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IT and Government Corruption in Developing Countries: A Literature Review and Reframing

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Abstract. Corruption is a significant challenge confronting government administration in developing countries with adverse implications for information technologies implemented to stamp it out. ICT4D, information systems and related studies of government corruption continue to shed light on the phenomena but have an undertheorized view of corruption, its relationship with IT, as well as the role of IT in curbing corruption. Research underemphasizes the socially embedded nature of corruption by treating corruption as a problem of individuals who act corruptly out of rational self-interest or internalized social structures. Drawing on a review of relevant literature, this article suggests a reframing to better align research on IT and government corruption with a socially embedded perspective that considers the formative organizational and broader contexts of developing countries to improve explanations of the complex and seemingly intractable phenomena.

Keywords: Government Corruption, Information Technology, ICT4D, Literature Review, Social Embeddedness, Contextualist Research.

1 Introduction

Government corruption—defined as the misuse of public office for private gain [1]–[4]—has been suggested to be more prevalent in developing countries [5]. Corrupt practices at the government-citizen and government-business interface in developing countries have been associated with structural and operational deficiencies [6]–[10], as well as poor developmental outcomes [11], [12]. Given such nexus of government corruption with an inefficient and ineffective administrative apparatus, attempts at controlling the former often involve efforts to reform the latter [13], [14]. IT implementations have been carried out in developing country governments to improve services and to stamp out corruption [15]–[17]. But despite extensive computerization [17]–[20], their interplay with corruption remains unclear as diverse literature report mixed and contradictory findings.

While corruption is universal, its endemic and widespread nature in developing countries calls for consideration of context and its implications for IT in the fight against corruption. For example, the historical, political and broader social context of developing countries have been suggested to entrench government administrations

where officials routinely control public office for private gain [21]–[23]. Yet, many corruption studies ignore context by assuming endemic corruption as a behavior by opportunistic, or perhaps immoral people – a view that might lead to the problematic conclusion that people in developing countries must be particularly opportunistic or immoral.

Through a review of the extant literature we discuss understandings of the role of IT in the fight against corruption. We suggest that extant research on IT and government corruption in developing countries undertheorize IT and corruption. The implication of such undertheorization is examined through a theoretical lens of social embeddedness [24], which allows equal consideration of both social structures and actors in explanations of (corrupt) action. Consistent with understandings of theorizing in ICT4D that stress the significance of the developing country context in explanations [25]–[28], we propose a reframing that considers the nature of corruption as socially embedded within the peculiar historical and broader context of developing countries—that is, as neither *undersocialized* (actor focused) or *oversocialized* (social structures focused).

The rest of the article proceeds as follows: first, we outline the perspective of social embeddedness and its relevance for studies of information technology in developing countries. We then describe our methodology and present findings of our literature review. The literature is discussed, and the article concluded.

2 IT and Government Corruption in Developing Countries

Early empirical studies of the organizational effects of IT explored government administration reform contexts [29]–[31]. These studies reported limited, and questionable outcomes despite expectations of IT’s potential for organizational change. IT was shown to reinforce existing values, interests and power structures, rather than transforming [29]. Scepticism remains regarding the capacity of IT to reform malpractices like corruption rather than “amplifying” them [32]–[34]. The challenge in public reform appears to be not so much one of technology, but rather, how heterogeneous actors with entrenched interests enact IT [35]. An overarching view is that IT does not deterministically reform or stamp out corruption; social forces constrain or enable effects of IT. However, this is not to suggest that IT plays no role. The salient questions are why, how and under what conditions IT and government corruption interplay for specific outcomes.

To answer these questions, an ICT4D-oriented theorization of IT’s interplay with, or effects on government corruption in developing countries might involve some conceptualization, implicit or explicit, of government corruption, IT, and the nature of their relationship in given organizational or social settings [36]. To the extent that researchers pursue these aspects differently or not at all, findings of various studies of IT and government corruption vary and tend towards incongruence. Hence, while methodological and conceptual pluralism are beneficial for understanding complexities of IT and government corruption [37], it is important to clarify assumptions about govern-

ment corruption, IT, their relationship, and the significance of context; and as needed, points of departure from relevant contradictory findings.

Next, we present general understandings of corruption in the social sciences (section 2.1), then review three views of social action that might frame conceptualizations of government corruption in the extant literature (section 2.2). In our review of the literature (section 4), we discuss the implication of technology in relation to these alternative views of action (*qua* government corruption).

