

Effects of Information Communication and Technology (ICT) on Corruption and Social Capital

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Abstract: *This research paper examines the argument that Information Communication and Technology (ICT) and social capital serve as major factors to reduce corruption. ICT has the potential to reduce unnecessary human intervention in government work processes, thus reducing the need to monitor corrupt behavior. Furthermore, citizens living in a society with a high level of social capital are more likely to become actively involved in the political decision-making process, increasing the likelihood that public employees' corrupt behaviors will be exposed to the densely connected public. We also examined the relationship between social capital and ICT. Our statistical analysis, which used panels of datasets obtained from various sources, revealed that (1) ICT is an effective tool for reducing corruption; (2) social capital also has positive effects on anti-corruption, but various dimensions of social capital may have different impacts; and (3) the relationship between social capital and ICT is inconclusive. Points for practitioners The theoretical model and empirical results of this research paper shed light on the potential impacts of ICT on corruption, thereby providing practitioners with the opportunity to consider ICT as a useful and practical policy tool for reducing corruption in addition to traditional methods, i.e. administrative reform and law enforcement. Further, although our research findings on the relationship between ICT and social capital were inconclusive, social capital was found to have anticorruption effects independent of ICT, which implies that policies designed to foster trust networks in a society can contribute to the reduction of corruption.*

Keywords: ICT, Anticorruption, Human Intervention, Policies

1. Introduction

Increasing transparency and fighting corruption through ICT is a fundamental component of a functioning democracy. UN Special Rapporteur, Frank La Rue, highlighted the importance of ICT for development by stating (2010:7): "Access to means of communication and, in particular, to electronic communications is now seen as necessary for achieving development and, therefore, should also be considered as an economic and social right. Governments should take responsibility for facilitating and subsidizing access to electronic media to ensure equitable enjoyment of this right, to combat poverty and to achieve their development goals".

2. An Empowered Citizenry – The Best Way to Fight Corruption

Corruption is a function of both the opportunity to request/receive bribes and the risk of detection. Corruption exists in all sectors of society. It damages a country's development by undermining faith in public institutions, increase costs for firms and discourage both foreign and domestic investments. According to Transparency International's 2009 report corruption is a growing challenge for the business sector both in the developing and industrialized countries. At the level of the individual firm, it raises transaction costs and introduces reputational risks, as well as opens up for extortion. Regardless of sector and level of transactions, corruption hampers development. Corruption falls disproportionately on the poorer members

of society and hinders them from accessing scarce services. Civil society organizations in developing countries are demanding greater transparency as a key component in fighting corruption and empowering people living in poverty. Increased transparency is often dependent on political will, and civil society around the world is actively challenging their governments to open up systems to public scrutiny. When governments do not have the capacity and/or the will to launch administrative reforms to remove the opportunities for corruption, adding external pressure on officials by increasing the risk of exposure might be a workable alternative. External pressure involves both a revitalization of mass media and empowerment of private citizens.

- ICT can improve transparency in the public sector by increasing the coordination, dissemination and administrative capacity of the public sectors", as well as improve service delivery by employing user-friendly administrative systems.
- ICT facilitates the collection of digital footprints and complete audit trail which increase the opportunity to hold individuals accountable and ultimately increase the possibility to detect corrupt practices.
- ICT can facilitate the work of civil society organization working towards greater transparency and against corruption by supporting a mix of methods of campaigning on transparency and educating citizens on what corruption is about and their civil rights.
- ICT can facilitate information sharing and social mobilization and ultimately provide digital platforms where citizens can report incidents anonymously.

