

E-Governance - the case of DistrictNet in Uganda

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Abstract

E-Governance is a powerful tool for bringing about change to government processes in the developing world. E-governance operates at the cross roads between Information and Communication Technology and government processes, and can be divided into three overlapping domains: e-administration, e-services and e-society. In order to be successful, e-governance must be firmly embedded in the existing government processes, must be supported, both politically and technically, by the governments, and must provide users with reasons to use these on-line domains. In order to maximize the impact, process change needs to be considered part and parcel of e-governance.

In this report, we present and evaluate an e-governance programme in the East African country of Uganda. The programme, DistrictNet, tries to provide transparency at the local government level and to improve the provision of public information through the implementation of ICT. DistrictNet started in 2002 and is on-going. The achievements of the programme are presented and evaluated according to the criteria of the three domains of e-governance and their impact on government processes. On the basis of this evaluation, we elicit lessons that can be used to guide similar programmes at the local government levels in the developing world.

1. Introduction

In the developing world, Information and Communication Technology (ICT) is often welcomed as an important instrument for accelerated change. ICT programmes are used to increase the efficiency and effectiveness of organizations and to help align processes with best practices from the developed world.

Governments in the developing world are under a lot of international and national pressure to review and update their processes. Internationally, donors and governments in the developed world are urging governments of developing nations to increase transparency, support decentralization, decrease corruption and participate in global digital information sharing. Nationally, the private sector demands more openness and willingness to participate in transparent relationships, and citizens are asking their governments to provide better, faster services and to extend their information and service offerings to the rural areas. As a result of these pressures, governments in the developing world are challenged to change more than ever before (United Nations, 2003).

E-government is defined by the United Nations as "A government that applies ICT to transform its internal and external relationships" (United Nations, 2003). ICT allows a government's internal and external communication to gain speed, precision, simplicity, outreach and networking capacity, which can then be converted into cost reductions and increased effectiveness - two features desirable for all government operations, but especially for public services. ICT also enables 24/7 usefulness, transparency and accountability, as well as networked structures of public administration, information management and knowledge creation. In addition, it can equip people to participate in an inclusive political process that can produce well-informed public consent, which is, increasingly, the basis for the legitimacy of governments.

This paper reports on the experiences of DistrictNet, an ongoing e-governance programme in the East African country of Uganda. The goal of the paper is to evaluate the programme against a theoretical background, and also to draw practical lessons from the programme that could provide guidance to new e-governance programmes in the development context. The paper begins by providing some theoretical background for e-governance, which is important to better understand the objectives and design of the DistrictNet programme. In section 3 we discuss the programme, focusing on its beginnings and its achievements so far. In section 4 we evaluate the programme in a larger context and elicit lessons learned from DistrictNet.

2. Understanding E-Government

The work of governments is being reshaped by two ineluctable trends. The first is the movement away from centralized, vertical and hierarchical government machines towards polycentric networks of governance based upon horizontal interactions between diverse actors within complex, multi-layered societies. The second trend is the rapid introduction of ICT aimed at the transformation of the generation and delivery of public services. The concept of e-governance is the convergence between these two trends (Coleman, 2005).

In order to get a better understanding of the potential impact of ICT on government processes, we need to start with a general overview of the role that ICT and Information Systems can play in the optimization of organizational processes, transcending the traditional perception of ICT as mere technology. We then identify types of e-governance and e-government, describe the status of e-governance internationally, and conclude with guidelines for successful e-governance programme design and implementation.

2.1 ICT for change

Information and Communication Technology are important initiators and drivers of change in an organization. The use of ICT creates new possibilities, and ultimately ICT has the potential to reinvent organizations and their services (Leer, 2000).

Dennis and Haley Wixom (2000) identify three strategies for the implementation of ICT in an organization:

1. business process automation (BPA)
2. business process improvement (BPI)
3. business process reengineering (BPR)

The three approaches have an increasing impact on the organization. The goal of BPA is to increase the efficiency of the work of the users. It does not intend to change the work in an organization, but automates the existing processes. In the development context, this often implies that manual processes are supported or replaced by automated processes. For example, data is no longer stored in paper files, but a database management system is introduced to manage information; however, the same information as before is stored, without considering its quality and usefulness. The goal of BPI is to reconsider the processes used and information stored, and to improve upon them by introducing some moderate changes that are generally incremental or evolutionary in nature. The new practice is enhanced both through making the users more efficient and by changing how processes work in order to make them more effective. In practical terms, this means that processes are examined carefully to see whether existing problems can be eliminated during the introduction of ICT. However, BPI does not lead to completely new processes or new tasks of an organization, since it builds on the existing processes. BPR¹ focuses on the fundamental and critical rethinking of an organization's processes. Following the introduction of new ICT, the organizational processes are evaluated, changed or eliminated, and new processes are added in order to improve performance in terms of costs, service delivery, quality and speed. In the development context, we observe that many e-governance programmes focus on the first-time introduction of ICT. This opens up new horizons and allows organizations to deliver new ICT-enabled services that they have not previously been able to offer. It is important to realize, though, that in this introductory or implementation context, BPR can be very technology-driven.

Although business process automation, improvement and reengineering are often considered in a private-sector context, their focus is definitely not limited to the private sector. Rather, they are general concepts for increasing the efficiency and effectiveness of organizations. While ICT is not essential to these concepts, nowadays it lies at the heart of most practical initiatives.

