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Literature review: The use of ICTs in the fight against corruption

Query

What are the experiences and the lessons learnt on the effectiveness of using ICTs for accountability? What are the experiences in fragile situations versus more stable environments?

Content

1. The role of ICTs for fighting corruption: a general overview
2. ICT tools for transparency and accountability
3. ICT tools for social mobilisation
4. Appendix: types and examples of ICT innovation for anti-corruption

Caveat

This literature review is an update of a 2013 Helpdesk answer on [the role of technology to identify and reduce corruption](#) and, as such, primarily focuses – with a few exceptions – on literature published after 2013.

Summary

E-governance has gained popularity in recent years, with many countries resorting to information communications technology (ICTs) to modernise government, increase efficiency and improve public service delivery. As an additional benefit, ICTs are also expected to reduce corruption by promoting transparency, opening government data to public scrutiny, and by automating government processes, restricting discretion of officials and limiting citizens' interaction with gatekeepers to access key services. Despite these high expectations and massive investments in e-government, evidence of impact is mixed and limited and there is a high rate of failure of e-government projects, due to contextual factors as well as the type of the ICT interventions. This Helpdesk answer provides an overview of recent literature on the role of ICTs and government to combat corruption in key government processes such as procurement, taxation, human resource management, open data and service delivery. It also explores the potential of ICTs and social media for citizens' mobilisation and empowerment.

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U4 is a resource centre for development practitioners who wish to effectively address corruption challenges in their work. Expert Answers are produced by the U4 Helpdesk – operated by Transparency International – as quick responses to operational and policy questions from U4 Partner Agency staff.

1. The role and impact of ICTs for fighting corruption: a general overview

Experience of using ICTs as an anti-corruption tool

In recent years, many countries have enthusiastically embarked on major e-government projects, using new technologies to improve and modernise government processes and make them more efficient. They have also enabled citizens' empowerment by (1) enabling downward flows of information, from government to citizen, (2) creating the possibility of upward flows of information, from citizen to government, essential to informed decision making, and (3) enabling horizontal flows of communication, flattening hierarchies (Bailur and Gigler 2014).

While many initiatives do not primarily and explicitly aim at addressing corruption challenges, there are many expected anti-corruption benefits associated with e-government (World Bank 2016; Dupuy and Serrat 2014; Zinnbauer 2012):

- reducing information asymmetries between office holders and citizens, enabling the latter to assert their rights without corruption interfering
- limiting the discretion of office holders, reducing their opportunities to extract bribes
- streamlining and automating specific processes to reduce interactions between office holders and citizens that can create opportunities for the development of corrupt networks
- removing intermediaries that often facilitate bribery
- reducing red-tape in public bureaucracies and thus remove potential entry points for corruption
- increasing the transparency of transactions with public officials, making them audit-able to deter corrupt behaviour
- providing a growing repertoire of collective action tools and platforms for citizens to organise, report and mobilise against corruption
- receiving feedback and reports from service users to regularly track satisfaction, identify problems, report corruption and improve service quality

ICT interventions can be broadly categorised into two different types of interventions: 1) transactional reforms seeking to control and automate government processes, restrict discretion of officials and increase detection of corruption; and 2) transparency reforms that focus on opening up

the state and increasing the flow of information from government to citizens, making the actions of the state and its agents more visible to citizens, civil society and the private sector (Davies and Fumega 2014). (A categorisation of ICT interventions respectively relating to transparency and transactional reforms can be found in the appendix).

In their conceptual framework of digital engagement, Peixoto and Fox (2016) introduce an additional dimension, linking ICT-enabled opportunities to express voice (citizen uptake) – “yelp” – and the degree to which public service providers respond to expressions of citizen voice – “teeth”. They further distinguish between various forms of accountability that can be facilitated by ICT interventions, including “upwards accountability” – when users provide feedback directly to decision makers allowing them to identify and address service delivery problems at their discretion – and “downwards accountability” – when service providers are held accountable by citizen voice and action.

There are many examples across the developing world of how ICT interventions have been used as anti-corruption tools to meet these objectives. They can be can be government or civil society led and be broadly categorised into (Dupuy and Serrat 2014): 1) transparency portals – platforms that offer timely publication of key government documents online; 2) open data portals – platforms that provide free access to data sets in machine-readable formats; 3) service automation – platforms that replace discretionary decision making by public officials with auditable software processes; 4) online services – platforms that allow citizens to self-serve for public service access; 5) online right to information platforms allowing citizens to file right to information requests; 6) crowdsourced reporting – platforms that allow citizens to report corruption or grievances and publicly share data on reports and trends; 7) online corruption reporting – platforms that allow citizens to report corruption or grievances; and 8) issue reporting – platforms that allow citizens to report problems with public services. Except for service automation, most of these interventions relate to transparency reforms.

The scope and ambition of public ICT initiatives are extremely broad and varied and have been implemented in many sectors traditionally vulnerable to corruption. While taxes and government contracts are areas where e-government has been seen as a clear and successful solution to corruption problems in many nations (Bertot et al. 2010), generally, countries

have invested less in e-procurement than in more complex budget or treasury systems (World Bank 2016). There are also many opportunities to use ICTs to modernise and improve the quality of human resource (HR) management systems and service delivery and reduce opportunities for abuse. Many countries have developed open data initiatives in recent years, including an increasing number in developing countries, such as in Brazil, India and Kenya (Davies and Fumega 2014). Social media and ICTs can also be used for social mobilisation and citizen empowerment, with some evidence of internet and Facebook penetration having a sizable and negative impact on corruption (Jha and Sarangi 2014).

While there are examples of ICT tools and interventions in fragile and conflict-affected countries, such interventions are still a new approach and a topic that has only recently emerged in analytical literature. There is therefore little information available on the specific challenges associated with using new technologies in fragile settings (Schouten 2013).

Indication of effectiveness and impact

The expectations associated with the potential of ICTs to address corruption stand in contrast to a so far limited and mixed evidence base (Zinnbauer 2012).

There is positive evidence confirming a beneficial potential of new technologies to reduce corruption. Some studies empirically confirm that e-government, ICT development and internet penetration are negatively correlated with corruption (Shrivastava and Bhattacharjee 2014; and Elbahnasawi 2014), suggesting a causal relationship between e-government and corruption. There are also examples of the positive impact that some ICT interventions have had on the perception of corruption, such as the well documented Seoul Metropolitan Government's Online Procedures Enhancement for civil applications (OPEN) system (Kim, Kim & Lee 2009).