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3. Increasing Transparency and Fighting Corruption through ICT

It shows that ICT - interventions need to be launched together with real administrative reforms in order to be successful. Together with comprehensive administrative reforms ICT can decrease corruption by increasing transparency, introduce systemic hurdles, as well as increase the risk of detection. Rebekah Heacock and David Sasaki explored the concept of ICT as a means to increase transparency in Sub-Saharan Africa in depth and highlight the growing potential by analysing a number of East African initiatives. The authors argue that while there is resistance among some governments, there are parallel to that both strong visionaries and a growing body of tech-savvy citizens willing and able to challenge that resistance. The authors also highlight the need for donors to acknowledge their part in aiding non-transparent practices and call for greater aid transparency. Lack of transparency within international development cooperation ultimately makes it difficult for citizens to hold their own governments accountable. There are still significant challenges in realizing the potential of new technologies due to issues of access. The Internet is providing over a billion people with unprecedented access to information and communication tools, but the vast majority of the world's citizens have no or limited access to the Internet. PhD Candidate, Johan Hailstorm, challenges the access argument by highlighting the explosion of mobile phone access and use in his chapter „Mobile technology as a means to fight corruption in East Africa“. In Eastern Africa there are 50 million mobile subscribers and people spend almost 50% of their disposable income on mobile communication. Hellström argues that if mobile interventions can develop beyond the pilot-study-syndrome and find solutions to privacy concerns, and develop sustainable business models; then “mobile solutions give citizens a voice, bigger ears and hopefully, a chance to mobilize and act upon the information”. The first three chapters all touch upon a crucial point – the realization of ICTs potential is dependent on the surrounding political, social, economical and infrastructural environment. These factors will in part decide if the technology can be used to its fullest potential. ICT will thus remain unrealized in some contexts due to efforts by governments to control it. In a recent report of the UN Special Rapporteur, Frank La Rue, on the promotion and protection of the right to freedom of opinion and expression (2010, A/HRC/14/23), this development is noted with concern. Moreover, the Rapporteur highlights the following phenomena of particular concern:-

- 1) The fragmentation of the Internet through the imposition of firewalls and filters, as well as through registration requirements;
- 2) State interventions, such as blocking of websites and web domains which give access to user-generated content or social networking, justified on social, historical or political grounds;
- 3) The fact that some corporations which provide Internet searching, access, chat, publishing or other services fail to make a sufficient effort to respect the rights of those who use their services to access the Internet without interference, for example on political grounds. This may serve as a real deterrent as well as a monitoring tool.

Such systems can, to some extent, assist in tracking anomalies in operations, in observing systematic features of customers' reporting about errors or misuse, and in social media analysis (Gilliatt, 2007). This paper investigates the current state of the art by discussing the following questions:

- What is corruption?
- How is ICT supposed to help reducing corruption?
- What is the evidence of ICT's role so far?

Based on the findings the paper concludes by discussing various proposals for ways forward.

4. What is Corruption?

As noted above, Transparency International (TI) defines corruption as the abuse of entrusted power by political leaders or a bureaucracy for personal gain or specific group interest. The UN points out that corruption can take many forms that vary in degree, from the minor use of influence to institutionalized bribery, and that “this can mean not only financial gain but also non-financial advantages” (UN, 2010). In this context it should also be noted that it can take place in both online and offline environments, and that even if it takes place offline – which no doubt most corruption does – it may leave traces online such as interpersonal communications, money transfer, and indeed the opposite – lack of transactions. Further, wherever corruption takes place, one locus for combating it is online, as the Internet is increasingly the forum for achieving transparency, awareness raising and debate. Defining corruption is one thing, measuring it is a different matter. Being an undercover activity, corruption usually leaves no direct trails in paper or computerized records. Hence, information needs to be collected by other means. One of these is engaging the public: “Responses about corruption based on individuals' actual experiences are sometimes the best available, and the only, information we have” (Kaufmann, Kraay and Mastruzzi, 2006). The public can be enlisted in several ways. At the micro level – projects and specific service processes – there are guidelines for what is allowed and what is not, how to detect corruption, and how to prevent it, e.g., by managing projects meticulously (e.g. UNDP, 2004; Olsen, 2010). At the macro level (national) there are several indices developed for corruption measurement (UN, 2008). Two commonly used ones are TI's Corruption Perceptions Index (CPI) and the World Bank's Corruption Control Index (CCI). Measuring corruption is inherently difficult as it is largely an undocumented activity. Therefore, what is measured by the various indices is largely a number of proxy variables. CPI measures the level of corruption in countries based on experts' perceptions. CPI focuses on petty corruption, bribery in government services-to-citizens operations. It uses data from fourteen sources from twelve independent institutions. All sources measure the overall extent of corruption (frequency and/or size of bribes) in the public and political sectors and all sources provide a ranking of countries (UN, 2008). The CCI is used for annual evaluations as well as being a measure used in research (Kaufmann et al., 2003; Lindstedt, 2005:22f). Compared to the CPI, the CCI draws on more data as it comprises 195 countries and also includes data collected from citizens (Kaufmann et al., 2007:75). Focusing on larger-scale corruption, the Bribe-Payers' Index by TI ranks 30 leading