2.2 Domains of e-governance

Heeks (2001a) identifies three main domains of e-governance, based on taxonomies proposed by Ntiro:

1. e-administration: improving government processes

1 The term Business Process Reengineering has attracted enormous attention through Michael Hammer and James Champy's book *Reengineering the Corporation* (1993). In this article we do not promote their radical reengineering approach, but consider BPR as a means to fundamentally reconsider the tasks and responsibilities of an organization, and the processes and tools by which an organization may implement these tasks and responsibilities. That is, ICT can be introduced used to trigger BPR.

2. e-services²: connecting individual citizens with their government
3. e-society: building interactions with and within the civil society

The main purpose of the e-administration is to improve the internal workings of the public sector by cutting process costs, managing the process performance, creating strategic connections within the government bodies, and creating empowerment. Shortening the lead time for passport applications from two weeks to one day is an example of e-administration. E-service initiatives focus mainly on improving the relationship between the government and its citizens by increasing the information flow between them – which, notably, involves two-way communication – and improving the service levels of government towards its citizens. Public service institutes offering citizens the opportunity to apply for business licenses through a government website is one example of e-services. E-society initiatives extend on the previous e-services domain by focusing on institutional stakeholders, such as private sector service providers, other public agencies, and not-for-profit and community organizations. In addition, e-society focuses on building long lasting partnerships and social/economical communities: for example, through the creation of a business community portal.

Practically speaking, the three domains of e-governance are seldom separate in their implementations; rather, they involve overlapping activities as part of the same initiative. To put it more strongly: good e-governance programmes must take into account all three domains.

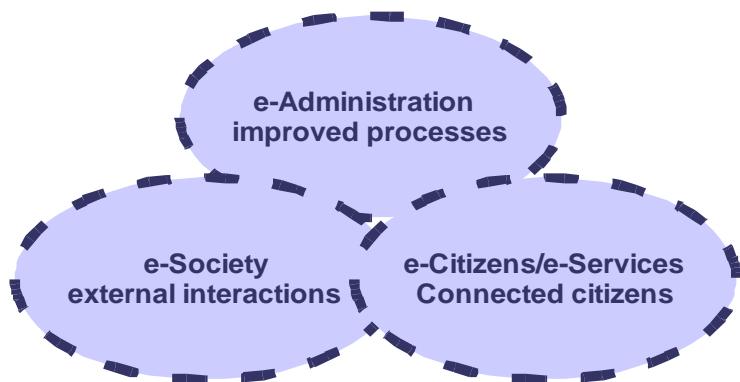


Figure 1: Overlapping domains of e-Government (adapted from Heeks, 2001)

2.3 Where is E-Governance now?

The United Nations' *World Public Sector Report 2003: E-Governance at the Crossroads*, prepared by its Department of Economic and Social Affairs, provides three main conclusions on the current status of global e-government. First, using an extensive survey, the report concludes that developing countries are creating and implementing e-government applications similar to those currently used in developed countries. In fact, says the survey, developing countries are providing "information and services" that "are as – or more – sophisticated and mature" than those currently used in some developed countries. Still, developing countries face certain challenges that are greater than those faced by developed countries in pursuing e-governance. For instance, they must contend with limited financial resources and human capital while trying to develop a sufficient ICT infrastructure, build overall educational and technological skills, and finance widespread on-line access to rural areas and other under-served populations.

In describing the methodology for its Telecommunication Infrastructure Index, the United Nations report admits to placing less weight on the use of mobile technologies than on a country's personal computer density, number of Internet users, number of telephone lines, and on-line population. Regardless, there is evidence that developing countries are addressing e-governance implementation issues through the innovative use of currently available technologies, including radio, television and mobile technologies.

The two additional conclusions of the United Nations report are, first, that both developed and developing

2 The original taxonomy of Ntiro, adapted by Heeks, identifies e-citizen and e-services as two separate classes. In this article we prefer to use the term e-services only, which includes the class of e-citizens.

governments have made little use of on-line transaction services, and secondly, that participation in e-government ranges from "rudimentary" to non-existent. Finally, the report asserts that there is no single strategy for achieving e-governance success, as governments must respond to the specific needs of their particular societies.

These conclusions and assertions present areas of opportunity where developing countries can pursue their e-governance strategies through practical, innovative applications.

2.4 Guiding Principles for Successful e-Governance

In its 2003 report, the United Nations defines guiding principles for success which include the reasons that governments and users go on-line. The guidelines for successful e-governance are grouped in three categories:

- the reasons for governments to use ICT in their operations and to go on-line
- the ability of governments to use ICT and to go on-line
- the reasons for users to use ICT to communicate with the government

The following compelling reasons are identified for the *government* to use ICT in its operations and to go on-line:

1. **Priority development needs that require government involvement.** E-government applications are best embedded in areas that are perceived as closely related to the priority development needs of the society. This approach creates broad support, making it easier to overcome inherent difficulties and to sustain attention, commitment and funding.
2. **Efficiency and effectiveness as key success criteria of government involvement.** It is best if the role that the government plays in such areas is judged partly or predominantly by factors that ICT can bring. The link between ICT applications, optimization of government operations and achievement of important social development goals is a very convincing argument for the continued development of e-government.