However, other studies and lessons from technology adoption point to high risks of failure or inefficacy (Zinnbauer 2012).

According to the World Bank 2016 World Development Report, digital technologies have had varying impacts. While they have had a clear impact on addressing a lack of information and transparency, they have been less effective in solving government failures associated with rent-seeking and in strengthening the incentives of

government bureaucrats and service providers to perform. Automating government processes has been partially successful, with a high failure rate of these often complex and costly systems. Even in countries with advanced e-government systems, their use remains surprisingly low, as many citizens prefer traditional ways of interacting with the government such as by phone or mail.

Citizen feedback systems have reduced problems such as petty corruption or poor services in the Dominican Republic, Nigeria and Pakistan, but are only effective when citizens have an incentive to provide feedback and the services are fairly easy to monitor, and when governments have the capacity to respond to this feedback. While there are examples where digital technologies have helped reduce absenteeism, they have not significantly improved service provider management in government bureaucracies (World Bank 2016).

A review of empirical evidence linking ICT-enabled voice mechanisms and institutional responsiveness suggest that while ICT platforms have been relevant in increasing policy makers' and senior managers' capacity to respond and can make a big difference where senior managers are already committed to using feedback to bolster their capacity to respond.

However, these cases suggest that while ICT platforms have been relevant in increasing policy makers' and senior managers' capacity to respond, most platforms have yet to influence their willingness to do so. Where such willingness is absent, the question is how ICT platforms can enable the collective action needed to give citizen voice some bite (Peixoto and Fox 2016).

The introduction of e-governance and ICT may also not be equally effective on all types of corruption. Evidence from Bangladesh indicates that such approaches can be effective to address petty corruption involving street-level bureaucrats, but less so for dealing with grand corruption involving higher level officials (Baniamin 2014).

Lessons learnt

There is in fact ample evidence that functionalities and impact are less predetermined by technological properties than by contextual factors and circumstances (Zinnbauer 2012).

A number of contextual factors are important to consider for effectively addressing corruption through e-governance, including technology

access and literacy, with the need to provide training to enable broad participation in e-government services, technology penetration, technology capabilities and access of government agencies, as well as social and technology readiness of citizens (Bertot et al. 2010). Beyond the technology itself, legal frameworks, organisational processes, leadership and campaign strategies may all be necessary complements of digital tools in order to secure effective change (Davies and Fumega 2014).

Other key factors that can influence the effectiveness of such interventions include the types of e-governance, the configuration of the system, and its level of maturity (Baniamin 2014). But while it is important to address these technological challenges to promote universal access, the technology itself is only one side of the challenge for addressing corruption with ICTs.

A strong determinant of the success of e-government projects is the acceptance of the initiative by government officials as well as issues of implementation, education and culture, as well as citizens' readiness to use ICTs, among others (Bertot et al. 2010).

Transparency alone can only be a starting point for addressing corruption. Change requires individuals, groups and institutions who can access and respond to the information. Therefore, the potential of ICTs to address corruption depends both on citizens' access to technology, with a risk of leaving those unconnected behind where access is not universal (World Bank 2016) as well as on citizen engagement in a local context (Davies and Fugemera 2014).

Many factors affect the way in which citizens can engage through technology to provide feedback or report corruption to government or act upon information provided by government. Context matters in this regard, and ICTs that worked in one context might not achieve the same results in a different setting (Davies and Fugemera 2014).

The presence or absence of certain elements can help lower barriers to uptake and engagement. In particular, the media and transparency-oriented NGOs can increase the potential of ICTs for anti-corruption purposes. Media campaigns, skilled intermediaries and NGOs can amplify, translate and make sense of information, ensuring greater outreach and impact. A clear theory of change and a comprehensive anti-corruption strategy, together with the inclusion of offline tools to reach as many

users as possible, are necessary for ICT initiatives to achieve real impact (Davies and Fumega 2014).

2. ICT tools for transparency and accountability

e-Government

E-governance is gaining popularity as a tool for improved public service delivery and reduced corruption in developing countries. Case studies and statistical analyses indicate that ICTs can help address corruption by automating and streamlining government processes, restricting discretion of officials and the need for citizen interaction with gatekeepers for key services, improving monitoring of public officials and by enhancing the effectiveness of internal and managerial control over corrupt behaviours. It may also enhance accountability and transparency by disseminating a greater quantity and a higher quality of information in the economy, which incites citizens and businesses to question arbitrary decisions and unreasonable procedures. Thus, e-government may possibly eliminate many opportunities for corruption. This is corroborated by a number of case studies and empirical research that indicate that link ICT development, e-government and reduction of corruption (Shrivastava and Bhattacharjee 2014; Elbahnasawi 2014).

However, e-government is not a silver bullet for addressing corruption. In fact, despite massive investment in information technology in recent years in many countries, various estimates indicate that many e-government projects fail: about 30% of these projects are total failures, with the project abandoned before completion and fewer than 20% are considered successes. In some cases, even if e-government projects are successfully implemented, they may actually worsen outcomes and provide new opportunities for corruption, as, without proper regulatory safeguards in place, automation can make it easier to perpetrate fraud and corrupt practices, and to erase records or avoid capturing them altogether, thereby eroding transparency mechanisms (World Bank 2016).

Digital Dividends

World Bank. 2016.

World Development report

<http://www.worldbank.org/en/publication/wdr2016>

The report looks at the impact that the significant investments in e-government have had across the world, including strengthening government capability to deliver services and expanding citizen

participation. Providing many examples from countries across the world, it concludes that while digital technologies have spread rapidly in much of the world, their broader development benefits have lagged behind. In many instances, digital technologies have boosted growth, expanded opportunities, and improved service delivery, but their aggregate impact has fallen short and is unevenly distributed. Increasing impact requires not only closing the remaining digital divide, especially in internet access but also broader accompanying reforms such as strengthening regulations that ensure competition among businesses, by adapting workers' skills to the demands of the new economy and by ensuring that institutions are accountable.

Understanding the Role of Technology in Reducing Corruption: A Transaction-Cost Approach

Prasad and Shivarajan. 2015.

