions, face-to-face interactions, and the lack of standardized processes mean that transactions are vulnerable to dishonest behavior."[20] While this is true for everyday government transactions by citizens, such as the solicitation of documents, it is magnified in processes of public procurement, where the potential for large illicit gains is greater. The more transactions take place digitally—through portals that are regulated by standards and constraints, and can be monitored—the more information on public contracting processes can be made public and tracked.

For instance, Mexico's National Commission on Hydrocarbons was featured in an OECD report[21] as maintaining good practices on public procurement due to its development of and adherence to online transparency guidelines, which mostly involved posting as much information on the tendering process as possible online and exchanging all documents electronically. This levels the playing field both by ensuring that everyone has the same information at once, and by giving public officials less discretionary personal influence over the process. The publication of this information in open data format[22] can allow civil society and other assigned monitors to play a leading role in identifying and denouncing corruption, especially if a government does not have the resources or political will to go after corrupt actors. Beyond simply publishing procurement data in open

format, the next step in streamlining the public procurement process is creating a fully digitized and automated e-procurement portal, which has been introduced in South Korea,[23] the Philippines, and Singapore, among others.

E-procurement cannot be left alone, however; it must be accompanied by regular audits and oversight by responsible agencies to prevent irregularities. This can be supported by Integrity Pacts,[24] which are effectively agreements between government agencies offering the contract and the companies bidding for it that they will not engage in corrupt practices for the extent of the contract, and which are overseen by civil society groups (such as Transparency International.)[25]

2) Smartphones and civic tech apps

The power of smartphone technology has been utilized by citizens to raise awareness of and call to account police misconduct in the United States[26] and Brazil[27], as well as expose misused public funds in Haiti.[28] Coupled with the disseminating power of social media, it has become a means to gather evidence of illegality and use it to demand political and judicial redress. The acceleration of smartphone adoption in Latin America[29] has resulted in the mushrooming of civic tech applications that aim to provide citizens with the information and means to hold authorities accountable, freely available on platforms such as apps4citizens[30].

Civic tech applications can enhance public procurement oversight by allowing citizens to track the progress of public works on the ground or report bribe-taking[31] by public officials. For example, Promise Tracker[32] in Brazil encouraged young Brazilians to use their smartphones to report deficiencies in public infrastructure and government services, such as in maintenance of bus stations, handicap accessibility of parks, quality of school lunches, and the like. Promise Tracker's citizen monitoring projects produced interventions by relevant authorities and a resulting improvement in some cases. Similarly, Supercivicos[33] in Mexico is an app that allows citizens in Mexico to take smartphone videos to report infrastructural or urban problems in their town, including but not limited to: illegal parking, overflowing trashcans, vehicular accidents, and sidewalk obstacles for more efficient treatment by managing authorities. In some cases, the monitoring produced timely intervention by the appropriate authorities, but in general both Promise Tracker and Supercivicos work to foster a culture of community responsibility and an expectation that government will work to strengthen accountability.

3) Big data and artificial intelligence algorithms

Widespread risk assessment is often beyond the capacity of manual analysis: there are often far too many datasets and variables for even experienced data analysts. In this respect, artificial intelligence (AI) algorithms—such as the European Commission's Arachne tool[34] and South Korea's Bid Rigging Indicator Analysis System (BRIAS)[35]—can be critical in identifying irregularities in public contracting processes and closely monitoring high-risk projects. The Arachne tool utilizes internal databases—e.g. of contracts, beneficiaries, and expenses—taken from a national managing authority, and external databases—e.g. of shareholders, subsidiaries and representatives of companies; politically exposed persons; sanctions lists; enforcement lists—comprised of hundreds of millions of names and cross-references with the aim of detecting high-risk projects. Meanwhile, BRIAS was developed to "identify cartel activity and potential cases of bid rigging in public procurement" and draws information from KONEPS—South Korea's e-procurement system—to look for anomalies in factors of public contracting processes, including price and number of bidders in order to produce an overall potential bid-rigging score that, if above a certain threshold, could be the basis for opening an investigation. Other data mining and analytics tools can, by taking large open datasets and thoughtfully cross-referencing, also be useful in identifying risky transactions.[36] With these tools, risk maps can be developed that shed light on illicit financial flows and sophisticated networks of corruption.

Publishing public procurement information in truly open data format can allow civil society and other assigned monitors to play a leading role in identifying and denouncing corruption, especially if a government does not have the resources or political will to go after corrupt actors.