The ability of a government to use ICT in its operations and to maintain a successful on-line presence depends on a number of factors:

3. **Availability of (initial) funding.** Even initial pilot e-government operations should start with a good understanding of costs involved and with assured funding that follows careful analysis of opportunity cost. Whenever advisable and feasible, funding should be treated as a business investment and should carry expectations of returns.
4. **Skills and culture of the civil service.** Civil servants must be able (through ICT, change and programme management and partnership-building skills) and willing to support e-government, or at a minimum, must be eager to learn and change. The culture prevailing in the civil service determines the assessment of expected loss of jobs, prestige or power that e-government applications might impose upon individual civil servants and thus the eventual strength and effectiveness of the anti-change lobby (if any such lobby exists).
5. **Co-ordination.** The necessary "backroom" co-ordination and effort - within and between government agencies - must take place before any e-government application goes on-line in order to avoid duplication, assure interoperability and meet the expectations of users.
6. **Legal framework.** E-government introduces unique legal requirements and these should be realized and dealt with early in the process.
7. **ICT infrastructure.** Infrastructure needs should be assessed against the background of requirements and desired results of e-government development plans. An insufficient assessment risks underestimating requirements and limiting results, or alternatively overestimating requirements and leading to the possibility that ICT infrastructure will simply become expensive and idle office equipment.
8. **Political leadership and long-term political commitment.** The chief executive officer of the public sector must be committed to e-government, must lead and build broad support for it, and must be eager to learn. This commitment generates the all-important positive signals that the civil service needs to receive from its top leadership.
9. **Public engagement.** The public should have a personal stake in e-government development. Their engagement should be reinforced by actively, genuinely and continuously soliciting people to participate in the development of e-government applications so that these are custom-crafted to the way people live and work.
10. **Plans for development of human capital and technical infrastructure.** There should be a vision and plans for closing the existing gaps in ICT skills and access. Otherwise, neither

the public administration nor the citizenry can hope to become ICT literate and capable, which are important ingredients for e-government success.

11. **Partnerships.** Early on, the government should involve business firms and civil society organizations (CSOs) as its partners in securing financial resources, skills improvement, better access and adequate capacity to service the ICT network. However, partnerships should never be forged at the cost of transparency, accountability or economic soundness of investments.
12. **Monitoring and evaluation.** Setting clear responsibilities and realistic benchmarks for e-government development, as well as for its transparent monitoring, is an important ingredient for eventual success and helps build the overall transparency and accountability framework in the public sector.

Finally, there must be compelling reasons for the *users* of e-government to go and stay on-line:

13. **Perception of added value.** Any design of an e-government development must incorporate a calculation of the added value that the application intends to bring to individual users. This calculation should be congruent with the needs, desires and/or expectations of the users.
14. **Access and skills.** It should be made easy in terms of time, cost and effort for the potential users of e-government to actually use it. Imaginative solutions for increasing the level of this ease of use must be part of any e-government development plan. They should include, but also transcend, attention to individual access and skills.
15. **Privacy and security.** Security and privacy concerns - culturally defined as they are - must be addressed early on, openly and with demonstrated professional aptitude. The public is likely to expect a breakdown in this area and news (even informal) of even one lapse in privacy or security is bound to become a huge setback with long-lasting consequences.

2.5 Model for Evaluation

It is important to evaluate the performance of e-governance programmes in the developing world. Limited, often temporary funding requires governments to implement the 'first time right' approach. Most of the evaluations are quantitative and founded in the ontological tradition of science, like the longitudinal survey published in the United Nations' *World Public Sector Report 2003* and the work on e-governance and e-commerce by the Institute of Development Policy and Management (see, for example, Heeks, 2001; Molla, 2004). Few qualitative and epistemological studies on e-governance have been reported. In this paper we will focus on the evaluation of an e-government programme that started in 2002 in Uganda and has gone through the first pilot cycle. Information about the programme has been collected through document analysis, interviews and participative observations in the context of an "Action Research" arrangement (Argyris et al, 1990, Baskerville, 1999).

DistrictNet is analyzed along the lines of the theoretical framework presented above:

1. The programme is analyzed according to the criteria associated with its domains (e-administration, e-services and e-society) and the levels to which the programme has supported (automated) or changed existing processes and/or introduced new processes (that is, its engagement with the BPA, BPI and BPR strategies defined by Dennis and Haley Wixom). Figure 2 below presents a growth model.
2. The programme is also analyzed along the guidelines of successful e-governance programmes as identified by the United Nations. This measurement is related to the principles outlined in Section 2.4 and is used to identify the 'Lessons Learned' presented at this paper's conclusion.

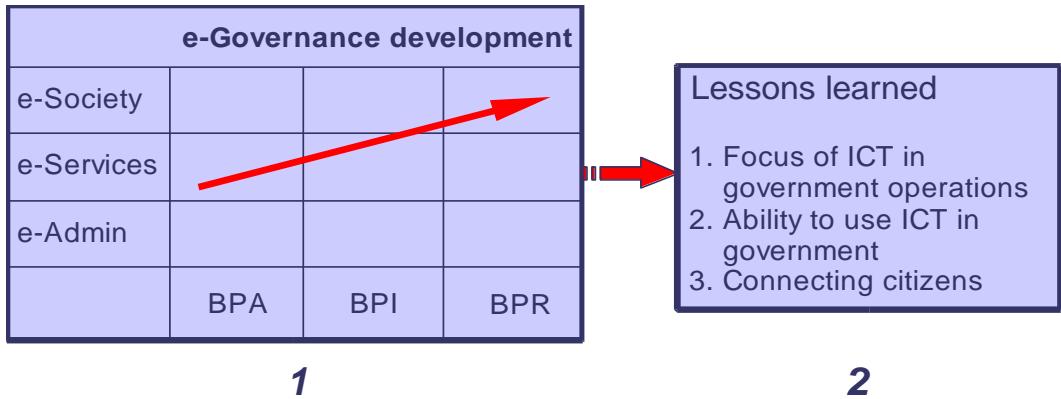


Figure 2: e-Government development cycle

We assume, based on the work of Heeks (2001a, 2001b), that meaningful e-Governance optimizes the operations of the government (through e-administration) and supports human and societal development (by implementing e-services and e-society). In line with the United Nations' *World Public Sector Report 2003*, we consider e-governance that does not result in an optimization of the government processes to be 'wasteful' and e-governance that has very limited or no impact on the development objectives of the country at large to be 'pointless'.

