

E-Governance in the developing world in action the case of District Net in Uganda

VICTOR VAN REIJSWOUD

PROFESSOR OF INFORMATION SYSTEMS AND E-COMMERCE, DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION SYSTEMS, UGANDA MARTYRS UNIVERSITY, NKOZI IN UGANDA

ARJAN DE JAGER

COUNTRY MANAGER FOR UGANDA, THE INTERNATIONAL INSTITUTE OF COMMUNICATION AND DEVELOPMENT IN DEN HAAG, THE NETHERLANDS

Abstract

E-Governance is a powerful tool to bring about change to the government processes in the developing world. E-governance operates at the cross roads between Information and Communication Technology and government processes and is divided in three overlapping domains: e-administration, e-services and e-society. In order to be successful, e-governance needs to be firmly embedded in the existing government processes, needs to be politically and technically supported by the governments and provide users reasons to go on-line. 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 Uganda – East Africa. The programme, DistrictNet, tries to provide transparency at a local government level and 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 against three domains of e-governance and the impact on the government processes. On the basis of the evaluation we elicit lessons learned to guide similar programmes at the local government levels in the developing world.

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 provide a start to 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. International pressure by donors and governments in the developed world force governments to increase transparency, decrease corruption and participate in global digital information sharing. On a national level, the private sector demands from the governments more openness and willingness to participate in transparent relationships. Citizens request governments to provide better, faster services and extend their information and service offerings to the rural areas. 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 Nation, 2003). ICT allows a government’s internal and external communication to gain

speed, precision, simplicity, outreach and networking capacity. This can be converted into cost reductions and increased effectiveness – two desired features of all government operations, but especially of public services. It can also be converted into 24/7 usefulness, transparency and accountability, networked structures of public administration, information management and knowledge creation in public administrations. In addition, it can equip people for genuine participation in an inclusive political process that can produce well-informed public consent, the ever more prevalent basis for the legitimacy of governments.

This paper reports on the experiences of DistrictNet, an ongoing e-governance programme in Uganda, East Africa. 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 starts with a theoretical background on e-governance. This background is important to better understand the objectives and design of the DistrictNet programme. In section 3 we present the programme, its start and the achievements so far. In section 4 we evaluate the programme in a larger context and elicit lessons learned.

Understanding E-Government

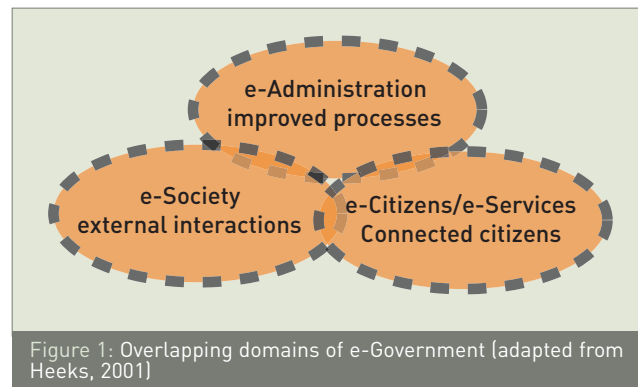
The work of governments is reshaped by two ineluctable trends. The first is the movement away from centralized, vertical and hierarchical government machines towards polycentric networks of governance based upon horizontal interactions between diverse actors within complex, multilayered societies. The second trend is rapid introduction of ICT aiming 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. In other words we need to transcend from the understanding of ICT as mere technology. We continue to identify types of e-governance and egovernment, describe the status of e-governance in the world and conclude with guidelines for successful e-governance programme design and implementation.

ICT for change

Information and Communication Technology are important initiators and drivers of change in an organization. Through the use of ICT, new things are possible and ultimately ICT will reinvent organizations and their services (Leer, 2000). Dennis and Haley Wixom (2000) identify three strategies to 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. This means for example that 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. To goal of BPI is to reconsider the processes and information and improve them by introducing some moderate changes that are generally incremental or evolutionary in nature. The new practice is enhanced through both making the users more efficient but also by changing what they do to make them more effective. In a practical situation this means that processes are examined carefully to see whether existing problems can be eliminated as part of 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. A fundamental and critical rethinking of the processes of an organization is considered the goal of BPR. In the light of the introduction of new ICT, the organizational processes are evaluated, changed or eliminated and new processes are added in order to improve the performance in terms of costs, service delivery, quality of speed. In the development



context we observe in many e-governance programmes a focus on first time introduction of ICT. This opens up new horizons and allows organizations to deliver new ICT-enabled services that have never been able before. It is important to realize that BPR as described here 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. They are general concepts of increasing the efficiency and effectiveness of organizations. Although not essential, nowadays, ICT is at the heart of most of these initiatives.