4) Distributed ledger technologies

Distributed ledger technologies (DLT) such as blockchain can be hackproof methods for "the verification of identity, the registry of assets, and the certification of transactions"[37] in public contracting. These technologies are best suited for scenarios where the data itself is public, but there are questions about the trustworthiness of the entities responsible for updating the data.[38]

DLTs democratize the verification process for transactions and distribute the data management responsibilities for a series of transactions across multiple participants, all of whom have access to a data chain that is unbreakable due to the application of cryptographic math that will flag attempted tampering,[39] and all of which have real incentives to identify irregularities.[40]

FEATURE: CIVIL SOCIETY HACKS

Investigative journalism groups are often at the forefront of the movement using data for more accountability from public officials in Latin America. **Ojo Publico** was created in 2014 and has since done essential work in investigating corruption in Peru's government, particularly in relation to the Lava Jato scandal.[41] Information about the bribes and illicit funds involved in Lava Jato[42] was difficult to find because the Peruvian government does not have one concentrated contracting database, and information, if available, is scattered. Despite the important work that Ojo Publico is doing to bring information to light, it has very limited human resources. Ojo Publico's team is currently composed of ten employees: some journalists, some data engineers and some software developers.

Ojoconmipisto in Guatemala serves many functions: it is an investigative journalism outfit, manages a database of municipal public contracts, and solicits citizen denunciations of corruption for investigation.[43] It has launched various broad and detailed investigations, including "40 municipalities under a magnifying glass"[44] which serves as a database for the criminal histories and pending cases of officials in 40 municipalities, and allows for the download of its information in XML format. Ojoconmipisto also struggles with limited resources, compounded by the reluctance of the Guatemalan government to comply fully with right to information laws, forcing them to either undertake costly lawsuits or appeal for assistance to the Human Rights Ombudsman.

Observ Institute is a startup initiative whose goal is to enhance transparency and promote competition by making public bidding processes accessible to the general public.[45] By creating an algorithm to flag irregularities or possible cases of corruption in public procurement processes, Observ hopes to more efficiently weed out rigged bidding. Using machine-readable open data, citizens and watchdog organizations can help detect irregularities in government contracting. Experts at our roundtable underlined the importance of open-source algorithms to effectively analyze public contracting data, and to ensure efficient delivery of public services to citizens. The long-term goal of Observ is to transform the bidding processes in public infrastructure projects, both in Brazil and abroad. In other words, if this type of monitoring became a basic requirement for financing infrastructure projects going forward, improved practices can help rebuild public trust in government and in the private sector. Unfortunately, long-term funding for Observ has not been secured yet. In addition to this obstacle, some governments –especially smaller municipalities– are purposely opaque, making legal documents more difficult to understand and hampering the efforts of organizations like Observ.

CHALLENGES ADDRESSED*:

*see following section

CHALLENGES: WHAT IS LACKING

Although the aforementioned opportunities have the potential to mitigate or prevent corruption in public procurement, there are some fundamental obstacles to their adoption or their optimization. The following is a list of challenges faced by Latin American countries in the use of tech to fight corruption.

1) Collaboration across sectors

In many cases, civic tech applications were born out of the swell of indignation and hope for change engendered by Lava Jato and other corruption scandals in the region. Countering corruption was the clarion call of elected officials in many of the elections since, and civil society organizations—including investigative journalism platforms—have been working relentlessly to utilize new technologies and engage citizens in combating government graft.

However, civic tech apps and grassroots platforms to transparently publish government data often operate on a limited scale, or remain siloed insofar as they manage to engage the citizenry and raise awareness of corruption but do not catalyze movement on the part of government agencies. A central challenge is creating deeper links between civil society organizations that collect, mine and publish government data to expose corruption, and government agencies—regulatory, prosecutorial or judicial—to support exchanges of information and best practices that will ensure formal investigatory follow-up. A related challenge is providing consistent funding for these efforts: for example, the data journalism organization JOTA created an unprecedented public database of judicial information related to the Lava Jato case in Brazil called "Lava Jota."[46] The database was an essential resource for reporters, academics, and even members of the Lava Jato investigative task force.[47] However, it was launched as a pro-bono product by JOTA, and there was no funding provided to continue or expand it.