3. DistrictNet – Uganda

Over the past fifteen years, Uganda has shown a remarkable recovery from economical, social and political turmoil. However, in spite of this recovery, Uganda is still a poor country and the penetration of ICT and level of Internet use is low (see National Indicators in table 1).

<i>National indicators Uganda</i>	
Population (000.000)	23.4
Poverty (% of population below \$1 per day)	26.8
Adult literacy rate (% ages 15 and over)	68.9
Urban population (% of total population)	14.9
GDP per capita (US\$)	243
Surface area (000 km ²)	241
Computer usage and Internet	
Ownership of computers (% urban/rural)	3.5/0.4
Internet access (% urban/rural)	4.2/0.1

Table1: National indicators of Uganda. In: Tusubira et al., 2005.

It is against this background that the District Administration Network programme (DistrictNet) started in 2002, with the general aim of introducing ICT to improve transparency of the local government and to improve communication within districts to support decentralization (Weddi, 2005). The programme was focusing initially on supporting e-administration, and the possibilities of e-services were to be investigated during programme implementation. E-society was not within the scope of the programme. However, the overall development objective supported by this programme is government decentralization³. Until May 2005, the programme was fostered by Uganda's Ministry of Local Government (MoLG), and the initial investments and running costs were financially supported by DFID through the International Institute for Communication and Development (IICD) in conjunction with the MoLG.

3.1 Set Up of DistrictNet

The idea for DistrictNet emerged from a roundtable conference⁴ organized by IICD in March 2001. The workshop was themed "ICT for Rural Development" and brought together participants from rural and up-country institutions in public and private sectors. Workshop participants identified the following problems at the district and sub-county local government levels⁵:

1. The lack of a convenient mode of communication between the district and the lower local governments, leading to poor follow-up and coordination of activities, and thus resulting in delays and inaccuracies.
2. The use of paper-based record-keeping for a variety of data and information, including council minutes and statistical data, resulting in many records being lost, or, in the case of those available, being in a form that makes it difficult to find and share information.
3. The use of manual maintenance and processing of financial records, which are consequently often out-dated and inaccurate, leading to reduced transparency and accountability.
4. The numerous reports that have to be prepared manually and submitted from lower local governments to the district, and then from the district to central government ministries, leading to slow and often inaccurate processing
5. The limited access to important information: for example, on government policies; government, donors and NGO programmes that are planned or ongoing; general development information on agriculture, health, etc.

In order to address these problems, the introduction of ICT at the district and lower local government

3 DistrictNet programme proposal, 11th February 2002.

4 The Roundtable Conferences organized by the International Institute for Communication and Development are conferences oriented towards mutual and participative programme formulation. For more information on the roundtable concept, see (IICD, 2004).

5 Mentioned in the programme proposal of DistrictNet, 11th February 2002.

levels was proposed. Emphasis was put on data and voice communication between the district headquarters and the pilot sub-counties and on the introduction of an integrated information system for storing, analyzing and managing financial information.

Based on an analysis of the needs in the Districts and the possibilities of ICT, the programme aimed to achieve five overall goals⁶:

1. Increased availability of management information, measured by the time needed for sub-counties to answer queries from the district headquarters.
2. Increased coordination between headquarters and sub-counties, measured by the volume of data/communication.
3. Reduced costs of coordination between headquarters and sub-counties, measured by the amount of physical travel by officers.
4. Improved IT skills, measured by the usage of the systems.
5. Increased availability of public information, measured by the amount of information spread through notice boards, radio, and websites, as well as the number of information requests by the citizens and the number of queries answered.

The DistrictNet programme was initially designed to be implemented in four districts in Uganda (Mbarara, Lira, Mbale and Kayunga), covering the country's west, north, east and central regions. The Kayunga district was selected because of the unique challenges caused by its remote location. Uganda consists of 76 districts,⁷ which are further divided into sub-counties (with over 900 in the country) and then into parishes. The selected districts were characterized by their long-term political commitment; in addition, the geographical breadth of the programme was chosen to provide a base for its evolutionary growth, based on the premise that pilot districts would inform neighboring districts about their achievements, in the end leading to regional capacity development. Within the four districts, eleven sub-counties were selected for participation.

3.2 Proposed Technical Solution

The proposed technical solution envisaged to realize DistrictNet was, for the most part, simple and straightforward. To improve the communication between the offices in the district, voice and data communication links were needed to connect all the offices in the district headquarters, some of which are as far as two kilometers apart. A client-server based Local Area Network (wired and wireless) was to provide the communication in the headquarters. Within the headquarters, PC's were installed with standard office applications (Microsoft suite), Logics (an Access based Management Information System developed by MoLG in conjunction with development partners), Geographical Information System software (Arcview) and financial software (Navision, which was chosen in part because it was already in use in one of the districts).