exporting countries according to the propensity of firms headquartered in those countries to bribe when operating abroad. This is an indirect measure of the soil for corruption in a country. More direct measures include the World Bank CPIA (Country Policy and Institutional Assessment) index which measures the quality of policy and institutional environments by a large set of criteria, including the regulatory environment, policy and institutions, rule-based governments and more (UN, 2008; World Bank, 2010b). The Global Integrity Index (Global Integrity, 2006) measures corruption in terms of its opposite, i.e., factors that contribute to reducing corruption; the existence, effectiveness of, and the citizen access to key anti-corruption mechanisms at the national level in a country. Like the CPIA it measures institutions rather than corruption per se. This brief and certainly not complete review has been pursued to make the point that there are many different indices with different foci; petty as well as large-scale corruption, micro (project) as well as macro (national) level, symptomatic (measuring corruption-related activities) or systemic (measuring the quality of institutions). Measuring is important for understanding, but even though measurement is incomplete there is at least a certain level of understanding of a number of factors that in different ways entail, facilitate, or fail to prevent corruption. There is a need to take some action. This is where ICT comes in; how can it address at least some of the factors known to be conducive to corruption? Beyond the definition of terms, several studies have attempted to unravel what causes corruption. A commonly used causal model, first introduced by Robert Klitgaard (1998), proposes that it is a problem of asymmetric information and incentives. Klitgaard draws on the commonly used principal-agent-client model; each actor can have different interests and the agent is under some circumstances both empowered and inclined to act for his own purposes rather than those of his principal and his principal's client. Klitgaard claims that corruption occurs when a public official can operate in a situation of information monopoly, can administer an operation in discretion, and a lack of accountability. The formula reads, $\text{Corruption} = \text{Monopoly} + \text{Discretion} - \text{Accountability}$. Transparency International (TI) adds a community factor, called ethical ambience, to the equation. This refers to "the sense of community, of responsibility for the common good and of ethics" (Moor, 1998). The ensuing extended TI definition reads $\text{Corruption} = (\text{Monopoly} + \text{Discretion} - \text{Accountability}) / \text{Ethical ambience}$ (TI, 2004:14). The obvious, however difficult, ambition then includes to dismantle monopolies, avoid discretion, and increase accountability and the positive ethical ambience. Here, ICT stands out as a useful tool as it can address at least some of these factors.

5. Theory – How Can ICT Help?

Monopolies and discretion are corruption facilitators, while accountability and an anti-corruption ethical ambience in communities are inhibiting factors. There are several ways in which ICT can contribute positively to changes regarding these factors.

Monopolies

The process of constructing electronic services entails transferring information held by government agencies, or individual civil servants, into electronic platforms and presenting it to users in forms defined by laws and process regulations by means of linking different databases. Because this is done automatically there is no room for individuals to exert influence by manipulating or withholding information as long as the user has direct access to the electronic service; automation removes the agent. Using electronic services also means introducing competition by providing alternative delivery channels. This way users can choose to avoid agents who are corrupt (Bhatnagar, 2001). However, there may still be local monopolies in providing the e-services, for example in telecentres or e-kiosks, and there are services where there are "natural monopolies", such as tax administration and customs; two sectors from which incidentally there are typically reports of high risk for bribery and for which e-services are claimed to be most beneficial. Dismantling of monopolies (governmental or outsourced) requires administrative reform (Bhatnagar, 2001a; Hanna, 2004). Rumel (2004) claims that, to be effective, such reforms require at least a minimum of democratic governance. Kettl (2000:33) states that "Experience demonstrates quite clearly that tactics such as outsourcing, customer service, and information technology do not – and cannot – manage themselves. Indeed, they require aggressive and thoughtful oversight." It has been suggested that ICT is no substitute for poor management.