2.1 What is Corruption?

Corruption is universal and has a long tradition of work in the social sciences [38]. However, definitions are contested and consensus elusive [4], [39]–[41]. Earlier moral, ethical and legal definitions lacked scope across place and time [38], [42], and economic perspectives of corruption that view it as a form of rent-seeking or as a variant of the principal-agent problem are based on narrow assumptions of individual rational agents, devoid of contextual influences [43], [44]. Such assumptions of rational self-seeking have been shown to be untenable and lacking universal merit because other intrinsic motivations lower corruptibility [45].

Most definitions derive from corruption among ‘standalone’ economic agents and view corruption as happening with one party (e.g., embezzlement, fraud, abuse of government property) or two (e.g., bribery, ‘speed money’, kickback, collusion). Another approach is to view corruption in socialized terms, for example, by considering the implication of social networks and relations [46]. By admitting corruption among multiple parties in a social system, the role of social norms and institutional conditions (beyond individual rationality) emerge. Social norms appear to underpin complex corrupt practices such as patronage, clientelism, cronyism, money laundering etc., that might be less explicable by economic assumptions of rational self-seeking agents.

Corruption has also been understood by looking at specific forms it takes e.g. grand versus petty/street-level corruption related to the hierarchy of officials or the amounts involved [2], [3]; systematic versus venal related to whether corruption is for political ends or for private economic interests [32], [47]; base versus permeated, related to whether corruption occurs in national institutions or stakeholder service systems [48]; and a host of practices related to whether a corrupt individual acts alone, in interaction with another or multiple parties [46], [49].

2.2 Alternative Views of (Corrupt) Action

Foundational to theorizations of the link between IT and corruption is the way in which corruption is conceptualized, that is, the nature of corruption as a particular kind of action or behavior. In general, views on the nature of action and behavior vary across the social sciences with two, economic and sociological—common in IS, ICT4D and related fields. The economic view conceives action/ behavior as the result of rational choice by self-seeking, utility-maximizing agents with perfect information, whereas sociological views ascribe action to a configuration of social structures and agency (e.g. either through agents internalizing structures or structural association [50], [51]).

In his seminal work on economic action and social structures, Granovetter [24] presents three contrasting perspectives on the nature of action. He identifies two extreme views—undersocialized and oversocialized action—and a middle perspective of socially embedded action. The undersocialized view, common with economic assumptions of action, take the actor as a rational, self-seeking utility maximizer with perfect information (*homo economicus*), whose calculative decisions are their own, independent of society. The oversocialized view, common with sociological assumptions of action, take actors as chiefly guided by internalized social norms and structures (*homo sociologicus*).

A critique of both views is that they ‘atomize’ action and behavior by focusing on the individual. A socially embedded view acknowledges this limitation in the undersocialized and oversocialized views and considers action as intertwined with complex, dynamic systems of ongoing social relations that occurs within specific contexts. Such view of embedded action echoes elements of structuration theory [50], [52] in that in explanations of action and behavior they both advocate due consideration of the individual and the social (agency and social structures). Furthermore, an embedded view of action enables exploration of the significance of formative organizational and broader contexts on particular phenomena involving IT [53], [54] —an important concern in ICT4D research [25], [36], [55].

3 Methods

Using an initial structured protocol and search strategy we systematically select and review relevant literature from an initial list of leading ICT4D, IS, as well as related Management, Public Administration, and Development journals. From an initial hit of 2,794 articles matching title-abstract-keywords associated with information technology, government, corruption, and developing countries, we obtain a set of 31 highly relevant empirical studies that match most of the key words searched, and whose titles and abstracts indicate substantial treatment of corruption. From this set of 31 we use a forward and backward bibliographic snowballing [56], to identify an additional set of 33 relevant studies; bringing to 64 our total number of studies for review. We then conduct a data extraction and open coding exercise to identify mutually exclusive themes in relation to corruption, as well as details of various studies such as research approach, empirical evidence, connection to theory, findings, as well as level of analysis. We take a ‘systematic approach’ to identifying relevant studies and a ‘traditional narrative’ literature review in our write-up, combining strengths of both [57]. [Detailed appendices excluded due to word length but available upon request].

4 Literature Review Findings

Our systematic review of empirical studies on IT and government corruption in ICT4D, Information Systems and related publications of Development, Management, and Public Administration, reveals three broad categories of research on IT and corruption: (1) observational studies of IT, corruption and related variables (2) Case studies of IT as an



4.1 Observational Studies of IT, Corruption and Related Variables

Observational studies comprise a significant portion of research on IT and government corruption (Fig. 1). Studies adopt statistical or econometric approaches to draw inferences or to establish relationships between variables. They assess relationships between measurable corruption proxies such as ‘corruption perception’ or ‘control of corruption’, IT-related variables, and socioeconomic or demographic variables. Studies commonly exploit publicly available cross-country corruption data from international organizations, e.g., Transparency International’s corruption perceptions index (CPI), and the World Bank’s control of corruption index (CCI), to test hypotheses that may or may not be sensitized by theory, or to develop explanations. Corruption related datasets are combined—as dependent or independent variables—with datasets on IT and related variables to assess associations, and less commonly, causation.