Journal of Public Affairs Volume 15 Number 1

https://www.researchgate.net/publication/271856148_Understanding_the_role_of_technology_in_reducing_corruption_A_transaction_cost_approach

This paper seeks to advance the understanding of the process through which computer-mediated transactions reduce corruption and what types of computerisation initiatives can help reduce corruption. Using a transaction-cost economics framework, the authors argue that uncertainty – resulting from the lack of or ambiguity of information regarding the procedures, rules and regulations that are applicable to the transaction and asset specificity – defined as the situation in which managers are compelled to interact with government agents for services that are not available through any other source associated with government transactions, allow bureaucrats to act opportunistically and demand bribes. Therefore, computerisation initiatives that reduce uncertainty and asset specificity of government services lead to lowered perceptions of corruption. A survey of 101 managers of domestic and multi-national enterprises in India, supports these hypotheses.

Closing the Feedback Loop: Can Technology Bridge the Accountability Gap?

Bailur and Gigler. 2014.

http://elibrary.worldbank.org/doi/abs/10.1596/978-1-4648-0191-4_ch1

This paper argues that while ICTs cannot ensure empowerment, they can potentially expand political, social and economic freedom, given the necessary relevant socio-cultural, technical, economic and political conditions. Instead of

assuming that more technology leads to more political engagement, other factors necessary for empowerment need to be taken into consideration in addition to technology before predicting citizen engagement, including historical and long-term patterns of engagement, personal and group dynamics, and political, social, economic and financial conditions. The paper concludes that ICTs do enable citizen empowerment by: (1) enabling downward flows of information, from government to citizens; (2) creating the possibility of upward flows of information, from citizens to government, essential to informed decision making; and (3) enabling horizontal flows of communication and flattening hierarchies.

ICT Development and Corruption: An Empirical Study

Shrivastava and Bhattacharjee. 2014.

Twentieth Americas Conference on Information Systems, Savannah

This study investigates the relationship between ICT development at the country level and prevailing corruption after controlling for political, economic and social factors. It also studies the relationship between corruption, government effectiveness and economic efficiency. Using the ICT development index (IDI) as the measure of ICT development, and corruption perception index (CPI) as a measure of country-level corruption, an analysis of 98 countries for the year 2010 shows that ICT development is negatively related to corruption, which in turn, is negatively related to government effectiveness and economic efficiency.

E-Government, Internet Adoption, and Corruption: An Empirical Investigation

Elbahnasawi. 2014.

World Development Vol. 57, pp. 114–126

[https://www.researchgate.net/publication/260008081_E-](https://www.researchgate.net/publication/260008081_E-Government_Internet_Adoption_and_Corruption_An_Empirical_Investigation)

[Government_Internet_Adoption_and_Corruption_An_Empirical_Investigation](https://www.researchgate.net/publication/260008081_E-Government_Internet_Adoption_and_Corruption_An_Empirical_Investigation)

This study empirically investigates the impact of e-government and internet adoption on curbing corruption. The results reveal that e-government is a powerful tool in reducing corruption – via telecommunication infrastructure and the scope and quality of online services – which is strengthened by greater internet adoption. The interaction effects between e-government and internet adoption suggest both as complements in anti-corruption programmes. In addition, e-government reinforces the influence of law enforcement on corruption reduction. The human capacity component of e-government does not seem to affect corruption under any specification.

Therefore, the authors conclude that e-government reduces corruption by expanding the access to information and raising the level of corruption awareness, which increases transparency and improves accountability.

This paper also provides evidence on the causal relationship between e-government and corruption, which conclusively runs from e-government to corruption, but not the other way round.

Fighting Corruption with ICT: Strengthening Civil Society's Role

Dupuy and Serrat. 2014.

<http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1413&context=intl>

With ICTs, civil society plays an increasing role in governance, promoting transparency and accountability to tackle corruption. Development agencies can strengthen civil society-led, ICT-driven anti-corruption initiatives by funding projects and programmes that foster institutional environments conducive to participation in public affairs, promote cooperation and mobilisation, and develop capacities.

E-government as an Anti-Corruption Tool: Citizens Perceptions

Abu-Shanab, Harb and Al-Zoubi. 2013.

International Journal of Electronic Governance Vol. 6, No. 3.

https://www.researchgate.net/publication/260870254_Government_as_an_Anti-Corruption_Tool_Citizens_Perceptions

This study tried to assess the literature and better understand how e-government can fight administrative corruption. It explores Jordanians' perceptions towards e-government and anti-corruption, assessing how e-government is perceived as an anti-corruption tool, using a survey of 390 respondents, where three major dimensions that contribute to fighting administrative corruption were explored, including public performance efficiency, transparency measure and citizen satisfaction with public services. Results emphasised the importance of all items. In particular, e-government was perceived highly in terms of its potential to reduce time and cost of service, facilitate easy information access, convenient service, and faster and quality service. On the other hand, Jordanians considered weaker links with factors like: transparency and objectivity, better recruitment process, objective system to evaluate employees' performance, provision of budget information and expense control systems.

Using ICTs to Create a Culture of Transparency: E-Government and Social Media

as Openness and Anti-Corruption Tools for Societies

Bertot, Jaeger and Grimes. 2010.

Government Information Quarterly 27 (2010) 264–271.

http://www.academia.edu/6082729/Using_ICTs_to_create_a_culture_of_transparency_E-government_and_social_media_as_openness_and_anti-corruption_tools_for_societies

This paper explores the potential impacts of information and ICTs – especially e-government and social media – on cultural attitudes about transparency. It concludes that technology development may not be the primary concern for impact, as a range of nations with varying technology infrastructure have created numerous procurement, tracking, anti-corruption and other systems to create a culture of transparency. Instead, technology access and literacy is seen as instrumental, with the need to provide training, and engage in usability, functionality and accessibility testing to ensure the broadest ability to participate in e-government services. Critical success factors include: 1) a culture of transparency embedded within the governance system; and 2) a transparency “readiness” factor – that is, factors on the ground such as technology penetration, technology capabilities and access of government agencies, and social and technology readiness of citizens.

Anti-Corruption Initiatives and E-Government: A Cross-National Study

Kim. 2013.

Public Organization Review. 2014. 14:385–396.

https://www.researchgate.net/publication/257639896_Anti-Corruption_Initiatives_and_E-Government_A_Cross-National_Study

This paper discusses various approaches of anti-corruption initiatives and conducts statistical analyses on aggregate data of more than 200 different countries to find relationships between e-government and anti-corruption in government. Findings indicate that e-government could be an effective tool to curb corruption in government despite rule of law being the most powerful predictor of anti-corruption as well as a fundamental precondition of a clean government. E-government enables citizens to have access to government information and services and reduces unnecessary interventions and arbitrary behaviours of government officials. Findings also indicate that if digital government is strengthened with high-quality public bureaucracies consisting of competent public agents, anti-corruption efforts could more effectively lower the corruption levels of public affairs.

