

Examining institutional interventions: the case of electronic voters' registration in Nigeria

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ABSTRACT

The Independent National Electoral Commission (INEC) is one of several organizations sponsored by the Nigerian government as part of its e-government initiative to computerize all ministries and its mission to increase the level of adoption and diffusion of ICTs in the country. This strategy may be attributed to publications suggesting a link between ICTs and development, which is prompting the introduction of various information systems within different governmental organizations and fuelling the relentless efforts at promoting them. Research has highlighted the role of institutions in the adoption and diffusion of ICTs. We draw upon one such framework to examine two efforts by the Commission (INEC) to introduce an Electronic Voters' Registration system. This system was designed to provide a more credible electoral process with a view to increasing the participation of the citizens of the country in future voting exercises, hence aiding its adoption as the status quo. However, despite a number of interventions promoting the innovation, these efforts failed to institutionalize the system, which was poorly perceived after the elections amidst reports of high levels of electoral malpractice. We conclude by reflecting on the limitations in this context of institutional interventions and suggest some implications for policy makers.

1. INTRODUCTION

The aim of this paper is to explore the issues affecting the adoption and diffusion of information systems (IS) in the context of developing countries. One of the main reasons for pursuing research in this area is the identification of a link between information and communication technologies (ICTs) and development. Some arguments suggest that ICTs will produce development effects through the operation of market mechanisms (for example, UNDP 2001). Others suggest that such a view neglects the important role of institutions other than the market (Avgerou 2003), the different meanings that may be attached to development (Walsham et al. 2007) and the need to understand the context that matters in any development effort (Avgerou 2008). The number of instances of partial or complete failure of IS in developing countries (ISDC) (Avgerou and Walsham 2000; Walsham et al. 2007) lends support to the latter view. Notwithstanding, DCs have persevered with the continuous introduction of, and reliance on, ICTs for their programmes and services, often inspired by the publications of international development agencies suggesting scope to 'catch up' or 'leapfrog' the developed countries. In short, how ICTs can benefit development and the dynamics of the processes through which this may be achieved is a complex and important area which merits further research.

In their forward to the special issue on ISDC in *MIS Quarterly*, Walsham et al. (2007) argue for the need to move beyond a technological change perspective to study the shifts in social, political and cultural contexts and the wide range of actors and institutions involved in development efforts. Institutional theory and its derivatives have been proffered as a means of understanding these dynamics (Avgerou 2002; Bada 2000; Miscione 2007; Silva and Figueroa 2002). Such research acknowledges the forces that influence the adoption and diffusion of ICTs in DCs and the processes through which local adaptation and cultivation of IS might occur. Our research is oriented towards the former goal. To that end, we employ a framework that examines the role of institutions in the adoption of IT innovations (King et al. 1994). Without contemplating validation (or the lack thereof) of the use of ICTs for development, we believe that such an investigation can be of substantial benefit because insights may be gained which would lead to more successful IS implementations and better efforts at fostering conditions for the usage and adoption of ICTs. We adopt a case study approach which focuses on a voter registration

system in Nigeria by analysing the associated IS programme and the mechanisms it employed in its efforts to institutionalize the innovation.

In exploring the issues affecting adoption and diffusion of information systems, the main question we seek to investigate is:

To what extent are institutional interventions sufficient in promoting the adoption and diffusion of information systems in developing countries?

It is constructive to view issues in this way because it enables a consideration of local contexts to the introduction of information systems. Indeed, Silva and Figueroa (2002) call for indigenous research where it is expected that the concepts of development should come from the people and institutions of developing countries and not the westernized nations. Also, in challenging the rationalities of modernity, Avgerou (2000) states that many of the widely known problems of developing countries are constituted within the western societies' experience of modernity. She advocates the need for alternative courses of rational action which are manifested in IS projects in developing countries for better interpretation of the situations.

The remainder of this paper is organized as follows. The next section presents a critical review of the existing literature within the area of ISDC and introduces the framework that informs our analysis of the case. The following section describes our research methodology and highlights some of the difficulties encountered during the research study and the measures taken to address them. Next, we present the case study narrative followed by our conceptual analysis. Finally, we present conclusions from our study and implications for research and practice.

2. LITERATURE REVIEW

This section examines the rationale for ICTs as an instrument for development, why it is being advocated and by whom. Following this we provide some examples of the use of ICTs in a developing country context and then focus on the role of institutions in the adoption and diffusion of IS.

ICTs and Development

It is typical of developing countries to acknowledge and therefore commit to the use of ICTs in the delivery of improved services. This attitude stems from a belief in the capability of these technologies to bring to the public sector benefits such as improved planning and monitoring mechanisms, cost savings through rationalization, and more effective administration (Gasco 2003; Madon 2004). Further claims rest on the ability of ICTs to reach a larger number of citizens especially people in rural areas, which would produce other beneficial effects such as providing them with vital information to help them to make a living through entrepreneurial activities, thereby eradicating poverty (Madon 2004).