While obviously management matters, the very process of building an on-line delivery system requires that rules and procedures are standardized across regions and made explicit so as to make them amenable for coding which reduces the discretion on part of civil servants and increases the auditability of operations (Bhatnagar, 2001a; Lau, 2001). This means that eGovernment itself can be used as a starting point for reengineering processes and making them less corruption prone.

Discretion

The very idea of electronic services is that the user interacts with an electronic system where rules are strictly specified, rather than with a civil servant. While the main reason for electronic services is typically related to cost savings, clearly automation removes the possibility of the civil servant acting on his or her personal discretion. Rumel (2004) calls this process of taking the agent out of the principal-agent model "disintermediation", which means that the client interacts directly with the principal by means of the rules implemented in the IT system; strictly, so that the computer follows rules without discretion. Wherever the user has direct access to an electronic service, the opportunity for the civil servant at the particular point of computerization to refuse a service unless paid personally is removed. However, it may shift the exercise of discretion to other places in the service process. First, there may still be some person guarding access, in particular when clients are illiterate or do not have access to a computer and hence may not be able to use the service directly themselves. Provision of services at telecenters may serve as at least a partial safeguard against

this risk, as in such settings there are many people around serving as witnesses which provides openness to the situation, which in itself is a barrier towards corruption. Second, even though the front end of a service is computerized, there may be manual handling in the back office where civil servants may find room for discretion. Finally, there may be discretion involved in implementing and maintaining the computer systems (Reddick, 2005). Computerization projects as well as outsourcing service contracts may be targets for bribes. Some claim that this way ICT may even provide an opportunity for more corruption (Heeks, 1998).

Accountability

Accountability refers to the “service guarantee” of a government; the extent to which its actions are accounted for and corrected if not carried out correctly in the first instance. Technically, accountability can be improved fairly easily. Information can be published online, processes and decisions can be traced for audit and analysis, and there can be rules for compensation where accountability is not delivered. For this to happen, however, there is a need for a set of firm laws regarding government procedures in general and how they should be handled in the IT medium in particular. In recent years all countries have needed to update their laws to cater for accountability in electronic services, but comprehensive and effective legislation is not yet at hand in many countries. It requires openness of processes, access by the public, transparency of rules, processes for complaints handling, etc. There are studies showing that the greater the access to information, the lower the corruption levels (DiRienzo et al., 2007).

Community/Ethical ambience

Many international organizations provide “anti-corruption toolkits”, both general ones and those targeted towards different audiences, such as politicians, local communities, local government, project managers, youth, specific countries or regions, businesses, etc. The toolkits are overall similar in content. They include codes of ethics for professionals, conflict of interests laws, whistleblower protection, ethics training, etc. Examples include the UNESCO UN Anti-Corruption Tool Kit (UNESCO, 2007), Transparency International’s anti-corruption education (TI, 2010), the World Bank resource centre (World Bank, 2007), and the anti-corruption toolkit at the website: anticorruption.org (2000). Over the past few years ICT has become increasingly important in this field due to the phenomenon of the “social web”. Organizations increasingly try to use various online forums to promote ethical behaviour.