E-Government, Internet Adoption, and Corruption: An Empirical Investigation.

Elbahnasawy, Nasr C. 2010.

World Development Vol. 57, pp. 114–126

[https://www.researchgate.net/publication/260008081_E-](https://www.researchgate.net/publication/260008081_E-Government_Internet_Adoption_and_Corruption_An_Empirical_Investigation)[Government_Internet_Adoption_and_Corruption_An_Empirical_Investigation](https://www.researchgate.net/publication/260008081_E-Government_Internet_Adoption_and_Corruption_An_Empirical_Investigation)

This paper empirically investigates the role that e-government and the level of internet adoption play in reducing corruption, both in developed and developing countries. The paper takes a quantitative approach to test the impact of ICTs on corruption and relies on a dataset which covers 160 countries over a period of 15 years (1995 to 2009). The results show that e-government is linked to reductions in the level of corruption. These results are robust and not dependent on model specification. On the contrary, the impact of the extent of internet adoption on corruption reduction is ambiguous and seems to be sensitive to model specification.

False Dawn, Window Dressing or Taking Integrity to the Next Level? Governments Using ICTs for Integrity and Accountability

Zinnbauer. 2012.

Transparency International

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2166277

This article explores the expectations and challenges involved with using ICTs to tackle a wide variety of corruption issues that affect public bureaucracies. It explores four concrete application areas where governments are particularly focused on deploying ICT solutions with the express (although not exclusive) aim to tackle corruption, including electronic reforms in public procurement, judicial case management, tax administration and ID card systems, providing examples of technology applications, a first overview of the empirical evidence base on impact and the status of related advocacy and monitoring by civil society are discussed.

E-government as an Anti-Corruption Strategy

Anderson. 2009.

Information Economics and Policy, 21, 201–210

<http://www.sciencedirect.com/science/article/pii/S0167624509000110>

By analysing changes between 1996 and 2006 corruption data through ICT-enabled e-government initiatives, this study concludes that “implementing e-government significantly reduces corruption, even after controlling for any propensity for corrupt

governments to be more or less aggressive in adopting e-government initiatives”. The paper provides several examples of successful initiatives.

An Institutional Analysis of an E-Government System for Anti-Corruption: The Case of OPEN

Kim, S., Kim, H. J., & Lee, H. 2009.

Government Information Quarterly, 26, 42–50

<http://www.sciencedirect.com/science/article/pii/S0740624X08001172>

The Seoul Metropolitan Government's Online Procedures Enhancement for civil applications (OPEN) system is often referred to in the literature as an anti-corruption e-government initiatives. Launched in 1999, it has multiple distinct anti-corruption measures embedded into the functions of the system. The aim of OPEN was to streamline government processes and reduce the places of direct interaction between government officials and citizens. OPEN initially covered government services where corruption had been deemed most likely to occur, with citizens able to follow up their status and the relevant government officials online. The OPEN system itself continually checks for delays in processing, requesting government officials to justify such delays. Studies have credited OPEN with reducing corruption and increasing transparency. The system has also dramatically changed perceptions of the residents of Seoul about corruption, with the large majority of citizens crediting OPEN with noticeably reducing government corruption in its first five years of operation.

Open data

Open data refers to the publication of public data online by the government allowing third parties to analyse and use the data for various purposes. Many countries have developed open data initiatives in recent years, including an increasing number in developing countries such as Brazil, India and Kenya. Published data can range from information on the locations of public services, and government service performance statistics, to public transport timetables, government budgets, and environmental monitoring data (Davies and Fumega 2014).

While not all of this data is useful for anti-corruption work, open data enables third parties to analyse a wide range of government datasets that may help detect areas of concern. However, open data can only have an impact on corruption if skilled intermediaries access, interpret and work with the datasets published (Davies and Fumega 2014).

Open Data as a Tool to Fight Corruption

Granickas. 2014.
European Public Sector Information Platform Topic Report N 2014/04
<https://ofti.org/wp-content/uploads/2014/05/221171136-Open-Data-as-a-Tool-to-Fight-Corruption.pdf>

This report provides a non-exhaustive overview of how release and re-use of open data can help curb corruption in a number of sectors by suggesting a list of relevant data that can be released in a particular context and demonstrating good practice examples. It concludes with a number of recommendations to governments towards realising the potential of open government data as an anti-corruption tool. These recommendations include: 1) linking/integrating open data and anti-corruption policies; 2) providing data in accordance with accepted openness standards (open formats, free of charge, timeliness, etc.); 3) prioritising datasets with the highest impact, including public accountability data; 4) providing relevant data pro-actively.

Open Governments, Open Data: A New Lever for Transparency, Citizen Engagement, and Economic Growth

Gurin. 2014.
SAIS Review of International Affairs, Volume 34, Number 1
https://www.researchgate.net/publication/265983481_Open_Governments_Open_Data_A_New_Lever_for_Transparency_Citizen_Engagement_and_Economic_Growth

This paper explores the drive to open data and how it unfolds in different ways around the world. In developed countries, where the economic value of open data is now recognised, countries such as the United States' and United Kingdom's national open data policies are setting a model that other countries have started to follow. In developing countries, open data has been a lower priority and challenging due to limited resources, poor data collection, and political and legal issues interfering with open data's effective usage. However, some developing countries are beginning to develop programs to release open data. The paper provides numerous examples of initiatives by private companies, governments or civil society to open data across the world.

e-procurement

Taxes and government contracts are areas where e-government has been seen as a clear and successful solution to corruption problems in many

nations (Bertot et al. 2010). ICTs have been increasingly used by governments in the acquisition of goods and services, the allocation of contracts to bidders and in contract management (e-procurement). E-procurement can result in significant budgetary savings and better quality infrastructure by promoting greater transparency, increased competition and reducing discretion. In India and Indonesia, for example, this resulted in increasing the quality of the infrastructure projects through shorter delays and better construction (World Bank 2016). However, e-procurement is not enough to effectively detect and address corruption and needs to be accompanied by measures promoting coherent legal frameworks, training and oversight capacity as well as enforcement (Martini and Luijken 2014).