Another contributor to the increasing dependence on ICTs by governments in developing countries is the focus on programmes of international agencies such as DfID (Department for International Development), G-8, UNDP (United Nations Development Programme) and the World Bank. These agencies promote links between ICTs and development under the banners of 'E-governance for Development', 'Technology for Development', etc. and often provide sponsorships for such initiatives. As a consequence, DCs may believe they are deprived of the opportunities for economic growth and social development because they experience a scarcity of ICTs (Avgerou 2007).

However, there are flaws with the 'IT-for-Development' concept. The impact of IT on development is hard to evaluate. Madon (2004) argues that evaluation guidelines tend to focus on the supply-side benefits of ICT infrastructure while ignoring demand-side

considerations, i.e. actual benefits to the communities. Also, there is conflict within the notion of development itself. The discourse shows perceptions of development varying between social welfare in terms of people's basic needs (Little 2003) and capabilities in terms of the achievement of an individual's most desired needs by choice (Sen 1999).

IT Innovations in Developing Countries

Health and education are high priorities for individuals and their governments. IT innovations have been prominent in these contexts in developing as well as developed countries. Issues pertinent to the adoption and diffusion of such technologies relate to their sustainability and scalability. In the health sector, Braa and colleagues have contributed over many years to an action research programme concerned with the development and implementation of health information systems in Africa, Asia and Latin America (Braa et al. 2007; Braa et al. 2004). They identified the need to secure the required financial and knowledge resources and continued political commitment as key institutional factors sustaining the innovations. Similarly, Sahay and Walsham (2006) investigated health information systems in India and found human resources capacity and waning political support as key issues affecting scalability of the innovations. In an education context, some researchers have explained the adoption of ICTs in terms of their economic developmental potential (Mbarika et al. 2007), while others have elaborated the argument to include both health and education (Ngwenyama et al. 2006).

In a public administration context, research suggests that when citizens lack confidence in democratic institutions their propensity to cooperate is reduced, causing obstacles to programmes/government initiatives intended to foster economic growth (Avgerou 2007). Increasingly, then, ICTs are being implicated in governance relationships as governments place greater reliance on IT innovations as means to advance their policies and agendas. Indeed, Gasco (2003) argues that even though governments' primary objective in using IT is to improve administrative efficiency, other effects are produced that give rise to increased transparency and accountability, and thus bolster a government's relationship with its citizens.

Electronic voting (e-voting) is one such innovation in which governments try to engage citizens' participation in one of the most fundamental statutes in a democratic society. Besides engaging an active population of eligible voters, e-voting is seen as having the potential to bring transparency to governments' activities and decisions, combat the corruption that often plagues electoral activities and enable citizens to participate in an elective process that accurately represents the choices of the electorate (Avgerou 2007).

In the case of e-voting in Brazil (Avgerou 2007), technology was not used to instil trust where it was lacking. Rather, confidence in the electoral process stemmed from two significant factors, namely citizens' positive predispositions towards ICTs and towards the institutions responsible for the elections. In many developing countries, these propositions would not hold. A certain level of IT literacy cannot be assumed and the little IT knowledge citizens possess usually comes from exposure to ICTs transferred from developed countries. Also, the institutions involved in the electoral process may not have been established long enough to warrant the required disposition. Furthermore, citizens may not distinguish between ICTs in general and voting as an e-government service, nor between institutions involved in the electoral process and the government regime of the day. Thus, while trust in institutions promoting IT innovations may be an important factor influencing citizens to adopt them (Fichman 2000; Gasco 2003; Goodwin 1996), efforts to isolate the sources of such trust may prove difficult, if not impossible, to achieve.

ICTs and Institutional Interventions

Institutions are formally defined as permanent social entities that exert control and influence the conduct of social agents (King et al. 1994). Institutions recognize their

potential to influence the perception of citizens (Fichman 2000; Gasco 2003) and do so through various interventions, that is, deliberate strategies (e.g. financial, legislative and sensitization programmes) designed to mobilize support for their services and political agenda. Based on this premise, our research examines the adoption and diffusion of information systems in a developing country (Nigeria) through an analysis of the related institutional interventions designed to promote the innovation. Our specific focus is the implementation of an electronic voters' registration system in the country. The Nigerian government, in collaboration with various international development agencies and local bodies, sponsored the programme. Our aim is to examine the extent to which such interventions were successful, in order to suggest possible courses of action for planners and decision makers involved in formulating and evaluating national IT policies. The dimensions of analysis are derived from the framework developed by King et al. (1994).