Domains of e-governance

Quoting Ntiro, Heeks (2001) identifies three main domains of e-governance:

1. e-administration: improving government processes;
2. e-services²: connection individual citizens with 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-services initiatives mainly focus at improving the relationship between the government and their citizens through increasing the information flows between government and citizens and improving the service levels of government towards its citizens. It is important to note that these initiatives are founded in two-way communication between the government and their "clients". We speak of e-services when public service

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

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

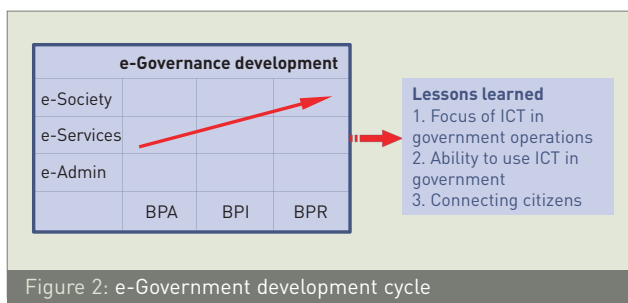


Figure 2: e-Government development cycle

institutes offer their citizens, for example, the possibility to apply for business licences through a government website. E-society initiatives extend on the the previous e-services domain by focusing on institutional stakeholders (private sector service providers, other public agencies, notfor-profit and community organizations). It also extends in that the focus is on building long lasting partnerships and social/economical communities. For example the creation of a business community portal is an example of the implementation of e-society. In their implementations, the three domains of e-governance are seldom separate, but overlapping activities in the same initiative. To put it stronger: good e-governance programmes take into account the three domains.

Where is e-governance now?

The United Nations World Public Sector Report 2003, provides three main conclusions about 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, according to 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. Developing countries must contend with limited financial resources and human capital while trying to develop sufficient ICT infrastructure, build overall educational and technological skills, and afford widespread on-line access to rural areas and other under-served populations.

In describing the methodology for their 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 UN report are first, that developed and developing governments have made little use of on-line transaction services and second, 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 for developing countries to pursue their e-governance strategies through practical, innovative applications.

Guiding principles for successful e-governance

In their report on the status of e-government, the United Nation department of Economic and Social Affairs distinguishes guiding principles for success from the reasons for governments as well as users to go and stay on line (United Nations, 2003). The guidelines for successful e-governance are grouped in the three categories:

- reasons for governments to use ICT in their operations and to go on-line;
- ability of governments to use ICT and to go on-line;
- 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:

- **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 brings broad support and makes it easier to overcome inherent difficulties and sustain attention, commitment and funding.
- **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 continued development of e-government. Ability of the government to use ICT in its operations: to go and stay on line.
- **Availability of (initial) funding.** Even initial pilot e-government operations should start with a good understanding of costs involved and assured funding that follows careful analysis of opportunity cost. Whenever advisable and feasible, funding should be treated as a business investment and carry expectation of returns.
- **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 that e-government application can bring to individual civil servants and, eo ipso, the eventual strength and effectiveness of the anti-change lobby (if any).
- **Co-ordination.** Needed “backroom” co-ordination and effort - within and between government agencies - must be ironed out before any e-government application goes on line to avoid duplication, assure interoperability and meet the expectations of users.