2) Better data

A central challenge in countries where corruption is rife is insufficient or inadequate public information. Even countries that purport to opening up sometimes do so selectively or insufficiently (a practice called "openwashing.")[48] Although Mexico, Brazil, Uruguay, and Colombia are ranked highly on the Open Data Barometer because of the considerable strides they have taken in the past five years in terms of making government data accessible and usable—often with the help of civil society organizations and multilateral development banks—and honorable mention is given to Chile and Argentina for their efforts in opening up, there is still a ways to go before any of those governments—much less ones such as El Salvador, or Honduras, or Bolivia—operate as truly open administrations as defined by the Open Data Charter.[49] The quality of government data is still variable across datasets and agencies, and is often incomplete, unverified, unreadable, not disaggregated, or not timely.

This is a significant challenge for many reasons: not only does bad data hamper transparency, but means that AI algorithms—and even smaller mechanisms to cross-reference data—cannot be applied. Such technologies are only relevant when data complies with certain readability and comparability standards.[50] In some of the more egregious cases, what is proffered are low quality photos or PDFs of documents that cannot be verified and are often incomplete. In Guatemala, for instance, investigative journalism outfits such as Ojoconmipisto stated the need to appeal to the Human Rights Ombudsman when their requests for public information under Guatemala's access to information law are rejected or ignored. Furthermore, freedom of information laws are often underenforced in the region, produce sub-par or incomplete responses to requests,[51] or are weakened when administrations inclined to opacity come to power.[52]

Freedom of information laws are often underenforced in the region, produce sub-par or incomplete responses to requests, or are weakened when administrations inclined to opacity come to power.

More broadly, there are many gaps in regional beneficial ownership information[53] regarding who owns or profits from certain companies, making it nearly impossible to get a full picture of a company's activity[54] and ensure that it is not facilitating or benefiting from illicit transactions. For example, many of the illicit payments made by Odebrecht's designated bribe division—called the Division of Structured

Operations—were carried out through offshore accounts registered to shell companies whose beneficial owners were shielded from view,[55] an arrangement facilitated by Odebrecht's use of "banks with distinct [bank secrecy] features that would aid in the [bribery] scheme."[56] Even when public contracting information is made public, it can be scattered across various databases, which makes it difficult to cross-reference and detect indicators of corruption or foul play. Opacity in public contracting is further exacerbated by the fact that public contracts are in many cases altered by "bankability amendments"[57] or addendums which, in the case of Odebrecht, were incorporated during renegotiations[58] and opened the door to the overvaluation of contracts that financed bribery. In many countries, such amendments are not subject to the same transparency requirements as the initial bidding process and contracts.

3) Making the most of available data

Even the countries that have made progress in providing open data often do so somewhat passively.[59] Governments might gamely create information portals (such as Chile's sleek lobbying information platform)[60] without proactively promoting how this information can be used by public officials to improve public procurement policies or oversight, or by civil society in a watchdog capacity. Meanwhile, civil society groups are not always well situated or resourced to maximize the potential of the data that governments have made available. Even cutting-edge groups such as Ojo Público in Peru often have just one or two data engineers/analysts on staff. As observers have noted,[61] there is often great hope for "big data" as a solution to government corruption, but rarely is there a focused effort that realistically takes into account the scope of available data.[62]

A compounding challenge is the steep learning and training curve faced by most countries in Latin America. Even in countries that have made progress, technical expertise is at times limited to a handful of government officials, and more broadly to a narrow segment of the population.[63] Technological training and capacity is not evenly distributed—if at all—between agencies in government, especially at the local and provincial level.

Distributed Ledger Technologies, especially, require buy-in from all actors in the public contracting process to be effective. The private sector is moving more quickly in this respect,[64] but dealing with government agencies using DLT-verified contracts is not possible unless the responsible government agencies have the capacity to operate it.

To even begin to utilize the AI algorithms mentioned above, or integrate DLTs requires an effective and comprehensive data storing and access infrastructure. To build that infrastructure, or use existing public infrastructure like Ethereum,[65] governments need not only hardware, software, and technology onboarding for government officials, but also the political will to create transparent public processes that become routine and foster a culture that counters corruption, especially in subnational localities that in many cases operate with little to no federal oversight.