The merits in using this approach in the context of a developing country lie in the scope it provides to introduce different concepts of development associated with the introduction of ICTs (Silva and Figueroa 2002). Such concepts include indigenous forms of knowledge (Miscione 2007; Puri 2007) i.e. local discourses of progress and development; and prevailing structures of power in the country (Escobar 1995), as well as issues of culture and identity in the development of national level diffusion strategies (Madon 2000).

Framework for analysis

King et al.'s (1994) framework has already been used to examine the role of institutions in ICT adoption in developing countries from the creation of incentives to the promotion of knowledge resources and expertise (Bada 2000; Montealegre 1999; Silva and Figueroa 2002). This research addresses the need for coherent government policy for IT innovation and a better understanding of the role of institutions in adoption and diffusion processes. The dimensions for analysis are seen to occur at the intersection between the influence and regulatory powers of institutions and the notions of supply-push and demand-pull. In short, institutions can legislate to create incentives for innovations and promote the availability of knowledge and expertise; these are prerequisites necessary to impact the production and availability of innovations (supply-push) and also to influence prospective users to adopt them (demand-pull).

The authors describe influence as persuasive control of individuals' practices, rules and beliefs exerted through education, systematic articulation of particular view points (propaganda) and partiality in the allocation of resources. Regulation on the other hand is the direct or indirect control of individuals' behaviour through sanctions or other affirmative means. These two dimensions of control form the basis for all forms of institutional action, suggesting the following categories for analysis:

- i. Knowledge building: e.g. funding of research projects to provide a base of scientific and technical knowledge
- ii. Knowledge deployment: e.g. education and training programs for individuals and organizations to fuel the transfer of new knowledge
- iii. Subsidy: e.g. reduction of liabilities for individuals and organizations engaged in innovative activity as support for their endeavours
- iv. Mobilization: e.g. programs for awareness and promotion which encourage positive opinions of an innovation
- v. Standard setting: establishment of standards that restrict the options available to organizations thereby mandating the use of "preferred" products or processes
- vi. Innovation directive: establishment of requirements directing the production or use of particular products.

3. RESEARCH APPROACH

The categories outlined above guided our data collection process and informed the analysis through which we discuss the events and interventions associated with the case. We adopted an interpretive research approach (Orlikowski and Baroudi 1991; Walsham 1995), in which the aim was to seek rich insight from some key participants rather than generalizations based on statistical significance. Data were collected by the first author three months after the 2007 general elections in Nigeria. At the time, the Independent National Electoral Commission (INEC) was plagued with petitions which required a substantial number of staff to attend the election tribunals set up to respond to allegations of malpractice. In these circumstances some respondents were reluctant to discuss issues they thought related to election results, for fear of being seen as expressing views that could indict them at the election tribunals.

Data were collected via semi-structured interviews with a range of key players in the electoral process. Despite assurances of confidentiality, some respondents were reluctant to have their conversations tape recorded. Thus, in the interests of obtaining frank opinions, note taking was supplemented for tape recording in some cases. In addition to the interview data, material was gathered from other sources, including websites of the government, the electoral commission (INEC) and external agencies.

The research study was conducted at the headquarters of INEC in Abuja, Nigeria. It involved the following participants:

- i. The ICT director: who was involved with the project on both management and operational levels
- ii. ICT Staff: to explore their views due to direct involvement in the IS implementation
- iii. Voter Registry Staff: to elicit information on work practices pre and post implementation of the IS
- iv. IT Advisor to the Federal Government: to obtain information on the activities of the government regarding ICT policy
- v. Eligible voting citizens: to obtain their perspectives on the system and ascertain impact.

The total number of respondents was twenty-four comprising the ICT director, four ICT staff, four electoral staff, the IT advisor to the federal government and fourteen eligible voting citizens interviewed in pairs. Our approach reflects the time-bound nature of the registration and voting processes. We based our study at the headquarters of INEC since, during the elections, its staff had been temporarily deployed to the polling units across the 36 states of the federation. Thus, we were able to gain an understanding of issues arising in wards across the country. Eligible voting citizens were selected based on principles of convenience and snowball sampling (Bryman 2001). Convenience sampling involves making selections based on opportunity, even if decisions are arbitrary or made in an unstructured manner, while snowball sampling is a specific example of convenience sampling in which contact is made with a small group of people who are then used to make further contacts. Owing to the nature of this study, i.e. a system being used in a political setting, the interviews were expected to provoke heated discussions which may reveal otherwise private political views. Thus, it was necessary to select participants who were willing to be interviewed in such circumstances. Some of the respondents were contacts of the first author who were then used to recruit further participants.