IT-Related Constructs as an Independent Variable (Corruption as Dependent). IT application in government processes is suggested to reduce corruption [58]–[63]. E-government is said to enhance government-citizen relationships and to enable monitoring and control of public officers’ behaviours [59], [60]. It has also been suggested that e-government and internet adoption act complementarily to reduce corruption [64]; that rule of law is a powerful pre-condition if e-government is to reduce corruption [63]; that there is an inverse relationship between Internet diffusion and government corruption that is mediated by voice and accountability [65]; that the level of e-government development is negatively associated with national level corruption in political, legal and media institutions, as well as mediated effects in business and citizen service systems [48]; that e-government service maturity contributes to controlling corruption, and national culture moderates the anti-corruption effect [66]. Government web presence, online participation, mobile phone penetration and internet adoption have also been associated with lower levels of corruption [67]–[71]; as have social media penetration [72], [73]. Other studies report contradictory outcomes as technology investments might either provide enablers for corruption control or enhance opportunities for other forms of corruption [74]. The direction of causality between internet adoption and corruption is, however, said to be bi-directional [75], suggesting more complex relationship between the two.

IT Related Constructs as a Dependent Variable (Corruption as Independent). Few observational studies explore how corruption influences IT-related variables despite corruption being suggested to inhibit e-government and to “make it unlikely for e-government to progress beyond basic information publishing”[76]. Despite fewer studies looking at corruption as an independent variable, anecdotal and case study evidence supports the view that corruption inhibits the potential of IT to render change in government administrations of developing countries. Corruption in developing economies has been suggested to restrict moral and governance capacity required for e-government success broadly, such that public administrations inevitably end up with systems that fail to meet stakeholders’ expectations [77]. For example, in Malawi, a

state-of-the-art Integrated Financial Management System (IFMS) implemented to help control government spending, was secretly manipulated by government administrators leading to massive embezzlement [78], [79]. In Hyderabad, India, a successfully implemented hotline system intended to streamline complaints and repair requests to the water board was perversely used by administrators who resented the increased monitoring. Subsequent follow-up visits on complaints which administrators had reported as resolved revealed that in roughly half of cases, repairs had not been made [7]. In Karnataka and other parts of India, despite end-to-end computerization of the public distribution system, widespread leakage persisted along the supply chain [9], [10], [80]. In Ghana, Zimbabwe, and elsewhere, despite digitizing court records, 'missing docket' remains a *modus operandum* for court administrators who conceal case files to induce bribes from litigants [81]–[84].

Context in Observational Studies of IT and Corruption. Context is not problematized in most observational studies. However, patterns emerge that relate to the broader national context. For example, magnitude of e-government effects on corruption has been shown to vary across cultures [85], and to be higher in developing countries [61], [62]. Gross domestic product (GDP) per capita and education are significant factors influencing IT potential in curbing corruption, implying that using IT to fight corruption might be more effective in concert with socioeconomic development and education improving strategies [86]. Information access is also associated with lower corruption, pointing to significance of the digital divide across countries for corruption [87]. Rule of law is a determinant of lower corruption and policies based on internet and mobile phone use are strengthened by legal enforcement [88], [89].

4.2 Studies of IT as an Anti-Corruption Tool

Studies explore the question of how IT might work as an anti-corruption tool. A frequent thread in such research is the role of IT in enabling transparency and accountability, based on a theoretical assumption that corruption arises from the agency problem, manifesting through information asymmetry and unchecked monopoly power. Studies often draw upon theoretical lens such as affordance [90], surveillance [91], accountability [92], the panopticon [93], agency theory [94], [95], Foucauldian ideas on knowledge and technologies of power [96], general deterrence theory [89], among others. Corruption is not considered directly in such studies (largely due to methodological and empirical constraints of observing and measuring corruption) but through perceptions of it, or in relation to the *potential* role of IT in its constraint, such as for transparency, accountability, or some other means (rather than an *actual* role observed in empirical settings).