FEATURE: PRIVATE SECTOR FUND FOR HACKS

The World Economic Forum's Partnering Against Corruption Initiative (PACI) and Citi convened a consortium of other private sector supporters and multilateral organizations—including the IDB, the International Monetary Fund, Mastercard, Facebook, and Price Waterhouse Coopers (PWC)—to launch **Tech for Integrity (T4I)**,[66] the goal of which is to identify, provide a platform for, and fund proposals for technology to combat corruption. T4I contestants submit proposals and finalists participate in a virtual accelerator program with mentoring and support. In the inaugural program in 2017, over two-hundred and thirteen participants from thirty-four countries were selected and over $5 million was awarded in kind to different start-up technology solutions. In the process of designing T4I, Citi worked with its partners to identify over seventy-three "Integrity Pain Points" for participants to focus their efforts on. Transparency in procurement processes and tools to increase transparency were, unsurprisingly, identified as top issues for developers.

CHALLENGES ADDRESSED:

POLICY RECOMMENDATIONS

For communities in Latin America, especially on a local or provincial level, transparency in public administration and procurement—not to mention digital transparency—might seem prohibitively difficult or expensive. In a region where informality and discretion—in government procedures, public contracting, and everyday business transactions[67]—remains common, convincing the government and private sector counterparts to operate in non-negotiable, rule-governed digital space is not always easy. But it is not out of reach, thanks to the confluence of social media, growing digital literacy, and an energized civil society, as well as new technological tools that make the detection and prevention of corruption easier than ever before. The following recommendations aim to serve as a starting point for those in governments, the private sector, and civil society who seek to maximize the use of digital tools to enhance transparency and accountability.

1. WORK TOGETHER TOWARD TRULY OPEN DATA

Adopt international public contracting data standards.

Latin American countries don't need to reinvent the wheel. There is an abundance of resources on how to record and publish truly open data. The open data charter[68] which has been adopted by Argentina, Chile, Colombia, El Salvador, Guatemala, Mexico, Panama, Paraguay, and Uruguay–and the G20 Open Data Principles[69]–laid out and adopted by G20 countries in 2015–serve as good starting points, with more technical guidance given by the Open Contracting Data Standard (OCDS).[70] In short, make sure the data is readable, comparable, free, downloadable, disaggregated, timely, concentrated, and complex. Governments—supported by multilateral development banks—should take these standards and move beyond simple norms to legislate a national public contracting data publishing standard that can then be enforced, and which agencies can be held accountable to. This should go hand in hand with investment in and capacity building for the construction and maintenance of national open contracting data portals that will be integrated into the public contracting process and disclose up-to-date information on bids and progress in real time.

Disclose all information on beneficial ownership and contract renegotiations.

Disclosure of government data is not enough if it is not accompanied by transparency regarding private companies bidding for public contracts. As such, beneficial ownership transparency regulations should be strengthened to facilitate scrutiny and deter corruption.[71] Countries should meet the standards of transparency established by the Financial Action Task Force (FATF)[72] and the Global Forum.[73] Automatic verification can be facilitated using distributed ledger technologies, and algorithms can be developed to flag irregularities for further investigation. Furthermore, to prevent the facilitation of bribes through covert "addendums," any changes made to the original contract should be made public.

2. FOCUS ON DATA DELIVERABLES AND LONG-TERM DIGITAL CAPACITY BUILDING PLANS

Identify common corruption correlations and consistently cross-reference datasets.

Coming up with targeted goals is key to identifying the kind of patterns inherent to corrupt networks and state capture, such as the overlap between campaign financing and public contracts. For instance, 15 of the top 20 major campaign finance donors in Brazil were involved in Lava Jato, and research in the United States shows that corporate donations to politicians can steer contracts in the direction of the donor entities, especially in a weak institutional environment.[74] Governments and civil society organizations should explore the potential of data mining algorithms and targeted data analysis, for example by consistent cross-referencing of campaign finance and public contracting datasets, to track moneyed influence and keep a close eye on risky actors.

Beneficial ownership transparency regulations should be strengthened to facilitate scrutiny and deter corruption.

Onboard tech and publish data with a clear anticorruption purpose.