An attempt was made to represent the viewpoints of the different social classes within Nigerian society. Thus, four of the participants were artisans selected from the lower level income earners and semi-literate members of the society. A second group of four were middle income earners with white-collar jobs in banking and other more literate private sector industries. A third group of four were people from the more affluent portion of the society whose opinions have some influence on the decisions of those they have dealings

with, directly or otherwise. The final two were active participants of partisan politics, one being a former head of the ruling party and presently a leader of the opposition.

The duration of the interviews was between forty five minutes and one hour. Data were organized in three segments (cf. Oates 2005): (i) those directly relevant to the research focus (as suggested by the framework for analysis); (ii) those providing a broad description of the research context; and (iii) those not directly suggested by the guiding framework. These data informed the case study narrative which is presented in the next section and provides the basis for the analysis that follows.

4. CASE STUDY NARRATIVE

The first national science and technology policy in Nigeria was formulated in 1986 and has been reviewed by successive governments (FMST 2007a). The policy highlights the government's vision to use cutting-edge technologies to drive socio-economic progress and development. Government services are a key focus, which we address in this paper through the case of an electronic voters' register introduced by the electoral commission of the country.

Elections in Nigeria

Elections have been conducted in Nigeria since 1959, but the political history of the country since then shows successive governments plagued by instability, resulting in a cycle of elected democratic regimes interrupted by periods of military rule (BBC 2007; INEC 2007). In recent years some continuity has been achieved, in which the country moved from military rule to a democratic dispensation in 1999 and onwards to further democratic governments following the elections of 2003 and 2007 (INEC 2007).

Elections in the country have always been a cause for concern with international observers commenting that they are neither free nor fair (BBC 2007). They are often plagued with different types of fraud and electoral malpractice which lead to tribunal hearings and even cancellation. Electoral commissions are charged with the conduct of elections. In the politically turbulent situation outlined above, these bodies have been regularly dissolved and re-established from 1966 to 1998 when the present one (INEC) was set up. This paper focuses on INEC and specifically its efforts to combat electoral fraud through the use of ICTs in the voter registration process.

The Independent National Electoral Commission (INEC)

INEC was established in 1998 with a mandate to organize all elections in the country, including the registration of voters and political parties; collation and publishing of election results; and the administration and prosecution of all election related matters (COFRN 1999; INEC 2007). Its headquarters is located in the capital city, Abuja, but it has a presence in all 36 states of the federation.

Elections are organized such that eligible citizens are required to register during a period set aside for registration prior to the elections. During these periods, people are required to report at registration units, which are temporary installations set up in residential areas dependent upon the number of people residing there. The units are supervised by INEC staff deployed from either the head office or state offices. Temporary staff are also employed on an ad hoc basis and trained to provide support for the registration activities.

Prior to the introduction of an electronic voters' register, citizens would be asked to give their name, address, date of birth and occupation when registering to vote. Voters' cards would then be issued to the registrants and at the end of the day the lists from each registration unit would be compiled at the headquarters. On election days, registered voters would be required to go to the polling units, set up in a similar fashion to the

registration units, where the compiled list of registered voters would be displayed for accreditation. This process required confirming that each card holder was registered on the list for that polling unit. The registrant would then be issued a ballot paper on which to make their mark and cast their vote. At the end of the day all the ballot boxes would be transported to secure locations, where counting would be done. The results would then be sent to the headquarters for approval and publishing.

The major shortcoming of this system was that it failed to create a reusable register. The difficulties associated with paper based systems – i.e. the need to update information in cases of relocation, death and age increments – required the creation of a new register for each election. Furthermore, reports of electoral malpractice were rife, alleging that poll clerks registered fictitious names to increase the voting population in a ward or misplaced portions of the register to decrease the number. But by far the most significant malpractice was multiple registrations, in which individuals presented to register multiple times at either the same or different units. The more voters' cards they possessed, the more money they would receive from selling their votes. INEC had attempted to tackle multiple registrations in previous elections, by staining registrants' thumbs or forefingers with semi-permanent ink. Although the ink was expected to outlast the registration period and thus prevent individuals from re-presenting for registration, they soon devised ways of washing out the ink stains.

The Electronic Voters' Register

In an effort to reduce electoral fraud, INEC introduced an electronic voters' register for the 2003 and 2007 elections to replace the fully paper based process. A major objective of the system was to have a comprehensive database of eligible voting citizens which would eliminate the need for re-registration at subsequent elections unless the citizen's circumstances changed.