The Role of Technology in Reducing Corruption in Public Procurement

Martini and Luijken. 2014.
Transparency International
https://www.transparency.org/files/content/corruptionqas/The_role_of_technology_in_reducing_corruption_in_public_procurement_2014.pdf

The benefits of e-procurement are many and include improvements in market access and competition, promotion of integrity, reduced information costs, easier access to information, and increased transparency and accountability, among others. In this context, e-procurement also has the capacity to prevent and reduce the opportunities for corruption in the different stages of public procurement. Countries such as Albania, Georgia and South Korea have improved their procurement systems and mitigated the opportunities for corruption by publishing information on procurement online, standardising and streamlining processes, and facilitating control and oversight over the procurement cycle. Nevertheless, the establishment of e-procurement as a standalone reform is unlikely to bring about positive transformational results. Countries have to invest in coherent legal frameworks, training and oversight capacity to ensure that the potential benefits of e-procurement in terms of reducing corruption are exploited to their maximum.

ICT for Open Contracting in Fragile and Conflict Affected States

Schouten. 2013.
International Bank for Reconstruction and Development/The World Bank
https://issuu.com/ngarza/docs/ict4open-contracting_fcs

This report identifies efforts to use ICTs – from the use of mobile technology to open data portals – for

fairer and more inclusive, transparent and accountable public resource management. Drawing on available literature and interviews with practitioners and users in fragile and conflict-affected countries, the research identifies approaches to ICTs that can lead to a real impact in fragile and conflict-affected countries. The research maps innovative tools and captures challenges and implications for the use of ICTs for open contracting in situations of conflict and fragility, including case studies on budget transparency and e-procurement portals in Timor Leste, ICT-enhanced procurement monitoring in Nigeria, ICT for accountable development in Afghanistan and tracking development promises in Liberia. It is important to note that this study provides an overview of tools and emerging lessons as ICT-enhanced accountability is still a new approach in many fragile and conflict-affected states and a topic that has only recently emerged in analytical literature.

Tax administration

Some countries have also dealt implicitly or explicitly with corruption in tax administration by computerising and automating tax administration with the specific purpose of reducing direct contact between citizens and tax officials. In particular, electronic filing and payment systems are instrumental to reduce tax administration costs and the scope for bribery and corruption (Araki and Claus 2014).

The Impact of ICT on Taxation: The Case of Large Taxpayer Department of Tanzania Revenue Authority

Chatama. 2013.

Developing Country Studies Vol.3, No.2, 2013

<http://www.iiste.org/Journals/index.php/DCS/article/view/4258>

This article examines how the use of ICTs has modernised tax administration procedures and improved revenue collection at the Large Taxpayer Department of Tanzania Revenue Authority. ICTs were introduced into the department in 2001 for facilitating maintenance and timely access of records and fast processing of return to remove postal delays, minimise operational costs, curb cheating and plug revenue loss. Large Taxpayers and Large Taxpayer Department staff (100%) agree that, since 2001 time for processing returns and responding to queries have been reasonably shortened. TRA reports reveal that actual revenue collection increased from TZS204,397.5 million in 2001/02 to TZS1,605,751.2 million in 2008/09 while revenue contribution share rose to 41% in 2008/09 from 23% in 2001/02. Although other

factors in the economy like increased internal trade, reduced importation and more reliance on home products may cause the increase, if there is no good tax administration, revenue will not be reflected in collections. The fact that revenue has increased proves that ICTs enhance tax administration.

Information and Communication Technology on Revenue Collection by Kenyan Counties

Githinji, Mwaniki and Kirwa. 2014.

International Journal of Academic Research in Business and Social Sciences November 2014, Vol. 4, No. 11

[http://hrmars.com/hrmars_papers/Information_and_Communication_Technology_\(ICT\)_on_Revenue_Collection_by_Kenyan_Counties.pdf](http://hrmars.com/hrmars_papers/Information_and_Communication_Technology_(ICT)_on_Revenue_Collection_by_Kenyan_Counties.pdf)

Tax revenue collection is relatively poor in most counties in Kenya; taxes have often not translated into improvements in public service delivery. The objective of this research is to identify the mode of strengthening domestic resource mobilisation by utilising ICTs. The study provides a review of information systems theories and examines the impact of management information system on revenue collection in Kenyan counties.

A Comparative Analysis of Tax Administration in Asia and the Pacific

Araki and Claus. 2014.

Asia Development Bank

<https://www.adb.org/sites/default/files/publication/41792/tax-administration-asia-pacific.pdf>

Although not explicitly focused on fighting corruption in tax administration, this report compares the administrative frameworks, functions, and performances of revenue bodies in 22 economies in Asia and the Pacific and provides useful information on the use of ICTs in these countries. ICTs offer electronic taxpayer services, which can significantly reduce administration costs and taxpayer compliance costs. Availability and penetration rates of electronic filing systems vary among jurisdictions and there are challenges to expand the usage of electronic filing in some countries because of the limited availability of internet access for individuals. Regarding tax payments, either internet banking or direct debit via bank accounts is available in 16 jurisdictions. Electronic tax payment methods in the form of either internet banking or direct debit via bank accounts is available in 16 jurisdictions and helps reduce tax administration costs and the scope for bribery and corruption, which is substantially higher with in-person payments at tax offices. Moreover, some revenue bodies (12 out of 22) have started to use social media platforms, such as Facebook,

Twitter and YouTube, to provide information and interact with taxpayers.

Human resource management

Effective information management systems can improve organisational efficiency and effectiveness of financial and operational administration. Although the literature does not usually explicitly investigate the impact of such systems on corruption, it is expected that such approaches can identify vulnerabilities and detect fraud, corruption and other malpractices in HR management processes and beyond. Effective pay management systems need to be in place to eliminate ghost workers or leakages of salary related financial flows. In Nigeria, payroll computerisation has been used to address widespread incidences of “ghost workers” and its impact on inflated wage bills. In Afghanistan, which is a cash-based economy, the Afghan National Police tested paying salaries via mobile phones instead of cash in 2009, using a text and interactive voice response system (Chêne 2015).

Corruption and Anti-Corruption Practices in Human Resource Management in the Public Sector

Chêne. 2015.