The connection from headquarters to the sub-counties was less straightforward, and the solutions were determined on the basis of three parameters:

1. access to a landline connection
2. access of the sub-county offices to the electricity grid
3. the distance from the sub-county to the headquarters

Four sub-counties were selected because they were not connected to the electricity grid and consequently alternative energy sources, such as solar energy panels, would be used. Overall, the programme identified five different options for data and voice communication (see table 2).

1	Land Line	An external modem is used for the data exchange	7
2	Mobile phone I	Mobile phone with data accessories and associated software	4
3	Mobile phone II	As above with additional antenna	2
4	Broadband wireless	Wireless access to HQ LAN where the sub-county is within a 15 km range and with line-of-sight.	1
5	HF radio with data comm	Radio set with antenna, power supply, modem	6

Table 2: Up-country connectivity solutions in the DistrictNet programme. The last column lists the amount of times each solution was selected in the programme proposal.

⁶ In the original programme, eight expected outcomes were defined (as described in Kintu, Mbeine, 2004), but some of them showed so much overlap that we have grouped them together.

⁷ In 2005 the number of districts was increased from 52 to 76 by "local governmental reorganization"

3.3 Implementation of DistrictNet

The implementation of DistrictNet was designed as a pilot programme to prove the concepts and to build a body of knowledge. IICD supported the formulation and implementation of the programme via research, strategic advice, capacity development (in ICT skills and soft skills) and general programme management.

At the start of the programme, there was virtually no experience with the use of ICT at local government levels. Some ICT programmes had been implemented in Uganda, but all at the central government level. Of course, the programme was aligned with the plans of the Uganda Communications Commission (UCC), the regulator in Uganda, to spread Internet connectivity to District centres, and with those of the Local Government Development Program (LGDP-I) to restructure government structures to better address the national goals of economic growth and poverty alleviation.

The implementation plan of the programme can be characterized as "phased" (Shelly et al, 2001) but executed simultaneously at four locations (i.e., the four districts). The whole programme plan - from design, through procurement, implementation, training and evaluation - was expected to take one year. However, although it was projected to start in May 2002, the programme did not take off until February 2003. At the time of writing, the pilot phase is about to be finalized.

Soon after the programme's kick-off, the ICT infrastructure implementation began. Local Area Networks (LAN), email and internet services were purchased and installed to establish the first connectivity between the offices in the Headquarters and between the Headquarters and the offices in the sub-counties.

The implementation of the ICT infrastructure in the four districts did not move at the same pace in each. As expected, implementation in the Kayunga district, because of the specific challenges caused by the district's geographical location, initially moved more slowly than in the other locations.

Parallel to the implementation of the ICT infrastructure, the Chief Administration Officers (CAO) and their staff of administrators in the districts embarked on the evaluation, improvement, and redesign of processes. The starting point for the evaluation was the need to increase access to *relevant* and *timely* information in the district headquarters and between the headquarters and the sub-counties.

3.4 DistrictNet and E-administration

At the start of the programme, the basic data was collected at parish level and forwarded to sub-county administration. The sub-county's responsibility was to collect and compile all data from the parishes, and then forward it to District HQ. Then, the District HQ, like the sub-county administration, checked the data for completeness and forwarded it to MoLG, where digital recording took place. All data was in hard-copy form, and was physically transported by road. In order to ensure uniformity, standardized forms were used at all levels. The process is depicted in figure 3.

Several problems occurred in this process. In the first place, the data which was collected at the parish level took a long time before reaching District HQ and MoLG. We observed information backlogs of three to six months. Secondly, data was lost in transport, never reaching the District HQ and MoLG, for reasons that were not very clear.

Indeed, some data was never collected properly in the first place. For example, in one district less than 20% of the information required for budget and planning reached the MoLG. This implied that in 80% of the sub-counties, the planning and budgeting process was seriously undermined. These two problems guided the programme design.

Currently, the basic data is still collected at the parish level and forwarded to sub-county administration using the same hard-copy standard forms. The first change was implemented at the sub-county level: the eleven pilot sub-counties are now responsible for the digitization of data. After digitizing the data and checking its completeness, the sub-counties then forward the data via email and/or floppy disk to District HQ, resulting in a timely delivery of the data needed for planning and budgeting purposes.

The third change was implemented at District HQ, where District Planners (who were trained to use data analysis tools) now perform data analysis and provide timely feedback to the sub-county administration

and the parishes.

A fourth change is in the improvement in lead times for the data's arrival at MoLG, as the four pilot districts are now able to transfer their information electronically to MoLG. Moreover, MoLG can now work much more efficiently and effectively because it is no longer responsible for digital recording, thus allowing more time for analysis and informed decision-making. The process is depicted in figure 3.