In 2003 the new system involved the use of Optical Mark Reader (OMR) forms. Citizens registered by putting their thumbprints on the forms and shading off their personal details alongside the corresponding alphabets. Forms were then collated within each ward, scanned onto the system and the OMR software transcribed the shaded portions into text for storage in the database. Biometric verification was run within each ward to identify and disqualify multiple registrants. Owing to the high error rate experienced with this system, INEC replaced the OMR forms with direct data capture of registrants' details in 2007. These details were entered directly on to a digital form including thumbprints and photos, providing an opportunity to confirm accuracy of the data before the voters' cards were printed and handed out for on the spot collection. At the end of the registration period, each ward was required to print and display its list of registrants which would be used for verification of voters on election days.

The system was introduced based on the recommendation of IFES (International Foundation for Election Systems), a non profit democracy development organization funded mostly by the US government and contracted by INEC (INEC 2007). IFES has worked on democracies in over a hundred countries worldwide (IFES 2008). The key focus of its work in Nigeria is strengthening the capacity of election administration bodies to ensure credibility in elections and strategic planning for election management. Thus in response to the needs emerging from previous electoral processes, the recommendations of the electoral review team included the reform of the legal framework for elections, election dispute resolution and the system of voters' registration.

Our study revealed two major issues with this computerization effort. First, there was a high level of fraudulent activity within the registration and electoral processes. Thus, numerous disputes had to be resolved in election tribunals and the result was denounced by the European Union and other international observers, who adjudged the elections

anything but “free and fair”. Second, citizens’ prior experience with electoral processes, coupled with uncertainty about the capabilities of the system and INEC’s ability to implement it successfully, caused scepticism leading to reluctance on their part to participate in the exercise. Furthermore, these issues arose despite a number of institutional interventions that were intended to mobilize support for the system.

Institutional Interventions Supporting the Electronic Voters’ Register

Our research identified different institutions promoting the usage and adoption of the voter registration system and all other activities related to the elections. A Joint Donor Basket Fund (JDBF) was put in place by the United Nations (UN) to develop, fund and implement projects to enhance the civil society’s participation in the electoral process. The contributors of the basket fund include the Department for International Development (DfID), Canadian International Development Agency, United Nations Development Fund for Women (UNIFEM), United Nations Development Program (UNDP) and the European Union (EU). The main objective of the project is to help achieve transparent and credible elections that are domestically and internationally recognized, by strengthening and promoting the technical and operational capacity of INEC in the conduct of elections and maximizing people’s confidence in the outcomes (INEC 2007).

The key projects sponsored by the UN JDBF include deploying IFES staff to support the election administrators; voter education efforts which included partnering with IFES and the National Education Research and Development Council (NERDC) to produce a voter education handbook for use in school curricula; production of voter education docudrama for broadcast in conjunction with the Nigerian Television Authority (NTA); training for INEC staff and the police and other security forces safeguarding the elections.

The federal government, through its ministries and INEC, also promoted the system by sponsoring media campaigns, sponsoring pilot registration schemes in the capital territory and demonstrations of the system for the National Assembly and the populace in general, providing subsidies and import duty breaks for suppliers of the systems, and provision of sundry funds to mediate trouble situations.

In the remainder of this paper, we examine the institutional efforts to promote the adoption and usage of the electronic voters’ registration system and ensure a significant voter turnout and participation by all stakeholders. We draw on King et al.’s (1994) framework to analyse these interventions and reflect on the reasons they failed to achieve desired outcomes.

5. ANALYSIS

Knowledge Building and Deployment

Knowledge building refers to actions taken to generate scientific and technical knowledge required to produce or use innovations, while knowledge deployment involves stimulating the dissemination of new knowledge by means of individuals, organizations or knowledge repositories. In this sense, King et al. (1994) suggest that knowledge building is necessary for the production of innovations, but is not essential for their use i.e. for their adoption and diffusion, whereas knowledge deployment is required for significant production or use of IT innovations.

The most obvious type of knowledge building is research and development, whereas forms of knowledge deployment include the general provision of education to the population and the use of already knowledgeable individuals and organizations in establishing operations in the country (King et al. 1994). The latter approach not only

ensures skilled and specialized implementations, but also effects training either directly or indirectly through exposure for the users of the systems.

Policy documents produced by the Nigerian government's Federal Ministry of Science and Technology (FMST) recognize the essential role of research and development in sustaining scientific and technological infrastructure (FMST 2007a). However, we found no substantive evidence of a research effort involving INEC staff prior to the introduction of the electronic voters' register. Rather, the system was implemented based on the recommendation of IFES, privileging imported technical/rational knowledge over indigenous sources.

The approach to generating and deploying knowledge was to integrate a panel from IFES and the European Union Election Observation Mission who were called upon to support staff training in the use of technology for electoral processes and establish the protocols of democracy and good governance in the conduct of elections. This panel consisted of an 11 member core team, 66 short term and 60 long term observers from 21 European Union states. Training was carried out by the vendors who supplied and installed the system.