U4 Helpdesk Answer

http://www.transparency.org/files/content/corruptionqas/Corruption_and_anti-corruption_practices_in_human_resource_management_in_the_public_sector_2015.pdf

Although not specifically focused on e-governance, this Helpdesk answer provides a few examples of using ICTs for managing human resources in the public sector.

Human Resource Information Systems in Health Care: Protocol for a Systematic Review Human

Tursunbayeva, Pagliari, Bunduhi and Franco. 2015.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4704957/>

Compared with the e-health literature as a whole, there has been relatively little published research on the use and impact of ICTs designed to support business functions within health organisations. Human resource information systems (HRISs) have the potential to improve organisational efficiency and effectiveness by facilitating workforce planning, financial and operational administration, staff training and management analytics. However, the evidence base regarding HRIS in healthcare is widely distributed across

disciplinary boundaries and previous reviews have been somewhat limited in scope. This rigorous systematic review identifies, appraises, and synthesises existing international research on the implementation and impacts of HRIS in health organisations, to provide insights and recommendations that may guide future purchasers, commissioners, implementers, evaluators and users of such systems.

E-government as a Gateway to An Effective Public Human Resources Management

Rakotonirina and Raoelson. 2014.

Proceedings of the 8th International Conference on Theory and Practice of Electronic Governance
<http://dl.acm.org/citation.cfm?id=2691261>

The Malagasy government, particularly the Department of Civil Service (DCS) has been committed since 2005 to the computerisation of the HR management system through the integrated system of the public human resources management (SIGRHE). This study aims at providing a clearer vision of the e-government landscape in HR management. The expected results following the reform include: cleaning up the national file of the public personnel for better decision making, ensuring the payroll management control and improving the quality of public services provided to users. However, although efforts have been made, after almost 10 years of public administration computerisation, the new organisation has not yet halted the malfunctioning due to the lack of public personnel database and single file.

Social service delivery

ICTs also have a great potential in improving public service delivery by making services: more citizen-centric, soliciting citizen input to improve public services and tapping citizens to help deliver better services at a lower cost; raise the level of participation available to citizens in the processes of governing; and increase transparency and accountability in government agencies (Dupuy and Serrat 2014). More specifically, ICTs are also expected to reduce the need for citizens to interact with public services to access public services (Baniamin 2015), empowering the poor (Zinnbauer 2012) and providing feedback mechanisms to track satisfaction, identify problems and improve service quality (World Bank 2016). However, such approaches tend to be more effective in dealing with petty corruption than with grand corruption involving higher level officials, and their effectiveness depends on the nature and maturity of e-governance and the effectiveness of related

law enforcement efforts, among other factors (Baniamin 2015).

When Does ICT-Enabled Citizen Voice Lead to Government Responsiveness?

Peixoto and Fox. 2016.

World Development Report 2016

<http://pubdocs.worldbank.org/en/835741452530215528/WDR16-BP-When-Does-ICT-Enabled-Citizen-Voice-Peixoto-Fox.pdf>

This paper reviews evidence on the use of 23 ICT platforms in 17 countries that use citizen voice to improve public service delivery. This meta-analysis focuses on empirical studies of initiatives in the global South, highlighting both citizen uptake and the degree to which public service providers respond to ICT-enabled opportunities to express voice. The empirical evidence available so far about the degree to which voice can trigger institutional responsiveness indicates that user feedback to identify service delivery problems is not sufficient to leverage institutional response.

It has so far been most relevant where it increases the capacity of policy makers and senior managers to respond, but most dedicated ICT-enabled voice platforms have yet to influence their willingness. Where senior managers are already committed to using feedback to bolster their capacity to get agencies to respond, ICT platforms can make a big difference, making a technical contribution to a policy problem that to some degree has already been addressed.

ICTs Help Citizens Voice Concerns over Water – or Do They?

Welle, Williams and Pearce. 2016.

IDS Bulletin volume 47 Issue 1

<http://bulletin.ids.ac.uk/idsbo/article/view/35>

This paper investigates whether citizens who live in rural Africa, Asia or Latin America are able and willing to report on service delivery failures and whether service providers or government officials are willing to listen and respond to them, using an analysis of recent ICT reporting initiatives to improve rural water sustainability. The authors conclude that crowdsourcing may not be the most appropriate route to social accountability in rural water supply, that social accountability mechanisms are unlikely to address flaws in existing service delivery models, and that ICTs may be overrated as a “silver bullet” for increasing responsiveness and accountability in service delivery. The findings demonstrate that models where a service provider is committed to responsiveness and designs an in-house fault-reporting and maintenance system show greater

responsiveness and accountability to users than crowdsourcing models where users are encouraged to report faults.

ICT-Enabled Grievance Redressal in Central India: A Comparative Analysis

Marathe, O’Neill, Pain and Thies. 2016.

https://www.microsoft.com/en-us/research/wp-content/uploads/2016/06/ictd16_FINAL-1.pdf

Helping citizens to resolve grievances is an important part of many e-governance initiatives. This paper examines two contemporary initiatives that use ICTs to help citizens resolve grievances in central India: 1) a state-run call centre (the CM Helpline) and 2) an independent citizen-run journalism platform (CGNet Swara). Despite similarities in their goals, approach and geographical focus, the systems have key differences in their use of technology, their level of transparency and their relationship to government. The analysis suggests that both systems have important roles to play, the state-run initiative serving as the first point of contact for citizen grievances and information seeking, and the citizen-led initiative serving as a watchdog and avenue for escalation for longer-term grievances affecting a large number of people. The combination of both approaches has the potential to foster increased participation, transparency and accountability in governance.

Enabling Citizen-Driven Improvement of Public Services: Leveraging Technology to Strengthen Accountability in Nigerian Healthcare.

The World Bank. 2015.

http://reboot.org/wordpress/wp-content/uploads/2015/03/Enabling-Citizen-Driven-Improvement-of-Public-Services_2015.pdf

This report provides an overview of the Information and Communications Technology for Social Accountability (ICT4SA) project implemented in Nigeria. Piloted with the Nigeria States Health Investment Project (NSHIP) and provides an overview of planned further work. The project resulted in the development of the My Voice platform, which comprised of two integrated and mutually-reinforcing components: an open source technology platform and a programmatic model. Together, they enable My Voice to collect, manage and analyse citizen inputs, and to support governments in providing meaningful responses to citizen needs. The My Voice technology platform collects citizen feedback and presents it to service providers and policy makers in formats tailored for their specific needs, technical capabilities and

operational resources: an online dashboard, print reports or in-person meetings.