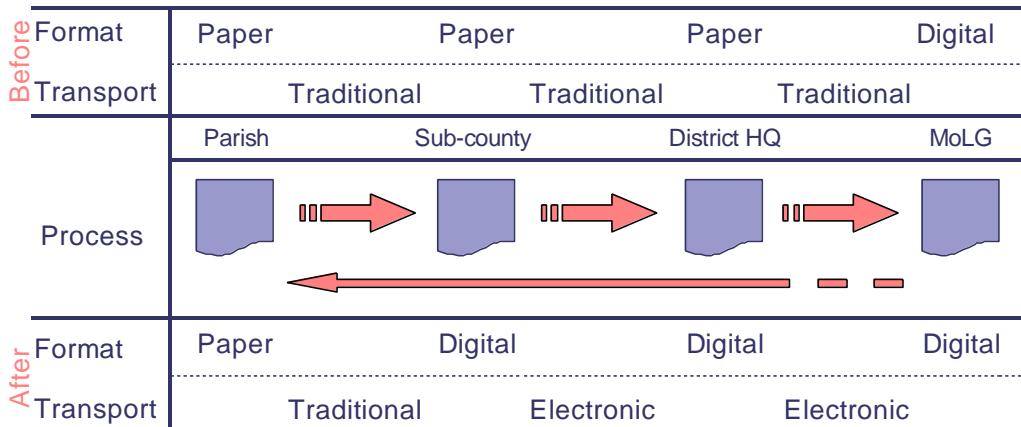


Figure 3: Business process improvement in DistrictNet

In the reverse feedback flow, the decision was made to send relatively little information, using low-end tools, to provide feedback from MoLG to the District HQ and from District HQ to lower local government levels. This feedback mechanism enables lower-level governments to finalize their planning and budgeting processes. This process still needs (and deserves!) further development, and much more staff training is required. However, at this stage we can say that the system is a unique example of e-administration and e-services for East Africa, and it has had an enormous impact on the government planning in the four pilot districts. The support for decentralization supported through ICT's deserves further documenting and dissemination.

3.5 DistrictNet and E-services

Efforts to offer direct information services to the citizens of the four pilot districts began in 2004. In this respect it should be mentioned that Uganda is a strongly decentralized country, which is a "disadvantage" for implementing e-services in that most governmental information services (e.g. business licenses, tax forms and information) are already available to the citizens in hard-copy form at the sub-county level. As a result, offering these types of services in electronic form is not among the programme's direct priorities.

Nevertheless, since 2004 various districts have piloted a programme offering electronic information services on business licenses, land registration, and tax revenues. In 2006, after two years of these pilots, the IICD will establish a research project to analyze which user groups are in need of what type of information services. The challenge at this level of services is to create information outlets at the sub-county level in the districts, in order to provide citizens with relevant data such as market and price information for agricultural commodities.

3.6 DistrictNet and e-Society

E-society was and is not within the scope of the programme. DistrictNet was to focus on e-administration and e-services. As a result, this domain has been neither developed nor evaluated.

3.7 Challenges and obstacles

The implementation of DistrictNet was considered a major challenge from the start. Although there were some experiences with a similar implementation of e-Governance at a local level in the Kinondoni Municipal Council in Dar es Salaam in Tanzania (Menda, 2005), the rural locations of the four pilot districts and the scale of the project posed some new and unexpected problems.

In the implementation phase, the importance of large-scale continuous capacity development became immediately apparent. The levels of professional technical ICT knowledge (i.e., the knowledge to implement an ICT infrastructure) as well computer literacy (the ability to operate the computer and its applications, as well as awareness of the opportunities ICT creates in organizations) proved to be lower than anticipated. When combined with the huge staff turn-over in local governments, this circumstance demanded the establishment of continuous training programmes at the District HQ. In addition, the implementation of the ICT infrastructure began slowly, and the implemented solutions were inadequate. This problem was caused in part by the fact that the Districts themselves did not take up ownership of the programme until May 2005, when it was decided to make the districts directly responsible for implementation. This shift in responsibility improved the quality of implementation greatly.

Another problem was that DistrictNet faced significant delays in the implementation of e-services because of a strong technological focus at the start of the programme. Decisions needed to be taken on the type of hardware, software and network connections that were suitable in the programme's rural context. Not until the discussions on the type of technology to be used were concluded could the project proceed to the level of e-services.

The first years of the programme were dedicated to enabling e-administration and e-services. Because of the battles over defining which technologies were needed in the programme's rural settings, the services offered by the DistrictNet programme remained for quite some time focused on e-administration. In 2006, though, these technology fights are consuming less energy, and therefore the programme should develop increasingly in the area of e-services.

4. Conclusions and Lessons Learned

DistrictNet is a complex and rich programme that can serve as a reference / learning model for other e-governance programmes in a development context. In this last section we will apply the theoretical framework presented in section 2 in order to evaluate the level to which e-governance has been implemented in the programme. On the basis of the evaluation, we will formulate some lessons learned that can guide other e-governance programmes at local government levels.

4.1 e-Governance implemented

In section 2, we developed a matrix to determine the focus of e-governance and the level to which the processes in the organization are affected. We postulated that meaningful e-governance programmes optimize the processes of the government and human and societal development. In order to evaluate whether this has taken place, the three focus areas of e-governance (e-administration, e-services and e-society) need to be considered, as do the levels to which the government processes are automated, improved or redesigned (BPA, BPI and BPR). What can we conclude for the DistrictNet programme in Uganda?

The design of DistrictNet allows the programme to extend in all three areas of e-government, supporting the processes at the local and sub-country levels by offering new services for the citizens, and by creating the conditions for the eventual involvement of business communities and non-governmental and community organizations. The programme is designed not only to automate the existing processes, but also to emphasize the improvement of processes. For instance, the budgeting and planning processes underwent radical improvement. The old budgeting and planning processes have been re-structured and optimized, and the new processes have created dramatic improvements in efficiency and effectiveness, thanks to the use of ICT. Similar positive results were recorded for the information sharing of the sub-counties with the Chief Administration Officer and District Planner.