- **Legal framework.** E-government introduces unique legal requirements and these should be realized and faced early on.
 - **ICT infrastructure.** Infrastructure needs should be assessed against the background of requirements and desired results of planned e-government development. Anything short of this limits both. Anything that goes beyond this carries the danger that ICT infrastructure will be converted into expensive and idle office equipment.
 - **Political leadership and long-term political commitment.** The chief executive officer of the public sector must be committed to e-government, lead and build broad support for it, and be eager to learn. This generates the all-important positive signals that the civil service needs to receive from its top leadership.
 - **Public engagement.** The public should have a personal stake in e-government development. This 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.
 - **Plans for development of human capital and technical infrastructure.** There should be a vision and plans for closing the existing divides in skills and access. Otherwise, neither the public administration nor the society can hope to become ICT literate and capable - important ingredients for e-government success.
 - **Partnerships.** Early on, the government should see 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. Partnerships should never be forged at the cost of transparency, accountability or economic soundness of investments.
 - **Monitoring and evaluation.** Setting clear responsibilities and realistic benchmarks for e-government development, as well as for their transparent monitoring, is an important ingredient for eventual success and builds up the overall transparency and accountability framework in the public sector.
- Compelling reasons for the *users* of e-government to go and stay on line:
- **Perception of added value.** Any design of e-government development must incorporate a calculation of the added value that the application intends to bring to individual users. It is best if this calculation proves to be congruent with that of the users.

³DistrictNet programme proposal dated 11th February 2002.

⁴The 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).

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

⁶In the original programme 8 expected outcomes were defined (as described in Kintu, Mbeine, 2004), but some of them showed so much overlap that we have grouped them together.

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

National indicators Uganda	
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

Table 1: National indicators of Uganda. In: Tsubira et al., 2005.

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.

- **Access and skills.** It should be made easy in terms of time, cost and effort for the potential users of e-government to actually employ 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, individual access and skills.
- **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 bound to expect a breakdown in this area and any news (even informal) of one is bound to become a huge setback with long-lasting consequences.

Model for Evaluation

It is important to evaluate the performance of e-governance programmes in the developing world. Limited and often temporary funding require governments to implement the 'first time right'. Most of the evaluations are quantitative and founded in the ontological tradition of science, like the longitudinal survey published in the World Public Sector Report of the United Nations (2003) and or the work on e-governance and e-commerce of the Institute of Development Policy and Management (see e.g.: Heeks, 2001, Molla, 2004). Little qualitative and epistemological studies on e-governance have been reported.

In the current 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 set up (Argyris et al, 1990, Baskerville, 1999). DistrictNet is analyzed along the lines of the theoretical framework presented above:

1. the focus of the programme (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. Figure 2 below can be regarded as 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 point above and is used to guide the identification of the “Lessons Learned”.

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 “wasteful” and e-governance that does not have any of very limited impact on the development objectives of the country at large “pointless”.

DistrictNet – Uganda

Over the past 15 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 usage of Internet is low (see National Indicators in Table 1). It is against this background that the District Administration Network programme (DistrictNet) started in 2002. The general aim to improve transparency of local government and improve provision of public information through the implementation of ICT (Weddi, 2005). So one can state that the programme was focusing initially on supporting E-administration and the possibilities of Eservices 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. The programme was – up to May 2005- fostered by the Ministry of Local Government and initial investments and running costs were financially supported by IICD in conjunction with the Ministry of Local Government (MoLG) of Uganda.

Set Up of DistrictNet

The idea for DistrictNet emerged from a roundtable conference⁴ organized by the International Institute for Communication and Development (IICD) in March 2001. The workshop was themed “ICT for Rural Development” and brought together participants from rural and upcountry institutions in public and private sectors. During the workshop following problems were identified at the district and sub-county local governments⁵:

1. Lack of convenient mode of communication between the district and the lower local governments, leading to poor follow-up and coordination of activities, which result in delays and inaccuracies
2. Record keeping of a variety of data and information, including council minutes and statistical data is paper based, resulting in records being lost and those available, in a form that makes it difficult to find and share information
3. Financial records are maintained and processed manually, and are often not up-to-date, inaccurate, and leading to less transparency and accountability
4. A large number of reports have to be prepared and submitted from lower local governments to the district, and

from the district to central government ministries. Currently the reports are prepared manually, leading to slow and often inaccurate processing of the reports

5. Limited access to information on government policies; planned and ongoing programmes/programmes by government, donors and NGOs; general development information on agriculture, health, etc

In order to address these problems the introduction of ICT at the district and lower local government levels was proposed. Emphasis was put on data and voice communication between the district headquarters and the pilot sub counties and the introduction of an integrated information system for storing, analyzing and managing of financial information. Based on an analysis of the needs in the Districts and the possibilities of ICT, the programme aimed to achieve 5 overall goals⁶:

1. Increased availability of management information, measured by the time needed for sub-counties to answer queries of 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 movements of 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 board, radio, and website, as well as the amount of information requests by the citizens and the number of queries answered
- The DistrictNet programme was initially designed to be implemented in four of the 767 districts in Uganda (Mbarara, Lira, Mbale and Kayunga) covering the countries west, north, east and central regions. Uganda consists of 76 districts which are further sub divided in sub-counties and parishes. Moreover the selected districts needed to be characterized by long-term political commitment. This spread of the programme was chosen to provide a base for an evolutionary growth of the programme based on the premises that pilot districts would inform neighboring districts about their achievements in the end leading to regional capacity development. Within the four districts the programme selected 11 sub-counties (there are over 900 sub counties in Uganda). Kayunga district was selected because of its unique challenges caused by its remote location.

Proposed technical solution

The proposed technical solution envisaged to realize DistrictNet was mostly simple and straightforward. To improve the communication between the offices in the district, voice and data communication links needed to be set up to connect all the offices in the district headquarters. Some of the offices are as far as two kilometers apart. A client-server based Local Area Network (wired and wireless) was to account for the communication in the headquarters. Within the headquarters the 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), GIS (Geographical Information System) software (Arcview) and financial software (Navision). The choice for implementing Navision was guided by the fact that there are already some experiences with the software in one of the districts.

The connection from headquarters to the sub-counties was less straightforward. The solution was 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

A number of four sub-counties -all of them not connected to the electricity grid- was selected on purpose since they were and alternative energy sources such as solar energy panels were to be used.

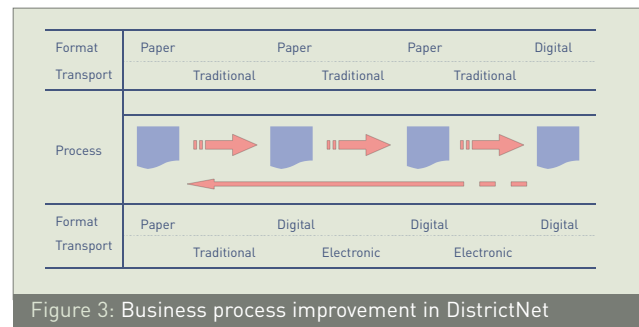
In the programme 5 different options for data and voice communication were identified (see table 2). The last column lists the amount of times the solutions was selected in the programme proposal.

Implementation of DistrictNet

The implementation of DistrictNet was designed as pilot programme to prove the concepts and to build a body of knowledge from its actual implementation. At the start of the programme there was virtually no experience with the use of ICT at local government levels. In the country were some ICT programmes being implemented, but all at central government level. Of course, the programme was aligned with the plans of UCC (Uganda Communications Commission, the regulator in Uganda) to spread Internet connectivity to District centres and the Local Government Development Program (LGDP-I) to restructure government structures to provide a better answer to the national goals of economic growth and poverty alleviation.

The implementation plan of the programme can be characterized as a phased implementation (Shelly et al, 2001) but executed simultaneously at four locations (districts). The whole programme plan from design, through procurement, implementation, training and evaluation was expected to take one year. Although it was projected to start in May 2002, the programme finally took off in February 2003. At the time of writing the pilot phase is about to be finalized. Soon after the kick-off of the programme the implementation of the ICT infrastructure started.

Local Area Networks (LAN), email and internet services were purchased and installed to the 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 was not moving at the same pace. As expected, Kayunga district, because of its specific challenges caused by the geographical location moved initially slower than the programme 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 and improvement/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.

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 responsibility was to collect and compile all data of the parishes. After the collection of the data it was forwarded to District HQ. Like the sub-county administration the District HQ checked the data for completeness before forwarding to MoLG. Digital recording took place at MoLG. All transport of data took place in hard-copy form 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 parish level took long before reaching District HQ and MoLG. We observed information backlogs of 3-6 months. Secondly the loss of data. Some of the data never reached the District HQ and MoLG. The reason not being very clear. Some data was never collected and some data got lost during transportation. For example in one District less than 20% of the required information reached the MoLG. This implied in 80% of the sub-counties the planning and budgeting process was undermined. These two problems guided the programme design. Currently the basic data is still collected at parish level and forwarded to sub-county administration using the same hard-copy standard forms. The first change was implemented at sub-county level: The 11 pilot sub-counties are now responsible for the digitization of data. After digitization and checking the completeness of data the sub-counties forward the data via email and/or floppy disk to District HQ resulting into timely delivery of the data needed for planning and budgeting purposes.