CT tools for corruption combat

There are numerous ICT tools that can be used during various phases of combating corruption, including prevention, detection, analysis, and corrective action. Anti-corruption software is a label used for various tools designed specifically for detecting and taking action against fraud, including both “intelligent mining” of data sets and administrative procedures. The origin of the tools can be

traced to methods used for intelligence and police work. For example, the “Pursuit” software from Distillery Software (http://www.distillerysoftware.com/industries/anti_corruption.html) contains tools for intelligence “allowing investigators to capture rich entity and association data and build up a picture of relationships between persons of interest, assets, events and organizations”, complaints management and investigation management. Complaints and investigations management are basically administrative tools facilitating various procedures involved, such as “Witness and Exhibit Management” (management of structured and unstructured data), “Brief of Evidence/Case File Production” (produces court documents automatically as output from the other tools), and “Asset Tracking” (linking to individuals and organisations, and tracking actions in relations to those assets). These are tools focusing mainly on systematic and/or large-stake corruption and they operate only in the electronic world so things that take place exclusively in the physical world escape attention. However, small-stake corruption can also be traced this way. For example, one of the effects of even petty corruption is that civil servants own more expensive property than they can reasonably afford given their official salary, and asset tracking is one way of systematically finding this out. Another way to do this is, of course, by coordinating existing government records of people and properties, if such exist sufficiently. Such software is reportedly used by the Kenya Anti-Corruption Commission (Kenya Anti-Corruption Commission, 2010), but similar software functionality, developed in-house or off-the-shelf, is used also in other countries – and for other purposes, which is a particular point of concern. No doubt corruption fighting is important, but monitoring people’s actions may also conflict with human rights and privacy legislation (in countries where such exist) and concerns (in all countries). The tools can be used to trace not just corruption but also terrorism, refugee communities, and any activity, not just illegal ones. Social Network Analysis (SNA) software are general tools to analyze communication patterns on the Internet. While some of the functions are similar to anti-corruption software this group of tools has an entirely different background. They stem from market research and most aim to provide companies with tools to chart, understand, and communicate strategically with their customers. The underlying “intelligence” in the systems comes basically from two strands of research; social network analysis and linguistics. Social network analysis techniques can detect various characteristics of networks, in this case of people communicating on the Internet. Examples of such analyses include (but are not limited to) detection of cohesive subgroups (cliques, clans) and regions (components, cores), centrality analysis, network density, distances, detection of structural holes. These are technical terms describing network composition, which in simple terms basically identify who is the leader of a group, who are his/her executives/closest associates, and who are the followers. If this information is coupled to other information, historical as well as present, about specific people, such as their assets or their relation to companies that take part in public procurement processes where corruption may occur, it is possible to trace not just illegal actions but also preparations for such, in particular when combined with the use of linguistic tools. Beyond the available commercial software there is also the obvious

option for any country to invest in in-house development and build proprietary software that contains functionality designed to help fight corruption in ways specifically designed to meet local conditions.

Two examples are found in India and Russia:

In India, the National Rural Employment Guarantee Act (NREGA) guarantees wage employment to every household whose adult members volunteer to work on labour-intensive public works annually. The system is administered in a way that even its proponents admit holds ample opportunity for corruption and further exploitation of the rural poor it intends to serve. An investigation has found that officials and politicians inflate work bills, fake wages and pocket funds. To bypass the human agents involved in the administrative process, computers, not officials, now issue job cards, provide work estimates, and generate each worker's pay slip online (at www.nrega.ap.gov.in). Payments are made into individual postal accounts created for the purpose. Reportedly this technologically uncomplicated measure has so far recovered a substantial amount of misappropriated funds (Srivastava, 2008). In Russia, an attempt to fight corruption in government procurement by including automatic checks in the process was announced as "Dmitry Medvedev's Anti-Corruption Software. President Puts the Fight against the Main Evil into Automatic Mode" (Sergeev, 2008). The official website of governmental procurements will automatically detect signs of corruption in the bids submitted by government agencies and state-owned enterprises. The Federal Antimonopoly Service will be notified automatically of improperly composed bids. Checks include various formalities as well as loopholes created in translation between Cyrillic and Latin alphabets. Reportedly the software detected 190 bids with suspicious distortions in a single week. However, many believe that information control over governmental procurements will be ineffective as subsequent extortion will remain. "In the late 90s [the] share of kickbacks in public procurement was estimated at 10–15%, but today – despite the use of Internet technologies – it has grown significantly" (ibid).

6. How has ICT Performed in Reducing Corruption in Practice?

The effects of ICT/electronic services/electronic government and community on corruption have been studied at micro (project) level as well as macro (national) level.