Most of the initiatives were problem driven. Hence, the programme has so far had very little space for e-society initiatives. Some actions for e-society were integrated in the development of a new communication structure for information sharing through the newly established websites (each of the pilot districts has a website offering generic information about the district).

The programme has had the most impact at the e-administration and e-services levels. The programme was able to optimize and, where possible, restructure processes in these two areas of e-governance. However, the programme has so far not been able to re-design processes at the e-services level. The results of the programme are plotted in figure 4.

e-Governance development			
e-Society			
e-Services	+	+	
e-Admin	++	++	
	BPA	BPI	BPR

Figure 4: The extent to which the focus areas of e-government were implemented in DistrictNet

4.2 Lessons Learned

To conclude this paper, we want to elicit some lessons learned from the DistrictNet programme in Uganda. We focus our lessons through the three main categories identified in the United Nations' *World Public Sector Report 2003*. In addition to the points raised in the UN report, we identify six new lessons in three categories:

1. Focus of ICT in government operations
 - Think big, but begin small

- Create feedback loops in e-governance programmes

2. *Ability to use ICT in government*
 - Stress capacity development as a key success factor
 - Recognize that fighting technology takes time
3. *Strategies for connecting citizens*
 - Emphasize that information is a commodity
 - Ensure content availability and usage

The six lessons are explained in the three categories below.

Ad 1. Focus of ICT in government operations

DistrictNet presents a good example of embedding the introduction of e-government in the larger context of priority development needs in a country (in this case, the government's decentralization programme). As DistrictNet shows, e-governance programmes are complex and need constant attention and care. Improvement in efficiency and effectiveness may be important at a national level, but at an individual level it can also be considered as a threat and thus a reason to resist or even undermine the programme. However, the programme is most likely to achieve good results (i.e. improvements in efficiency and effectiveness) and constant attention and support when it is part of the success of high priority development programmes in the country, and where results of individuals are benchmarked against national development goals.

Think big, but begin small

Gradual and phased implementation of the programme is the key to success. In other words: Think big, but begin small. DistrictNet has been designed as a pilot programme. The main goal was to build knowledge and gain experience. New programmes should build on these experiences because the underlying idea of the pilot is to create a nation-wide e-governance network. It is important to integrate this goal in the design of the next phases of this pilot programme.

Create feedback loops in e-governments programmes

In countries like Uganda, civil servants at the local levels are often asked to gather data but seldom receive feedback on the impact of their data-collecting activities. A good feedback mechanism in an e-governance programme creates a tool to provide the local levels with information, and the improved information position of the officers at the local government levels enhances their commitment to the introduction of e-governance.

Ad 2. Ability to use ICT in government

Our observations from the DistrictNet programme show that in a development context the ability of local governments to design, implement, use and maintain e-governance in action should not be overestimated. This might be an important difference with e-governance programmes in the developed world. Training and capacity development is key to the success.

Stress capacity development as a key success factor

Five types of knowledge and skills are necessary for successful ICT implementation, as well as sustainable e-governance:

1. Professional technical knowledge to implement and to maintain the technical infrastructure
2. Professional business knowledge to guide and check the quality of the suppliers implementing and maintaining the technical infrastructure (tendering, quality control, Service Level Agreements)
3. Computer literacy at the government level, such as basic knowledge about how to operate the computers and their applications, and an understanding of the role ICT can play in the improvement of work processes
4. Computer literacy among users, such as basic knowledge about how to operate the computers and e-government applications
5. ICT change management skills among management and administrators

Professional knowledge may be available in the country; however, this knowledge is less likely to be found at the level of the local governments, and is seldom found in the rural areas. As a result, obtaining quality ICT consulting services is difficult. Computer literacy is often defined as the ability to use office

applications; however, e-governance programmes also demand that staff have a good understanding of the role that ICT can play in their organization and in their work. In the developing world, the level of computer literacy among the people in the rural areas is extremely low (see also table 1). Consequently, in the design and implementation of an e-governance programme, one cannot assume any level of computer literacy. Training in the programme should focus on developing the skills to operate and maintain the applications used in the e-governance programme, as well as on educating people about the possibilities of ICT for government operations. When ICT solutions are outsourced, business-related skills such as supplier and contract management are vital, since the quality of service of ICT suppliers in rural environments is often low.

Training should not be purely technology-driven or organization-focused. In a rural setting, the introduction of ICT does not automatically lead to the use of the new tools. Resistance, fear and lack of understanding need to be managed carefully and skillfully to persuade the users to use the new ICT. Training can serve as a tool to change the attitudes of users in the organization. It is advised that the training simulates the day-to-day working practice as anticipated in the desired situation.

Training should not be limited to the borders of the organization, but should also include community leaders and potential champions in the communities. Their role is vital for carrying knowledge to the surrounding communities.

Recognize that fighting technology takes time

In DistrictNet's initial stage of implementation, the primary focus was on developing the ICT infrastructure to enable e-administration and e-services. Often in e-governance, the primary focus is on these technical aspects, and the organizational and social aspects are treated with less priority. It takes time to change this technology-focused attitude, and the issue needs to be addressed from the start of the implementation process.

Ad 3. Strategies for connecting citizens

Connecting the citizens to the programme is probably the biggest challenge, especially with the local government in rural areas. One of the reasons for the success of DistrictNet is that it has been using traditional means combined with modern (ICT-enabled) strategies to distribute information to the citizens. In the excitement of the introduction of new technology, programmes tend to forget to include the traditional means for information distribution, such as radio, television, bulletins, bulletin boards, and even word-of-mouth. The traditional communication channels are the first ways to make use of the new ICT-based communication channels.