The third change was implemented at District HQ where District Planners (who were capacitated to use data analysis tools) can do data analysis and can give timely feedback to the sub-county administration and parishes.

Change number four is the improvement in lead times for the data to arrive at MoLG: The four pilot districts are now able to transfer their information electronically to MoLG. Moreover: MoLG can work much more efficiently and effectively because the step of digital recording can be skipped allowing more time for analysis and informed decision making. The process is depicted in Figure 3. In the reverse feedback flow, only -on purpose- little information

using low-end tools are used to provide feedback from MoLG to the District HQ and from District HQ to lower local government levels. This feedback mechanism enables lower governments to finalize their planning and budgeting processes. Though a lot can be commented on this process and while it still needs (and deserves!) further development and a lot of capacity development still has to take place: The system is a unique of e-administration and e-services for East-Africa and has an enormous impact on the government planning in the four pilot districts. It deserves further documenting and dissemination.

DistrictNet and E-services

Efforts to offer direct information services to the citizens of the 4 pilot districts did start up in 2004. In this respect it should be mentioned that Uganda is a strongly decentralized country with as “disadvantage” in this respect that most governmental information services (e.g. Business licenses, taxes) are already -in hard-copy form- available at the citizens at sub-county level. So the needs to offer various services in electronic way are not amongst the direct priorities. Nevertheless various districts piloted from 2004 by offering this type of information services on business licenses, land registration, tax revenues in electronic way. After two years of piloting the IICD will -in 2006- set up a research to analyze which user groups are in need of which type of information services. The challenge at this level of services is to set up Information outlets at subcounty level in the districts with relevant information for citizens such as -most likely- information services on market & price information for agricultural commodities.

DistrictNet and e-Society

The establishment of e-Society in the DistrictNet programme posed the biggest challenge. However: In fact e-society is not within the scope of the programme. The programme was to focus on e-administration and e-services.

Challenges and obstacles

The implementation of DistrictNet was considered a big challenge from the start. Although there were some experiences with a similar implementation of e-Governance at a local level in Kinondoni Municipal Council in Dar es Salaam in Tanzania (Menda, 2005), the rural setting and the scale in which the programmes in four pilot districts were located posed new and some 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. Knowledge to implement an ICT infrastructure) as well computer literacy (knowledge operate the computer and its applications as well as knowing the opportunities ICT creates in organizations) proved to be lower than anticipated. Combined with the huge staff turnover in local governments invoked a setup of continuous training within the District HQ. The implementation of the ICT infrastructure started slowly and the implemented solutions were of low standards. This was partly caused by

the fact that the Districts themselves did not take up ownership of the programme. In May 2005 it was decided to make the districts directly responsible for the implementation which improved the quality of implementation greatly.

The implementation of DistrictNet was faced with significant delays in the area of e-services because of a strong technological focus in the start of the programme. Decisions needed to be taken on the type of hardware, software and network connections that were suitable in the rural context in which the programme was executed. Not until the discussions were concluded on the type of technology used, the project could proceed to the net level of -services. The first years on the ICT infrastructure to enable E-administration and E-services. Because of the technology fights which were needed in the rural setting of the programme the services offered by the DistrictNet programme remained for quite some time focused on E-administration. Anno 2006 these technology fights take less energy and therefore it can be expected that the development of the programme will move more and more into the area of E-services.

Conclusions and Lessons Learned

DistrictNet is a complex and rich programme that can serve a reference/learning model for other e-governance programmes in a development context. In this last section we will apply the theoretical framework of section two and 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 a local government levels.