Macro level studies (nations):

Andersen (2009) estimated the impact of E-Government on corruption using the changes in the CCI index from 1996 to 2006 and found that different countries' E-Government maturity development (as measured by the index of West et al. (2006) was reflected in positive change of CCI, and quite strongly so. When a country implements more E-Government there follows a considerable reduction in corruption. Andersen also tested the effect of the variables of GDP per capita and the degree of "free press". The study found that the growth rate of GDP per capita is always significant, whereas a free press did not seem to influence changes in corruption. Shim and Eom (2009) examined how

the two factors social capital (the strength of positive social relations) and ICT affected corruption and found that both factors individually had positive effects on corruption. Shim and Eom measured corruption by the TI Corruption Perception Index (CPI). ICT was measured by three factors, (i) the UN E-Government readiness index, (ii) the UN e-participation index, and (iii) internet penetration. The measure used for social capital was the World Value Survey (WVS), an international research project that measures the values held by people from around the world. ICT had positive effects on corruption, and social capital had anticorruption effects independently of ICT. The authors conclude that "policies designed to foster trust networks in a society can contribute to the reduction of corruption". As for the impact of ICT on corruption, e-readiness and e-participation were significant. Controlling for bureaucratic quality, rule of law, anti-favoritism, and competence of government officials, the ICT variables were still statistically significant. They found that the three ICT variables accounted for 77 % of the total variation of corruption, which means that ICT variables had a substantial effect. In fact, ICT variables were more influential in terms of reducing corruption than traditional anti-corruption factors. The authors conclude that "in addition to the traditional anti-corruption approaches, i.e. administrative reform and law enforcement, ICT could be an effective tool in reducing corruption". These studies combined suggest that the often stated assertion that administrative reform must come first and ICT only later does not hold true. ICT reform also drives administrative reform. ICT can hence be a good place to start.

Micro level studies (projects):

Many studies of ICT in developing countries concern India, as that country has invested massively in various electronic services from government as well as distribution systems such as kiosks, "eSevas" and telecentres. Two major projects which have been much studied both for their ambition and outcome and for their particular focus on curtailing corruption are Bhoomi and CARD. They are interesting because although similar in design the outcome turned out very differently.

Bhoomi:

The Bhoomi project was initiated in Karnataka by the Department of Revenue (DoR). The project was designed to facilitate online delivery of land records so that citizens could challenge arbitrary bureaucratic action if they deemed them to be unfair. It was also designed to automate the internal government processes to remove discretion from civil servants (Chawla and Bhatnagar, 2001). In terms of the size of its operation, the project has been successful. Since inception the project has computerized 20 million records for 6.7 million farmers. Before the implementation of Bhoomi, farmers were required to seek assistance from the Village Accountants (VAs) in order to obtain a copy of their "Records of Rights, Tenancy of Crops" (RTCs). These documents are requisite for farmers to apply for bank loans (Bhatnagar, 2002). Traditionally, the time taken to obtain RTCs ranged from 3 to 30 days depending on the type of document and where it was obtained. If farmers decided to purchase or sell farm land, mutation requests were to be filed with the help of VAs. The VA posted the information

at the local office for interested parties. If there were no objections within 30 days, land records were updated in the presence of the revenue inspector (RI). The VAs were also collecting bribes and forwarding them up the bureaucracy. The amount of bribes depended on the importance of the documents. A typical bribe in 2002 ranged from US\$2 to US\$40 (Bhatnagar, 2002:26). The Bhoomi project was hence in practice “dis intermediating” the service (Rumel, 2004). Automating the mutation requests removed the citizens’ need to deal with VAs, which was also the point of corruption in the previous system. Nine thousand VAs were replaced or bypassed because farmers could now obtain a printed copy of the RTC at 800 kiosks (in 2009) in Karnataka as well as check the status of their mutation request. The operators of the information system had to log in via thumb print authentication which eliminates the possibility of password fraud. This measure was designed to avoid discrepancies so that the corrupt behaviour could be detected easily.