It would be reasonable to expect a certain degree of proficiency from users of the system due to these efforts at knowledge generation and deployment. However problems were encountered with the adhoc staff contracted for the registration exercise:

"You train a set of people [temporary staff] to carry out the work, but on the field you see a different set. The original persons trained would have subcontracted their jobs to relatives and friends who do not have adequate skills for the roles. And there were no measures to ensure compliance from the parties concerned. It was simply impossible to monitor everyone involved with the registration process" (Assistant Director, Voter Registry department).

Another problem related to under-aged registrants:

"there were reported cases of under-aged registrants. The recommendation for suspicious cases was an interview of the individual by the representatives of the political parties who would have to come to a unanimous decision before allowing such individual to register. No amount of training would have equipped the commission's [INEC] staff to deal with such situations effectively without the use of proper identification" (ICT director).

These two statements reveal deficiencies in the organization and operation of the system in dealing with identity issues, highlighting the limitations of the institutional interventions. In the first case, compliance and monitoring mechanisms were insufficient to prevent subcontracting of temporary work to untrained staff during the registration period. In the second case, a lack of records in the form of birth certificates, international passports or other adequate forms of identification hindered the process of eradicating the electoral malpractice of under-aged registrants.

Further problems arose in some cases due to religious and cultural beliefs:

"some people refused to have their pictures taken. They said it was against their religion... The turnout for registration was low in the beginning. It is the Nigerian factor to leave everything to the last minute. We are only punctual when there are sanctions or rewards. People were demanding compensation for registering. Some even asked for copies of the pictures taken" (Assistant Director, Voter Registry department).

Religion in this context refers to religious beliefs of supernatural control and sanctions. Specifically, certain groups believe that perils could come from unnecessary exposure in the photographic images since this is a means through which divine requests are made, i.e. people attach photographs of themselves, friends or family to a list of requests and hand them over to their religious leaders for divine intervention. Thus an accepted method of identification in many nations proved problematic in this context.

Revisiting King et al's notion that knowledge building is necessary for the production of innovations but is not essential for their use, i.e. their adoption and diffusion, our work suggests that, when systems are imported into a DC context, knowledge building has increased importance for adoption and diffusion. The fact that there was no substantive research effort involving INEC staff reveals the rationalistic assumption that an information system produced abroad can be transferred to a DC context without the need for prior engagement of the indigenous users. However, such engagement might have revealed that certain underlying assumptions on which the system is based (e.g. the presence of adequate monitoring mechanisms, appropriate forms of identification, and particular cultural beliefs) are inappropriate in the Nigerian context.

Subsidy and Mobilization

Institutions may intervene to provide subsidies to innovators or users to offset the costs or risks they sustain during production of an innovation or usage which aids its diffusion. Mobilization, on the other hand, involves intervening by spreading messages designed to persuade actors to think in a certain way about an innovation. On this basis, King et al. (1994) suggest that subsidies may be crucial instruments in the process of innovation, but are not essential to the production and use of an innovation. However, mobilization efforts, while important but not essential stimulants to the production and use of innovations, can have a dramatic effect when used in conjunction with other institutional interventions.

Subsidies may take different forms, but reference here is to activities targeted to achieve a specific outcome. Such interventions within the Nigerian government usually take the form of grants and loans, e.g. the Technology Innovation Fund, a Ministry of Science and Technology initiative, established for SMEs that want to acquire IT innovations for business support, and the Computer for all Nigerians Initiative (CANI), a National Information Technology Development Agency (NITDA) initiative, which subsidizes the cost of computers and allows local computer producers to import required parts without paying the required levies (FMST 2007b). In this case the government is subtly directing preference towards domestic products, thus empowering local industries in addition to aiding diffusion of the innovations.

Mobilization uses more direct means by spreading positive messages to influence stakeholders. The most common methods are advertisements, awareness campaigns, publications, conferences and exhibitions demonstrating the use of the innovations. However, higher education institutions and professional associations also have significant mobilization roles promoting innovations to key players in organizations as essential to organizational welfare (King et al. 1994).

The electronic voters' registration system benefited from both forms of intervention, i.e. subsidies and mobilization. Funding of prototype development and demonstration projects is a form of subsidy (King et al. 1994) and this can be likened to the government's sponsorship of the pilot registration schemes carried out in the federal capital city of the country prior to the nationwide implementation of the system. Subsequently, full funding for the project was provided by the federal government along with the withdrawal of import duties on all system related items. In order to mobilize people to participate in the registration exercise an extensive awareness campaign was mounted informing citizens and other stakeholders about the objectives and merits of the system. This campaign took

the form of advertisements, seminars, demonstrations etc. using all available broadcast media dubbed with slogans, for example “know your rights, register to vote”. Other interventions, though closely related, cannot be easily identified as subsidies or mobilization. For example, at the start of the registration period, there were not enough data capture machines to be deployed at the proposed locations, due to delays caused by the suppliers. To avert the situation, the government provided sundry funds to purchase laptops, digital cameras and scanners as a contingency measure prior to delivery of the machines.