In Uganda, as in many parts of Africa, mobile telephony is gaining rapid acceptance as a means of spreading information (see, for example, the wide range of information services offered through SMS). The reach of mobile telephony has increased dramatically in recent years and has penetrated deep into the rural areas of Africa (Scott et al, 2004). The design of DistrictNet could benefit from a closer integration of mobile telephony with the ICT-enabled solutions. The spread of information to citizens through a special (free) SMS service could have increased the e-services dimension of the programme.

Emphasize that information is a commodity

The success of e-administration and e-services programmes relies heavily on the quality of data and information. The availability of quality data and information is too often taken for granted. Programmes must remember that information is a commodity:

- The quality of data should be monitored, while the quantity of data at higher levels has to be reduced
- Information is not "just lying around"; it should be derived from the right datasets. Therefore, lobbying at all levels, and especially at the political level, is needed to ensure that the necessary data can be collected and used.
- Incentives should be in place for data generation at lower local government levels (e.g.: Direct outlets of data should be present at the level at which the data is being collected).

The DistrictNet project taught us that potential users can be trained in using the services offered and that the staff members of the project can be trained in basic ICT applications, project management, and financial management. At the operational level, the rule that "people learn when they see how they can use their skills and knowledge" was proved valid once again.

The difficulty is in training the staff members how to use the data at a more strategic level, so they can

transform the data into useful information and knowledge. Thus, two critical factors in good governance programmes are the creation of information flow procedures and the development of solid training programmes in information management.

In DistrictNet, an information flow toolkit for Information Officers at Higher Local Government Level was provided during training sessions. The kit was developed in a participatory way.

Ensure content availability and usage

The availability of information is key to keeping momentum in an e-governance programme, and the way the users employ this information is the measurement for success. Access to information, and thus the success of ICT projects, is determined by:

1. *Awareness*: Do the potential staff members and end-users know the services exist?
2. *Connectivity*: Are the services and information available?
3. *Affordability*: Can government administration and the citizens afford the access to the information without external financial support?
4. *Capability*: Have the potential users and the staff members of the project the skills required for access?
5. *Sustainability*: Will similar services be available in the (near) future?

DistrictNet experiences show that the content needs careful management in order to keep citizens attached to the project. We have noticed that centralized management of local information does not work, as the information is not in line with the local needs and is often outdated or arrives too late to be useful.

4.3 Conclusion

DistrictNet has created a wealth of experiences and provides a rich model of reference for other e-governance programmes in Africa. The programme is a showcase of what e-governance in rural areas can look like. New technologies have been introduced and tested, and the programme has provided evidence that the introduction of ICT at the local government level can lead to major improvements in performance. At the same time, the programme shows that the low penetration of ICT skills and equipment in countries like Uganda limits the way such initiatives can move into e-administration and e-services, and makes e-society unreachable for the moment. Governments need to continue their efforts to develop ICT infrastructure and to increase the penetration of ICT skills among their citizens, especially concentrating their efforts on the rural areas, while development partners should establish more research programmes to ensure the successful implementation and support of ICT.

Annex I Local government administrative structure in Uganda

Functions	Local councils	Level
<p>Local government</p> <ul style="list-style-type: none"> - exercise all political and executive powers - provide services - ensure the implementation and compliance with government policy - assume planning power for the district - enact district laws - monitor performance of government employees - levy, charge and collect fees and taxes - formulate, approve and execute district budgets 	LC 5	District Composed of 3 to 5 counties
<p>Administrative unit</p> <ul style="list-style-type: none"> - advise district officers and area member of parliament - resolve problems and disputes - monitor delivery of services 	LC 4	County Composed of 3 to 5 sub counties
<p>Local government</p> <ul style="list-style-type: none"> - enact by-laws - approve sub-county budget - monitor performance of government employees - levy, charge and collect fees and taxes - formulate, approve and execute subcounty budgets 	LC 3	Sub-county Composed of 3 to 6 parishes
<p>Administrative unit</p> <ul style="list-style-type: none"> - assist in the maintenance of law, order and security - initiate, encourage, support and participate in self-help projects - serve as communication channel - monitor the administration and projects 	LC 2	Parish Composed of 3 to 15 villages
<p>Administrative unit</p> <ul style="list-style-type: none"> - assist in the maintenance of law, order and security - initiate, encourage, support and participate in self-help projects - recommend persons for local defence units - serve as communication channel with government - monitor the administration and projects - make by-laws - impose service fees 	LC 1	Village Composed of 10 to 60 households

Figure 1: Local government administrative structure

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On IICD

The International Institute for Communication and Development (IICD) was established in 1996 with the objective to assist developing countries to keep up with the latest trends in Information and Communication Technologies (ICTs). On one hand we do that by maintaining a website (<http://www.iicd.org>) which features, amongst others, a Service Desk where people from developing countries can ask questions about ICTs and development. On the other hand we hold ICT Roundtable Conferences in nine developing countries, during which the participants (all local) set ICT priorities and develop project ideas. IICD then continues to assist in project formulation and in search for financial resources. Currently about 100 projects are in implementation in the sectors education, governance, livelihood opportunities (mainly agriculture), health and environment ranging from Telemedicine projects to Crop marketing bureaus.

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