Although the central role of the VAs was replaced by computers, the role of the RIs, another point of corruption, still remained as before (Bhatnagar, 2003). A World Bank evaluation report concludes that “Corruption and harassment in some government practices have decreased a bit. Most people perceive a lowering of corruption and less harassment, at least for some of the public services that are available through Gyandoot like income/caste/domicile certificates. The impact is minimal, but people feel that something is changing” (Arazyan, 2002). The project has taken measures to increase government accountability by installing a system of electronic grievances, and the handling of these is followed up to see if they are responded to. However, the system still has holes in the verification chain, as the Bhoomi is not connected electronically to the Registration Department: “Village accountants working in the field are apparently still getting bribes for work on mutations” (Arazyan, 2002). Some studies have claimed that Bhoomi reduced corruption from 66 % to less than 3 % (Pathank and Prasad, 2006; Bhatnagar, 2003). A 2006 study suggest the reduction is from 29.7 % to 0.8 % for RTCs and from 33.8 % to 0.7 % for mutations (Bhatnagar, 2009). While all these numbers appear impressive they also point to the difficulty of measuring corruption. Input data is people’s self-reported frequency of paying bribes. This data may not be accurate as people may have forgotten with the lapse of time, possibly years, since they used the manual services, which probably is one explanation for the great variation in the “before” numbers between the different studies (ranging from 30 % to 66 %), and which means that the “after” numbers should also be used with caution. According to Bhatnagar (Personal communication via email, 9 May 2010), the sample and sampling methodology was also more rigorous in the recent studies as compared to the earlier 2002 study. While evaluations are not conclusive it seems clear that the Bhoomi project has had considerable success in addressing the Discretion and Accountability parts of the corruption equation ($C=(M+D-A)/E$). However, there are still loopholes, and without tender care, local monopolies will be created or sustained. “There is no substitute for good management” (Bhatnagar, 2003).

CARD

The Computer-aided Administration of Registration Department (CARD), is a property registration system implemented in the state of Andhra Pradesh (AP) by the Registration Department (RD). The goal was to increase transparency and efficiency in the land registration process and ultimately reduce corruption. CARD assists officials in the sub-registrar office (SROs) complete the property registration procedure. The registration process consists of four steps; purchasing paper bearing an official stamp, establishing price of the property, determination of the applicable duty, and recording of the details of the transaction (Prakash and De, 2007). Before the introduction of CARD, the RD was severely corruption-ridden. The staff at the entry point of the registration process (printing and filling out forms) demanded bribes before the registration forms could be moved through the process. Once the forms were processed at the entry point, mid- and senior level staff with authority to complete registration and other services could demand bribes at any point. The CARD system can be used to assess property value, enter data and prepare sale deeds. The system allows searching for encumbrance, certification, and certified copies of documents. The system registers 1.18 million documents per year and serves 5 million citizens. Although some portion of the registration process was computerized, the registration process could not be automated because existing laws such as the 1899 Stamp Act and the 1908 Registration Act were not adopted for the effectiveness of the CARD. However, several other statutes were amended, mainly to recognize digital records and computer printouts as legal documents. Although paper forms were replaced with computer printouts and the paper records were changed to digital format, the officials still enjoy a monopoly over printing stamped papers (using computers), revenue collection, and stamp duties. Even though the registration was partly computerized, nothing changed for citizens because they were still required to bribe from the starting point of the registration process all the way until the registration was completed. “Even though the CARD was designed to reduce corruption, the civil servants did not allow its functionality to be integrated because of heavy resistance from the corrupt officials” (Caseley, 2004). The project did not meet the original objective of reducing corruption because the project did not have support from the department head or politicians (Caseley, 2004). However, the project has improved the possibility for inspection. With CARD, civil servants have information at their fingertips and can search for information very quickly (De, 2007:5). The Bhoomi project was designed to combat corruption and it was implemented effectively. The department head was able to deliver strong leadership and acquire political support. In the case of CARD, leadership was less successful. Although some literature suggests CARD was able to eliminate middlemen and organized corruption, thus reducing corruption by 90% (Pathak and Prasad, 2006), there is other evidence. Bhatnagar (2009) reports that the practice of bribing was only reduced marginally, from 28 % to 24 %. Given the uncertainty in the data used, this reduction is hardly significant. It should be noted that CARD has been evaluated positively by other measures, mainly by reducing waiting and travelling times for citizens (Bhatnagar, 2007). From the examples of Bhoomi and CARD one can