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 do so, the three focus areas of e-governance (e-administration, e-services and e-society) need to be considered and the level to which the government processes are automated, improved or redesigned. 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. The support of the processes at the local and sub-country level, the offering of new services for the citizens and the possible involvement of the business communities, non-governmental and community organizations. The programme is not only designed to automate the existing processes, but there is clearly emphasis on the improvement of processes. Processes that underwent radical improvement are budgeting and planning. The traditional processes of budgeting and planning have been re-structured and optimized, and the new processes improved dramatically in efficiency and effectiveness with 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 had -up to now- very little ground for e-society. 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 had most impact in the e-administration and e-services levels. It can be observed that the programme was able to optimize and where possible restructure processes in these two areas of e-governance. However, the programme is up to now not able to re-design processes at the e-services level. The results of the programme are plotted in Figure 4.

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 report on the status of e-government from the United Nation department of Economic and Social Affairs (United Nations, 2003). In addition to the points raised in the UN report we identify 6 new lessons in 3 categories:

- Focus of ICT in government operations;
 - Think big, but begin small;
 - Create feedback loops in e-governments programmes.
- Ability to use ICT in government;
 - Capacity development as key success factor;
 - Fighting technology takes time.
- Connecting citizens;
 - Information as a commodity;
 - Content: availability and usage.

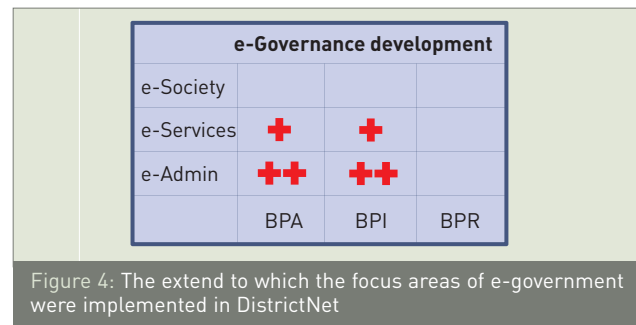
The five lessons are explained in the three categories below.

Focus of ICT in government operations

DistrictNet is a good example of embedding the introduction of e-government in a larger context of priority development needs in a country (the government's decentralization programme). We observe in the DistrictNet case that e-governance programmes are complex programmes that need constant attention and care. Improvement in efficiency and effectiveness may be important at a national level, at an individual level it can also be considered as a threat and 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 when is part of the success of high priority development program 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 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 to create a nationwide 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 requested to gather data but get seldom feedback on the impact of their data collecting activities. The creation of a good feedback mechanism in an e-governance programme creates a tool to provide the local levels with information. This improved information position of the officers at the local government levels enhances the commitment to the introduction of e-governance.

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 over-estimated. This might be an important difference with e-governance programmes in the developed world. Training and capacity development is key to the success.

Capacity development as key success factor

Five types of knowledge and skills are needed to have successful 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 – government: basic knowledge to operate the computers and its applications, and an understanding of role ICT can play in the improvement of the work processes.
4. Computer literacy – users: basic knowledge to operate the computers and e-government applications.
5. ICT change management.

Professional knowledge may be available in the country, however mostly not at the level of the local governments and seldom in the rural areas. Involving quality ICT consulting services is difficult. Computer literacy is often defined as the possibility to use office applications. However, e-governance programmes demand staff to 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). In the design and implementation of e-governance programme one cannot assume any level of computer literacy. Training in the programme should focus on the skills to operate, and maintain the applications used in the e-governance programme, but also educate people on the possibilities of ICT for the operations in the government. 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 only be technology-driven and solely 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 integrate and use the new ICT. Training can serve as a tool to change the attitude of the 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 also community leaders and potential champions in the communities should be included in the training. Their role is vital as informers of the surrounding community.

Fighting technology takes time

In the first period the implementation of DistrictNet focused mainly on the ICT infrastructure to enable e-administration and e-services. Often in e-governance the primary focus is on the 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.

Connecting citizens

Connecting the citizens to the programme is most probably the biggest challenge, especially when the local government in rural areas is concerned. One of the reasons for the success of DistrictNet is that it has been using traditional means combined with modern (ICT enabled) means to distribute information to the citizens. In the excitement of the introduction of new technology, programmes tend to forget that to include the traditional means for information distribution like radio, television, bulletins, bulletin boards, and even mouth-to-ear. 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 a 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 over the past years and has penetrated deep into the rural areas of Africa (see for details: 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.