Mixed Incentives: Adopting ICT Innovations for Transparency, Accountability, and Anti-Corruption

Davies and Fumega. 2014.

Chr. Michelsen Institute (U4 Issue 2014:4) 38

<https://www.cmi.no/publications/5172-mixed-incentives>

Governments have different incentives for adopting anti-corruption-related ICTs, shaping the way new technologies are put into practice and the anti-corruption impacts they may have. Whether or not a particular ICT can bring anti-corruption benefits will depend upon the design of a specific implementation, the incentives driving its adoption, and the wider context in which it is applied. This paper maps a wide variety of ICT tools that have been implemented across the world including service automation, online services, and online corruption reporting, citizens reporting channels, online RTI requests, transparency and open data portals.

Controlling Corruption through E-Governance: Case Evidence from Bangladesh

Baniamin. 2015.

U4 Brief

<http://www.u4.no/publications/controlling-corruption-through-e-governance-case-evidence-from-bangladesh/>

This U4 Brief reflects on recent case evidence from the introduction of e-governance in Bangladesh, looking at the digitalisation of land services and the introduction of electronic and mobile ticketing in the Bangladesh Railway. While the of e-ticketing systems in the Bangladesh Railway has curtailed discretionary power among officials, corruption levels appear to have remained more or less the same even after the introduction of e-governance in land administration. This tends to indicate that the effectiveness of e-governance varies according to

its type and the nature of corruption, and tends to be more effective in dealing with petty corruption involving street-level bureaucrats than in dealing with grand corruption involving higher level officials. The author concludes that merely introducing e-governance is insufficient for controlling corruption. The nature and maturity of e-governance matters. Although e-governance can potentially improve monitoring of public services, whether it does depends on the effectiveness of related law enforcement efforts, among other factors.

3. Social media and ICTs for social mobilisation and citizen empowerment

While government processes can greatly benefit from new technologies, civil society can also use ICT-based interventions to mobilise and empower citizens and demand accountability. There is evidence of the key role social media can play in the fight against corruption, with internet and Facebook penetration having a causal, sizable and negative impact on corruption (Jha and Sarangi 2014).

Social media have a great potential for enabling quick mobilisation of a large number of participants for a particular cause, as demonstrated by the role it played in social movements in the Middle East or Ukraine (Bohdanova 2014; Comunello & Anzera 2012). This is made possible by the key benefits social media brings in terms of collaboration, participation, empowerment and time. As a collaborative and participatory media, it allows users to connect and form communities to socialise, share information, or to achieve a common goal or interest. By allowing internet users with the ability to inexpensively publish or broadcast information in real time, it opens new and democratic alternatives to the traditional media, opening new avenues for anti-corruption activists, as demonstrated by popular social media applications and platforms such as Wikileaks (www.wikileaks.org), ipaidabribe – Indian's corruption reporting platform – or a website created in 2009 by the National Democratic Institute to help users explore, analyse, and visualise the data associated with the 2009 Afghanistan presidential (Bertot et al. 2010).

However, the long-term sustainability of such collective mobilisation initiatives and ability to create long-lasting change is often a challenge. Social networks are built to create loose, decentralised networks, which due to their very nature, often lack a centralised leadership and clear lines of authority, which in turn can become real obstacles in reaching consensus, setting coherent goals and formulating a list of clear demands for the authorities (Bohdanova 2014).

Social Media and Corruption

Enikolopv, Petrova and Sonin. 2016.

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2153378

This article explores the potential of social media to promote accountability in non-democratic

countries, where offline media are often suppressed. The authors demonstrate that an anti-corruption blog can have a measurable, sizable impact on accountability, using anti-corruption blog posts by Alexei Navalny, a popular blogger and activist.

The paper demonstrates that his blogs have affected the stock performance of companies whose wrongdoings he has exposed. There is also indirect evidence that these blog posts were associated with an increase in accountability within state controlled companies he was writing about, resulting in higher management turnover and less minority shareholder conflicts. Taken together, these results suggest that social media can discipline corruption even in a country with limited political competition and heavily censored mass media.

Social Media, Internet and Corruption

Jha and Sarangi. 2014.

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2391904

Using data from over 150 countries, this paper explores the relationship between multi-way means of communication and corruption. Internet and social media platforms provide for two-way flow of information. Using Facebook as a proxy for social media, the authors show that Facebook penetration and corruption are negatively associated. The same holds for internet penetration. Both internet penetration and Facebook penetration have a causal, sizable and negative impact on corruption.

Unexpected Revolution: The Role of Social Media in Ukraine's Euromaidan Uprising

Bohdanova. 2014.

European View (2014) 13:133–142

http://www.academia.edu/17559473/Unexpected_Revolution_The_Role_of_Social_Media_in_Ukraine_s_Euromaidan_Uprising

This paper examines the role of social media in Ukraine's recent Euromaidan uprising and the strategic ways in which activists have used social media for protest mobilisation, internal and external communication and organising. It concludes by discussing the limits to the use of technology in Euromaidan as well as the particular challenges of online organising. The internet enabled activists to effectively communicate with each other, but also allowed them to communicate with a wider audience (including international observers) by amplifying their message through the mainstream media. Social media and other ICT tools were also used for crowdsourcing physical and creative

resources which proved crucial for sustaining Euromaidan over a long period of time. However, the authors note that the absence of leadership and clearly defined goals and demands are particular challenges faced by a majority of ICT-enabled collective actions.

Women, Social Protests and the New Media Activism in the Middle East and North Africa

Gheytanchi and Moghadam. 2014.

International Review of Modern Sociology, Volume 40 Number 1

This paper explores the diffusion of the use of new media technologies by women through the internal and external communicative practices of social movements and the effects upon women's roles as collective agents of social change. We examine women's media activism and their roles in the region's social upheavals, with a focus on four cases: Iran's Green Protests and its feminist movement; the 2011 political revolutions in Tunisia and Egypt, and women's campaigns since then; and the gradualist movement in Morocco for women's rights and democratisation. The authors show that women's cyberactivism, their citizen journalism, and their self-organisation both contribute to and reflect the social and political changes that have occurred in the region.

Will the Revolution Be Tweeted? A Conceptual Framework for Understanding the Social Media and the Arab Spring

Comunello & Anzera. 2012.