IT for Transparency and Accountability. A commonly noted way IT is suggested to control corruption is by enabling transparency and accountability [97]. For example, an e-government initiative for anti-corruption, the Online Procedures Enhancement for civil application (OPEN) system in Korea is said to have had impressive reform and

anti-corruption effects through transparency and accountability mechanisms [98], [99]. In implementing OPEN, the regulatory dimension as well as strong leadership were crucial enablers for success [100]. IT is also claimed to enhance surveillance capabilities of government [91], which might in turn increase transparency and enable accountability, for example, by enabling vertical and horizontal 'hybrid' forms of monitoring [101], creating a 'panoptic' organizational control [93], and enabling deterrence [89]. Aside enterprise systems, social media has been suggested to allow openness and accountability that might reduce citizen perceptions of corruption [72], [73], [90]. Low news media rights, low internet and cellular phone use, among other factors, are claimed to be indicators for low levels of accountability and higher levels of corruption perception [92].

Nonetheless, as illustrative cases from Brazil and Nigeria suggest, IT-enabled transparency initiatives do not control corruption independent of organizational and broader historical and national context [102], [103]. Furthermore, media (radio) programmes do not offer a new platform for citizens to challenge those in power, but are spaces where existing power structures reproduce [104]. E-government initiatives to discipline public sector staff towards a particular mode of working, rather than reforming the provision of public services, are more likely to reproduce the established practices it seeks to change [96]. Neglecting organizational deep structures, as well as political timing, are additional factors in IT failure to meet government objectives [105].

Other Means of IT as an Anti-Corruption Tool. Aside transparency and accountability approaches, studies identify alternate means of how IT might make a difference in corruption control. For example, IT might enable reduction of corruption opportunities in organizational settings by reconfiguring work practices [106]. Also, transaction cost economics concepts such as bounded rationality, opportunism, and asset specificity are viewed as applicable to corruption, such that corruption varies in accordance with changes in the specificity of assets invested to support corrupt transactions [107]. Computerization initiatives that reduce uncertainty and asset specificity of government services are therefore suggested to lead to lowered perceptions of corruption [108]. In addition, IT might enable corruption control through its institutional effects such as strengthening regulatory measures [100], or introducing institutional logics that might transform corrupt government practices over time [109], [110].

Context in Studies of IT as an Anti-Corruption Tool. Organizational context affects the potential of IT as an anti-corruption enabler. Weak administrative and technical capacity in African contexts are said to condition high likelihood of IT failure in reform efforts [111], [112]. Strong administrative and technical capacity in Korea enabled success of IT-enabled anti-corruption efforts such as OPEN [100], relative to the poorer performance of similar system in Bangladesh [99]. Broader context is also shown to be a significant influence on effects of IT in anti-corruption. For example, rather than focusing on assumptions about the electronic media as a tool of accountability, Stremlau

et al. [104] emphasize the unexpected effects radio programs have in their social and political context, including overlapping relationships between on-air and off-air networks to reproduce power.

4.3 Studies of Focal IT Phenomena in a Setting of Corruption

Corruption has been noted in passing or in name only in various studies of IT phenomena in developing country governments [9], [109], [113]–[115]. Consideration of corruption is not sustained, and comes up in relation to some focal IT phenomena such as adoption and use, IT failure, unrealized implementation outcomes, etc. For example, Masiero [10], [113] studying the computerization of India's Public Distribution System (PDS) in Karnataka, notes the widespread government corruption that enables leakage and diversion along the supply chain ("rice mafia"), thereby impeding effective IT-enabled provisioning to the vulnerable poor. Such entrenched corruption defining the context of IT related phenomena in developing countries is suggested to have institutional and historical roots [109], [110], [112], and to involve rationalities present in developing countries [116].

5 Analysis and Discussion

5.1 View of (Corrupt) Action in the Extant Literature

Our literature review of IT and government corruption in developing countries identifies three broad research orientations: (1) observational studies of IT, corruption and related variables (2) Case studies of IT as an anti-corruption tool (3) Case studies of focal IT phenomena in a setting of corruption. Studies exhibit conceptual as well as methodological diversity, with observational studies being the most common. Studies are published mostly in non-ICT4D journals (Fig. 2) where the link between IT/ICTs and development is seldom problematized, and the setting of developing countries is not a substantive consideration.

This observation is significant as ICT4D research requires careful framing and theorization that considers the context of developing countries seriously if it is to elucidate the peculiarities of IT related practices in such settings [25], [36], [55]. A major puzzle remains why corruption is endemic in developing countries (and their government administrations in particular); and relatedly, how and why IT faces exceptional challenges when deployed to support reforms in such contexts. The three orientations of research reviewed provide limited insight into these questions that require probing the historical, organizational and broader context of developing countries.