conclude that management matters, and greatly so. It is typically assumed that implementation of e-government systems minimizes corruption in developing countries. However, as Dé (2007) finds, the existing conditions in which e-government systems are introduced as well as the inherent design of the systems will determine their effect on corruption, something of which the Bhoomi and CARD cases are evidence. eGovernment systems must increase access to information, ensure that rules are transparent and that they are applied in specific decisions, and build the ability to trace decisions/actions to individual civil servants (Bhatnagar, 2002). When all these objectives are pursued at the same time, corruption can be reduced significantly, but ignoring some of them can defeat the purpose altogether. Combatting corruption requires administrative reform; it is not a straightforward ICT matter. Corruption is rooted in the cultural, political, and economic circumstances of those involved. ICT does little to affect these root causes. At the national level, one needs political will, ethical watchdog agencies, proper incentives for honest officials, and effective punishment for corrupt ones (Quah, 1999). Bhoomi succeeded impressively, even interpreting the evaluations conservatively; CARD did not.

7. Discussion and Conclusion

Although there is a scarcity of reliable data, there is at least some evidence that ICT can be an effective tool to combat corruption. The potential of ICT can, however, only be realized when it is combined with real administrative reforms. One of the positive findings is that ICT also drives such reform. The article has studied corruption at two distinct levels, national and project/process. Regarding the national level, three findings have been presented.

- More eGovernment is better; the more services online in a country, the less corruption. The effect is considerable (Andersen, 2009).
- ICT has a greater positive effect than the traditional anti-corruption factors (e.g. administrative reform without the development of technological support systems, free press) (Shim and Eom, 2009; Andersen, 2009).
- Increased social capital (stronger social bonds) reduces corruption (Shim and Eom, 2009).
- This means that even though clearly several individual projects are not successful, the overall balance is positive – ICT investment in eGovernment pays off in terms of reduced corruption. One possible limitation in these studies is their dependency on the quality of the indices used. More research is needed to investigate how robust these measurements are across different indices. At the project level there are a number of factors determining what makes projects succeed or fail from a corruption perspective.
- Management matters. A major difference between the Bhoomi and CARD projects is the different leadership and their focus on corruption reduction.
- Administrative reform must focus on whole systems, not just individual functions. Wherever there is a loophole due to some technical component missing there is an opening for corruption. This was seen in failed projects as well as in successful ones. The latter had fewer loopholes because of a more systematic design (e.g. Bhoomi).

- Corruption is an economic activity. When bribes are cheaper than fees there is a market for corruption, when fees are lower than bribes there are good chances of reducing it, as was shown in the Bhoomi case.
- Political support makes a difference. It contributed to the success of Bhoomi, and the lack of it contributed to the failure of CARD (regarding the corruption effect).
- Creating an “ethical ambience” among the public requires trustworthy reporting systems and prompt corrective action from government.

This paper has shown that ICT can indeed bring a positive difference but only in combination with skilful and determined use. Beyond the specific findings listed above, there are developments that are still in their infancy and require more research. Advanced tools for “social network analysis” are potentially very useful but these tools require a considerable amount of skill and care in use so as to avoid over interpretation and the pursuit of innocent people, hence violating human rights with all its consequences not just for individuals but also for states and companies. So far these tools have mainly been used for national intelligence, and the migration into more “civil” activities is not straightforward. More research is needed not just on how these tools can be effectively used but also how they can be ethically used. The use of “social software” or “web 2.0 tools” to promote ethical attitudes requires considerable human resources. There is also a question as to just how much government itself should engage in such activities, for reasons of credibility as well as of resources and policy. There is as yet no clear answer to this question as the role of government in social media is currently at an experimental stage.

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