Islam and Christian-Muslim Relations, 23:4, 453-470

<http://dx.doi.org/10.1080/09596410.2012.712435>

This article analyses the main attempts to evaluate the "impact" of social media on the "Arab Spring" from specific perspectives, prioritising a nuanced picture of the "revolutionary" role of social media and its relationship with the Arab Spring. Social media played a key role during the Arab Spring for three reasons: 1) ICTs helped shape the political debates during the pre-revolutionary phase; 2) they helped mobilise people and connect and organise social groups who triggered street actions; 3) they helped to globally spread voices against regimes. However, while social media can be effective tools for training, recruitment and organisation, they are not strong enough to cause revolutions. Their effectiveness is also related to issues of fair accessibility for the populations. They can also be effective tools both for the rebels and for the repressive machine and can be used to monitor populations and to thwart protesters.

Social Media Use for News and Individuals' Social Capital, Civic Engagement and Political Participation

de Zuniga, Jung and Valenzuela. 2012.

Journal of Computer-Mediated Communication

https://www.researchgate.net/profile/Homero_Gil_De_Zuniga/publication/264668526_Social_Media_Use_for_News_and_Individuals%27_Social_Capital_Civic_Engagement_and_Political_Participation/links/55ae2f7e08ae98e661a55221.pdf?origin=publication_detail

Recently, scholars tested how digital media use for informational purposes contributes to fostering democratic processes and the creation of social capital. In the context of today's socially-networked-society and the rise of social media applications (i.e. Facebook), new perspectives need to be considered. Based on US national data, results show that after controlling for demographic variables, traditional media use offline and online, political constructs (knowledge and efficacy), and frequency and size of political discussion networks, seeking information via social network sites is a positive and significant predictor of people's social capital and civic and political participatory behaviours, online and offline.

Appendix: Types and examples of ICT innovation for anti-corruption

(Taken from "Mixed Incentives: Adopting ICT Innovations for Transparency, Accountability, and Anti-Corruption")

Focus	Innovation	Example
<p>Upward transparency</p> <p>Introducing ICTs into transactions with government</p>	<p>Service automation: Processes that replace discretionary decision making by public officials with auditable software processes. Often part of e-government reforms.</p> <p>Moving services online: Processes that remove intermediaries, giving citizens direct access to public services and information and reducing space for corrupt officials to extract bribes or rents.</p> <p>Online corruption reporting: Web or mobile platforms for reporting corruption or grievances to government. Reports and responses are generally not made public.</p> <p>Citizen reporting channels: Issue-reporting platforms that citizens can use to report problems with public services (e.g., potholes in roads) or to report corruption, often via mobile phone.</p>	<p>Bhoomi Project: This project in Karnataka state, India, was designed to reduce the discretion of civil servants. It has taken steps to digitise paper land records while also creating a software mechanism to control changes to the land registry in the district.</p> <p>National Rural Employment Guarantee: Following concerns that officials and politicians were inflating wage bills and appropriating wages destined for the rural poor labouring on public works, the government shifted to providing payslips and job cards digitally and making them available online.</p> <p>Odisha e-grievance portal: The government of Odisha state, India, created the Sanjog Helpline in 2008. The system facilitates online transfer of citizen grievances to the relevant departments. Officials and citizens can monitor progress on the complaints through a ticket number provided to them.</p> <p>Fix My Street: This website allows citizens to report issues on a map and routes requests to the right government agency. A public log of issues is available so that citizens can see whether government is fixing problems or not. This British initiative has been replicated in many countries around the world, including Australia, Canada, Cyprus, Georgia, Germany, the Republic of Korea, Netherlands, New Zealand, Greece, Japan, Sweden and Tunisia, among others.</p> <p>I Paid a Bribe: This website invites citizens to report corruption via mobile phone or the web and displays information on corruption trends. Reports are sent directly to government but are made transparent.</p>

Focus	Innovation	Example
<p data-bbox="57 987 213 1055">Downward transparency</p> <p data-bbox="57 1084 309 1218">Using ICTs to get information on government in the public sphere</p>	<p data-bbox="333 367 785 667">Online RTI requests: Online platforms that allow users to file right to information (RTI) requests digitally. In some cases, government agencies create these platforms, but in other cases, civil society organisations build them, mostly in the absence of an official website. They also republish the official responses.</p> <p data-bbox="333 801 785 969">Transparency portals: Websites that offer timely publication of key government documents online. They are often focused on financial information and can be backed by legal mandate.</p> <p data-bbox="333 1503 785 1704">Open data portals: Portals that provide free access to a wide range of government datasets in machine-readable formats. The intention is to enable third parties to scrutinise the data and build applications on top of it.</p>	<p data-bbox="807 367 1457 501">What Do They Know: This website was created by mySociety, a civil society organisation. It allows users to file freedom of information requests via the web to government departments and public authorities in the UK.</p> <p data-bbox="807 533 1457 763">Infomex: This website allows users to send information requests to the Mexican federal government. It also allows users to appeal agency decisions through the oversight body, the Federal Institute for Access to Public Information (IFAI). The website was created by the Mexican government after the enactment of the Mexican access to information law.</p> <p data-bbox="807 801 1457 1137">Peru transparency portal: The Peruvian government implemented a comprehensive transparency strategy in early 2000. It comprised several initiatives including a law on access to financial information, promotion of citizen involvement in transparency processes and the launch of a financial transparency portal. At first, the portal provided access to documents on economic and financial information. After more than a decade, it currently published datasets on several economic and financial topics, which are provided by each of the agencies in charge of collecting the information.</p> <p data-bbox="807 1173 1457 1435">Brazil transparency portal: Created in 2004, this portal allows users to follow up on the financial execution of all programmes and actions of the Brazilian federal government. It provides information on funds transferred by the federal government to state municipalities and the federal district; funds directly transferred to citizens; and direct spending of the federal government on procurement or contracts for projects and services, among other things.</p> <p data-bbox="807 1471 1457 1606">US open data portal: Launched in 2009 to bring together datasets from across government, the Data.gov portal now catalogues over 90,000 datasets from more than 220 departments and agencies of the US government.</p> <p data-bbox="807 1641 1457 1904">Kenya open data portal: This portal was launched in 2011 following the template of open data initiatives in the United States, the United Kingdom and elsewhere. It provides access to a range of government datasets in machine-readable formats as well as applications that third parties have built with this data. A number of initiatives to encourage media and entrepreneurs to use data from the portal have taken place.</p>