Information as a commodity

The success of e-administration and e-services programmes rely heavily on the quality of data and information. The availability of quality data and information is too often taken for granted. In other words: 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 around” and should be derived from the right datasets. Therefore lobbying at political level and lobbying at all levels is needed to be able to receive and use the required data.
- 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 the data is being handed in

The district net 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, financial management. At operational level the rule that “people learn when they see how they can use their skills and knowledge” was valid once more.

The difficulty is in training the staff members at a more strategic level how to use the data, how to transform data into useful information and knowledge. In short: A critical factor in Good governance programmes is the setup of information flow procedures and the training in information management.

In district net project 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.

Content: Availability and usage

To keep momentum in an e-governance programme, the availability of information is key and the way the users use it the measurement for success. Access to information and thus the success of ICT projects is determined by:

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

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

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 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 put a limitation to programmes moving into e-administration and e-services and make e-society unreachable at the moment. Governments need to continue their efforts to increase the penetration of ICT skills and infrastructure among their citizens and concentrate in their effort on the rural areas while development partners should set up more research. □

References

- Argyris, C., Putnam, R., McLain Smith, D., *Action Science: Concepts, Methods, and Skills for Research and Intervention*. Jossey-Bass, San Francisco, 1990.
- Baskerville, R., Investigating Information Systems with *Action Research*. *Communications of the Association of Information Systems*, Vol. 2, Article 19, 1999.
- Bitwayiki, C., de Jager, A., Building Capacity for Embedding: The DistrictNet Uganda Programme. IICD, 2004. (capacity.org-2004; download available at www.capacity.org and www.iicd.org).
- Coleman, S., African e-Governance: Opportunities and Challenges. Commission for Africa, 2005. (download available at www.commissionforafrica.org).
- Dennis, A., Haley Wixom, B., *Systems Analysis and Design: An applied approach*. Wiley, New York, 2000.
- Hammer, M., Champy J., *Reengineering the Corporation: A manifesto for business revolution*. HarperCollins, New York, 1993.
- Heeks, R., Understanding e-Governance for Development. I-Government Working Papers No. 11. Institute for Development Policy and Management, University of Manchester, 2001a. (download available on www.man.ac.uk/idpm)
- Heeks, R., Building e-Governance for Development: A Framework for National and Donor Action. I-Government Working Papers No. 12. Institute for Development Policy and Management, University of Manchester, 2001b. (download available on www.man.ac.uk/idpm)
- IICD., The ICT Roundtable Process: Lessons Learned from facilitating ICT-Enabled Development. International Institute for Communication and Development, The Hague, 2004.
- Kintu, M.J.R., Mbeine, E., Output to Purpose Review DistrictNet Uganda. FIT Uganda, 2004 (download available at www.iicd.org).
- Leer, A., *Welcome to the Wired World: Tune in to the Digital Future*. Pearson, Harlow/London, 2000.
- Menda, A., Computerising Local Government in Tanzania: The Kinondoni Experience. iConnect Online, 2005. (www.icconnect-online.org)
- Molla, A., The Impact of eReadiness on eCommerce Success in Developing Countries: Firm Based Evidence. Development Informatics Working Papers No. 18. Institute for Development Policy and Management, University of Manchester, 2001. (download available on www.man.ac.uk/idpm)
- Scott, N., Batchelor, S., Ridley, J., Jorgensen, B., The Impact of Mobile Phones in Africa. Commission for Africa, 2004. (download available at www.commissionforafrica.org).
- Shelly, G., Cashman, T.J., Rosenblatt, H.J., *Systems Analysis and Design*. Course Technology/Thomson, Boston, 2001.
- Tusubira, F.F., Kaggwa I., Ongora J., Uganda. In: Gillwald, A., Ed. Towards and African e-Index: Household and Individual ICT Access and Usage across 10 African Countries. The LINK Centre, Wits University School of Public and Development Management, 2005.
- United Nations, World Public Sector Report 2003: E-Government at the Crossroads. United Nations, Department of Economic and Social Affairs, New York, 2003.
- Weddi, D., Transforming Local Government: E-Governance in Uganda. iConnect Online, 2005. (www.icconnectonline.org)