While subsidies can alleviate the costs of production and usage of innovations, the source of the funds can give rise to unexpected impacts on stakeholders’ perceptions of such innovations. As a prominent member of one of the political parties suggests:

“ it is necessary for INEC to become truly independent. The Presidency has too much control over the commission and it can only gain the peoples’ confidence in delivering genuine election results if it can be detached from that control. After all, he who pays the piper dictates the tunes”

This statement indicates a flawed power structure surrounding the sponsorship of the electoral process. Since funding for INEC comes directly from the office of the president in power, some stakeholders believe that the head of government can influence the commission. Thus they are reluctant to participate in, or trust the outcome of, any innovation arising from such interventions, hindering the adoption of the system.

Furthermore, the mobilization messages promoting the system may have been effective in increasing voter turnout, but there was evidence of other parochial interests:

“I don’t think the campaigns had any effect on my decision to register. I was going to register regardless because I wanted to vote to have a chance to replace the government in power”

“some legislators resisted the introduction of the system because they felt they had no control over the outcome. They didn’t see a chance to manoeuvre the system”

Mobilization can also give rise to unintended outcomes if the propagated messages are misunderstood. In this case, the slogans broadcast by INEC and government sources alleging “this is your vote, this is your world”; “computerization will reduce election fraud” were taken by some voters to mean that the innovation would eradicate all forms of electoral fraud and not just registration fraud. Messages that seemed clear to the ICT director and Voter Registry staff were a source of disappointment to eligible voting citizens after the elections amidst reports of high rates of electoral malpractice:

“the selling point for the registration was the end result, which was voting results. We were made to believe that the new system would produce more credible results. Perhaps if that was the case in the end then our perception [of the system] would be different now”

“I thought there would be a difference in the voting pattern. The computerization made me think there would be better accuracy and that results would be immediately available. I didn’t realize it was still going to be manual voting and manual counting”.

Our work suggests some qualification of King et al’s notion that subsidies and mobilization are important but not essential stimulants to the production and use of innovations. Specifically, it highlights the unintended outcomes that can result from such efforts and

how they can undermine the innovations they were intended to promote. For example, awareness campaigns were persuasive in mobilizing people to register for the Nigerian elections. However, when the elections were over, citizens' expectations were dashed as electoral fraud persisted. Questions were raised about the trustworthiness of the institutions promoting and subsidizing the system. In this case, there was increased scepticism, which in the longer term may negatively influence the prospects for the system's future use.

Standard Setting and Innovation Directive

Standard setting refers to regulation constraining actors' options in innovation situations in line with broader institutional or societal goals, while innovation directives are commands to produce or use an innovation or engage in activities that will foster its production and/or use. Thus, King et al. (1994) suggest that although standard setting is an important form of institutional intervention in the production and use of an IT innovation, it is risky and can be counterproductive if employed without the agreement of interested parties. Innovation directives, by contrast, can be powerful stimulants to innovation and diffusion in special circumstances, but are less significant in sustaining production and use in the long term.

Standards are agreements amongst stakeholders about the preferred way of doing things which can be voluntary or enforced by law (King et al. 1994). Standards can explicitly favour an innovation, as in cases where "best practice" is advocated, or they can imply such preferences, as when minimum performance levels are set which require the use of a particular innovation. Innovation directives are commands rather than agreements, which may, for example, mandate how an organization spends its budget, what products it adopts or how its operations are structured. An example is the directive from the West African Examination Council in Nigeria which requires students to check their GCE results online.

The electronic voters' registration project did not reveal much evidence of standard setting beyond the use of electronic means of registration. Although computerization of the entire electoral process is being proposed to the legislative arm of government, it is yet to be agreed upon. However, there were several innovation directives designed to encourage participation. An initial two month period was set aside for the registration of voters. The deadline was extended by an extra month to stimulate further turnout of registrants. Also, some work days were declared public holidays to encourage those who would otherwise have claimed they were too busy to register. Furthermore, some state governors threatened to seize salary from those who did not produce their voters' registration cards to confirm that they had registered. While there is no legislative basis for the governors to enforce such directives, the threat of sanctions was effective in forcing the states' public servants to the registration units.