In situations of state capture or other entrenched corruption networks, the removal of individual corrupt entities alone will not change the logic of the system. Aggressive prosecutions like Lava Jato must be accompanied by long-term and far-reaching digital training plans, with the aim not of just uploading as much data as possible, but doing so with express anticorruption goals. Creating national or localized AI programs such as the European Commission's Arachne tool or South Korea's BRIAS can help with the identification of risky projects or entities within the masses of government contracting data and therefore can help governments preempt corrupt acts through close monitoring of high-risk projects. If and when the capacity exists, thinking about the application of DLTs to manage public contracts could be beneficial. Governments[75] and private sector initiatives[76] are quickly moving to sponsor experimental development of potential blockchain applications; for example, Argentine company Signatura's Teneris product[77] promises to apply DLT to document exchanges–such as bids and contracts–in public procurement processes to ensure integrity. DLTs make entity and document verification easier because the costs for tampering with contracts are raised: to tamper with any piece of data on the network, a user would need to compromise the entire network, which is an enormously capital-intensive undertaking for sufficiently large networks. Furthermore, in the context of public administration, in distributing rewards for identifying irregularities that are themselves dependent on the continuing integrity of the system (e.g. giving monitoring users rewards in Bitcoin or other cryptocurrencies that are only valuable if the DLT continues to be effectively monitored), DLTs can create a feedback mechanism for integrity monitoring that reinforces itself and deters or derails potential corruption. Government officials in agencies tasked with managing the bid process and overseeing project implementation, as well as those in public prosecutors' offices, should be trained in using these technologies.

3. CREATE PROACTIVE TECH-FOR-TRANSPARENCY PARTNERSHIPS WITH CIVIL SOCIETY

Establish exchanges of best practices.

In many cases, under-resourced government agencies can benefit from civil society groups already doing the anticorruption legwork.[78] Government agencies and officials in charge of investigations and policy concerning public contracting should routinely reach out to and collaborate with organizations that specialize in identifying

FEATURE: GOVERNMENT HACKS

On the government side, one initiative that is helping to increase transparency is the **MapaInversiones (Investment Map)** project, funded by the Inter-American Development Bank (IDB) and Microsoft in partnership with the governments of Paraguay, Costa Rica, and Colombia to create maps of all public investment around the countries.[79] The initiative stems from a pilot project, MapaRegalias (Royalties Map),[80] which was initiated in Colombia in 2013 and displayed all of the public projects funded by royalties. The project required certain municipalities to disclose financial information related to public projects, and lack of compliance resulted in a withholding of funding for projects. In 2016, 125 municipalities in Colombia were found lacking, and were consequently not granted as many funds or resources. The MapaInversiones project aims to repair asymmetries in information between governments and the public through open data and interactive tools. MapaInversiones also allows citizens to supervise, close to real-time, public contracts and investments. At the time of writing, MapaInversiones had made public over $8 billion of public works in Costa Rica, and over $4 billion in Paraguay. The projects mapped had an 11 percent increase in efficiency in Colombia and increased return on investment in Paraguay and Costa Rica as well.

CHALLENGES ADDRESSED:

and exposing corruption, such as civic technology groups and data-driven investigative journalism platforms, to remain up to date with best practices and new programs, as well as to gain insight on how to train personnel in monitoring for corruption. Governments and/or private companies could also serve as sources of funding for projects with great anticorruption use or promise.

Appoint a clear point of contact within government agencies to be accountable to tech-enabled whistleblowers.

Civic tech applications can be key tools for safe and effective whistleblowing. Governments should designate an official in relevant government agencies—police, prosecutor offices, project management agencies, or the like—to be responsive to civil society and private sector organizations that want to present evidence of corruption and share their work or their tools for detecting it. Furthermore, creating explicit whistleblower protections for those that choose to denounce misconduct by public officials through apps is essential in encouraging them to keep doing their work.

4. ENLIST THE PRIVATE SECTOR

Work toward the scalability of efficient test pilot programs.

Private sector-supported initiatives such as Tech for Integrity and other "sandbox" programs that give seed money to test pilot programs in the anticorruption space are essential in maximizing the potential and efficiency of new tech. Through increased adoption and knowledge of new technologies that maximize and promote transparency, the private sector could help reduce the risk of corruption in doing business.

Reward transparency and "clean" business practices.

The risks of engaging in corruption for the private sector are well documented–according to a PwC survey, 44 percent of global executives said they avoided certain markets because of corruption, and 40 percent had lost bids because of corrupt officials. Consciously avoiding or refusing to do business with certain governments if they have not complied or are not on their way to compliance with the above transparency standards is another way to help raise the standard for doing business as a whole. The private sector can work towards the creation of "badges" or "awards" for governments that comply with the highest transparency standards.

Follow-up is an essential factor to realize the potential for new technologies. As governments, civil society groups, and the private sector begin to undertake the aforementioned reforms, they should establish mechanisms for oversight or tracking of success, with details of progress made public and comprehensible in a timely and transparent fashion.

Aggressive prosecutions like Lava Jato must be accompanied by long-term and far-reaching digital training plans, with the aim not of just uploading as much data as possible, but doing so with express anticorruption goals.

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