As suggested in section 2.2, one way to view the extant literature is by recourse to their assumed view of the nature of corrupt action (and relatedly, the implication of IT interventions). Specifically, the degree to which corruption is assumed to be a phenomenon of 'atomized' individuals (whether as the action of a self-interested economic agent or a passive agent chiefly driven by internalized social structures),

versus something more complex involving actors embedded in specific social settings and nested relations.

In that regard, observational studies of IT and government corruption – the dominant research approach in our sample—is seen to adopt an undersocialized view of corrupt action since it relies on economic assumptions of standalone, self-interested actors whose ongoing social relations are not considered. Exemplary observational studies draw evidence from macro-level country and cross-country data to suggest effects of technology on controlling government corruption [48], [58]–[61], [117], consistent with a rational choice theoretic understanding that individual (micro) level phenomena aggregate to the macro level. But such aggregate level studies typically fail to show how and why IT interplays with corrupt practices in specific ways under salient contextual or cultural conditions [85], [118]–[120], or how the context of developing countries matter.

Case studies that explore how IT might function as an anti-corruption tool similarly tend to adopt an economic view of actors that does not adequately consider the social context and dynamic ongoing relations of corrupt action. The undersocialized economic view considers IT as a tool that solves technical-rational problematizations of corruption—for example, as a rent-seeking behaviour or principal-agent problem—through mechanisms such as reducing information asymmetry by enhancing transparency, reducing opportunism by re-engineering processes, controlling (constraining/enabling) behaviour, or disintermediating corruptible agents by increasing automation.

But the endemic misuse of public office for private gain in developing countries is not adequately explained as a problem of corrupt individuals *per se*. Such individualistic framing might imply some undesirable personal traits or motivations in people from developing countries as causal (an untenable and discriminatory proposition without basis in contemporary social science). Rather, explanations of endemic corruption in developing countries (and the role of IT) might be usefully related to the peculiar, historically formed structural conditions and ongoing social relations.

Yet, in addition to the lack of sustained focus on corruption, approaches that look at IT phenomena in a setting of corruption can be said to assume a view of corrupt action that is oversocialized, meaning the influence of the prevailing social setting on corrupt action is simply taken for granted. From such perspective, IT appears subjugated to social forces of corruption and is said to "amplify underlying social structures", values and interests that drive corruption, or is at best epiphenomenal [28], [29].

5.2 Towards a Reframing of Corruption Research in ICT4D

Although corruption is frequently understood as deviant behaviour by particular corrupt people, it might be fruitfully addressed as a socially embedded phenomenon rather than a problem of 'atomized' actors (isolated rational agents or passive actors internalized with social structures). An embeddedness approach highlights the simultaneous importance of actors and the complex social settings and dynamic relations in which they are situated and act.

Various theoretical lenses might be used to explore an embedded view of IT and government corruption in developing countries. For example, structural views of action and IT related practices, as well as related theoretical positions such as the institutional logics perspective which considers individual cognition and its recursive relationship with broader social structures. For example, in a study of IT supported government administration reforms in a developing country, Addo & Avgerou (unpublished) consider the interplay over time of different IT systems with government corruption under different institutional arrangements. To explain the interplay of IT and government corruption, they trace changes in the institutional and sociotechnical work environment and link these to changes in work arrangements within which they are embedded and use IT. Such work is an exemplary ICT4D exploration as it takes seriously IT and organizational change while problematizing the development context and the embedded nature of corruption.

Furthermore, given that economic and social exchange are facilitated by being embedded in a social structure that goes beyond individual level motivations [24], [121], more exploration could be made of the importance of formal and informal institutions, as well as embeddedness in social networks that make up the fabric of economic life [122]. Social structures and network ties are noted as significant for sustaining corrupt transactions [3], [123], [124]; as are norms and trust relations beyond individual self-seeking [125], yet their implications for IT and government corruption appear under-explored.

Methodologically, while studying corruption directly remains a challenge, more empirical studies that draw upon ethnography (with its ‘thick description’) might enrich knowledge of corruption, its experience in developing country settings, and the role of IT. Other forms of empirical evidence and creative research designs are also needed to probe the characteristics of organizational and broader contexts in developing countries and their influence on corruption and related situated IT phenomena.

6 Conclusion

For IT interventions to enable meaningful gains in the fight against government corruption in developing countries, a good first step might be to dismantle the still common technical-rational view of IT as a simple tool that can (deterministically) accomplish things such as stamp out corruption. Indeed, decades of research in Information Systems and ICT4D undermine such a view. An embeddedness perspective on corruption opens up possibilities to explore why, how and under what conditions IT and government corruption interplay in specific ways within the complex, dynamic, organizational and social fabric of developing countries.

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