In this context, the use of standard setting and innovation directives seems to necessitate certain prerequisites:

" there is a gap between setting standards and regulating them in this country, at times it is near impossible to reach certain areas to ascertain the compliance to the standards set within that industry" (IT Adviser to the Federal Ministry of Science and Technology)

" people were shading all sorts, some even shaded outside the boxes..... but in the new system, power outages kept interrupting the registration [process] and some people who promised to return after did not..... a queue is a queue no matter how short. Nobody likes waiting especially in the sun [heat]" (Staff member, Voter Registry department of INEC).

The above statements show that a country's infrastructure (including road and rail links, power supplies, etc.) and its citizens' literacy levels are key aspects affecting the likely success of institutional interventions. In the case of both standards setting and innovation directives, poor infrastructure impacted the long term utility of the interventions, while in the latter case poor literacy levels required the education of citizens above and beyond the requirements of the particular innovation, diminishing the power of the directives to use it.

Reflecting on King et al's notions about the importance of standard setting and innovation directives, their work is based on an underlying assumption that effective regulatory and monitoring mechanisms are in place to ensure compliance. However, even in cases where compliance is intended, structures to aid this compliance might be in short supply. Thus, as with cases of the transference of knowledge from abroad, the framework is found wanting in an appraisal of the situation on the ground.

6. CONCLUSION

This paper examines the introduction of information systems in developing countries and discusses the efforts of the prevailing institutions within these countries to promote the adoption and diffusion of ICTs. The concept of ICTs as an instrument for development was established as a powerful rationale for this approach although its justification was not determined. Instead, our aim was to explore the sufficiency of institutional interventions in promoting the adoption and diffusion of ICTs within the DC context. The focus of our research was a case study involving the adoption and use of an electronic voters' registration system in Nigeria. We employed a framework for examining institutional interventions (King et al. 1994) designed to promote such innovations. This framework guided the collection and analysis of our findings, the implications of which are presented in this section.

King et al.'s framework proved useful in analysing the scope of institutional interventions in the DC context and shedding light on issues associated with IS adoption and diffusion within such countries. Nevertheless, our understanding of why these efforts sometimes fail to achieve desired outcomes prompted us to consider other important themes. Our research suggests that there is a limit to what the institutions can achieve against the desired objectives. Although research has illustrated the significant role of institutions in promoting ICTs in the western countries, the nature of the constraints faced by INEC and the Nigerian government leads us to consider other issues and possible strategies when deploying information systems in developing nations. The difficulties being faced in this case can be traced to different (and additional) challenges highlighted by our study.

For example, the concept of institutions has a different meaning in developing countries. The electoral body in Nigeria has been undergoing a constant process of dissolution and re-establishment and thus INEC has not had enough time to gain the necessary trust required to instil confidence in the citizens, a prerequisite for institutionalization. Thus it is hampered in its efforts to gain general acceptance for ICTs. Governments in most developing countries are in a similar situation – plagued with instability under successive military regimes they have only just begun the process of democratization.

There should also be much consideration for society and its values. Modernization efforts may ignore the prevailing circumstances in the developing countries and this often leads to inaccurate diagnosis of problems. Poor infrastructure is often inherent in such countries (Hempel and Kwong 2001), yet this is an essential element for the successful use of modern technologies, the absence of which may be likened to having hi-tech cars without good roads or cinemas without an electricity supply. Thus development levels are highly exposed in their primitiveness by modernization just as modernization is always hampered by development, creating a fuzzy environment. The decision to adopt certain systems

should be reviewed to take account of the available infrastructure, in addition to issues of power and politics, literacy levels, culture and religion.

Our case study highlights institutional interventions that demonstrate (i) a lack of consideration for infrastructure issues, evidenced by the effect that power seizures had on the registration exercise; (ii) a lack of consideration for literacy levels, evidenced by the 80% error rate reported in the first electronic registration system; (iii) a lack of consideration for power structures and politics, evidenced by citizens' perceptions about INEC, the government in power and the relationship between them; and (iv) a lack of consideration for religion and culture, evidenced by the refusal of some people to participate in the registration exercise.

In suggesting the potential for further research, we acknowledge the limitations of our study. This research was conducted over a three week period by the first author, who is a Nigerian national. More insight might have been gained from a longer study which sought a more diverse range of stakeholder opinions. Furthermore, participants in the study might be more inclined to discuss issues relating to the elections once the election tribunals have resolved disputes. Future research might explore experience with alternative technologies used in the Nigerian context, with alternative systems used in the electoral process (in both voting and registration), and take account of lessons learned from other developing countries. For example, studies could focus on the use of internet or mobile communications technology, which seem to be at a more advanced level of adoption and diffusion. They might also examine experience with e-voting systems in another developing country, for example, Avgerou's (2007) work in Brazil. Or, they may focus on comparative analyses of experience in different countries, which may help to explain why some developing countries have been so successful in innovation while others have not.

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