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ICT Framework for Service Delivery in Uganda's Local Governments

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ABSTRACT

Information and Communication Technologies' (ICT) in this study was used in its broadest sense to refer to a variety of tools, all of which make it possible to improve the management of information and improve dialogue between individuals and groups. The study took place in Tororo district with an aim of investigating the effect of ICT adoption on service delivery. This involved establishing the ICT literacy levels, examining the service delivery mechanism, determining the relationship between ICT and service delivery and proposing a framework for ICT adoption in Uganda's Local Government. The qualitative and quantitative research approaches were used. The former was used to investigate the service delivery mechanism in Local Government, ICT literacy levels, while the latter method was used to establish the relationship between ICT and service delivery. Findings showed that the majority of employees were males, and had basic computer knowledge. Further, the study showed that there is a strong inverse linear correlation between ICT and service delivery. The study recommends that Local Governments should invest more on ICT systems so as to strengthen ICT usage. This will in turn strengthen quality of services delivered. Local Government employees should be trained in order to equip them with modern ICT skills. The study finally proposed a framework for ICT adoption starting with Tororo District Local Government (LG).

Keywords: Adoption, ICT, local government, service delivery.

1. INTRODUCTION

The adoption and usage of Information and Communication Technology (ICT) is changing business processes, and the way people live and work. Innovations as a result of ICT are continuing to emerge. ICT is emerging as an important means for information sharing and exchange as well as a tool for development, including for LGs. However, this potential is yet to be fully harnessed. In fact this is as a result of the lack of adequate ICT affordable infrastructure and related service delivery as well as capacity deficit that many LGs continue to experience. It is also because of current development-policy environment and experience divides which hinders the effective mainstreaming of ICT in development (ICTD) interventions [1].

In October 1992, the Government of Uganda launched the decentralization program which had at its heart the recognition by Government of Uganda that LGs potentially have special comparative advantages as providers of public services by virtue of better information on local problems and priorities. The overall objective of the decentralization and local governance program is to ensure effective service delivery. This is based on the local.

The major services provided by District LG in Tororo include; education services, which cover nursery, primary, secondary. Medical and health services which include:-

Hospitals, other than those providing referral and medical training, Health centers, dispensaries, sub-Dispensaries and first aid posts. Others are Maternity and child welfare services, Primary health care services; provision and maintenance of water supplies, construction, rehabilitation of and maintenance of roads.

They also offer services like crop, animal and fisheries husbandry extension services through the current government plans under National Agricultural Advisory Services (NAADS); human resource management and development services; procurement and disposal of districts assets; tax collection and management of LG revenue; physical planning, land surveying and management.

1.1 Problem Statement

Regional and LG agencies face a pressing need to provide excellent citizen services in an effective and transparent manner, while working under constant resource constraints. In order to meet these challenges, public agencies are turning to ICT to enhance the services that they provide for residents, businesses and visitors. ICT also assists in improving the internal efficiencies by minimizing costs and maximizing productivity. The adoption of ICT in service delivery has not fully been embraced [2] since Local Governments (LGs) have not taken up the initiative wholly especially in the education sector. In this sector, there is great difficulty in monitoring and tracking of funds that are dispatched to these LGs by the central government. There is also a problem of corruption especially in the District Service Commission which is responsible for recruitment of staff.

Most delays are in processing documents such as land titles and birth certificates, among others. The District Registry inefficiencies are also attributed to inadequate ICT systems. Health services in Tororo District LG have also lagged behind because of lack of a health management Information system. This study therefore sought to investigate how ICT can be utilized to the full benefit of service delivery in Tororo District LG.

In Uganda, as worldwide, service delivery is a major problem [3]. The problems of poor service delivery

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in Uganda are mostly due to lack of accountability, transparency and commitment in making services work for poor and marginalized citizens [4]. Public service delivery has been inconsistent with citizen preferences and considered feeble in developing countries [5]. Factors such as inadequate targeting of the poor, supply driven planning, elite capturing of programs, lack of voice of the poor and inability to reach the government and service providers, are among the most common reasons (10)

1.2 Related Works

According to the Uganda poverty status report 2007/2008, the ICT literacy rate for Uganda stood at 15%. The urban areas had a higher ICT literacy status than in rural areas with 98% and 2% respectively. The multidimensional prevalence of poverty implies that the non-computer literate become hard-to-reach since ICT is not wide spread in Uganda; they get isolated from accessing good employment opportunities and also rapid information and communication advances and become marginalized in powerful modernizing processes.

Computer literacy has a role to play in ensuring that information technology (IT) is presented in a user-friendly manner that does reach grassroots level. The right to IT is a key to ensuring equal opportunities, social transformation and increasing demand for accountability from service providers. Without access to ICT, individuals and groups will be marginalized and will not be able to demand services which are their right.

In a report of 2004, Uganda national commission for UNESCO affirms that it is true that some families have high access to literacy skills than others. And equally true is that some communities have very few literacy practices in their core activities. There are many cases where learners' inability to use literacy and numeracy skills may not impede the accomplishment of daily real life tasks. In such situations, there is need to start with post-literacy learners in ICT-based literacy programs given the fact that they already know the benefits of literacy learning. In other words, creating a context in which there are lots of literacy activities so as to increase the motivation for learning literacy.

1.2.1 Service Delivery

We see the basic metric for service delivery as a 'cost per transaction', a simplified way of demonstrating the improvements and efficiencies possible via the proper use of ICT [6]. Service delivery to citizens falls into three areas – self-service, phone or counter-assisted service and direct service (e.g. home visits). Self-service has the lowest 'cost per transaction' and direct service the highest. Therefore the ideal is to make as many transactions as possible self-service, whilst also making the direct service as efficient as possible, using effective ICT provision to deliver communication services.

However, the use of ICT according to [7] is pervasive. It enables the delivery of information and services, and allows work to pass smoothly and

effectively between the providers of those services. These providers especially target certain sectors for example in education the focus can be on effective means of delivering scholastic materials to various schools and institutions, determining an appropriate means of identifying staff that requires staff development. It also allows people to work in different ways - such as from home or on the move – and ultimately provides the 'glue' between departments and partners.

Rakate [8], believes that ICT is key to service delivery and is one of the essential factors in promoting growth in the South African economy, a report by research and consulting company. The National Government Research Report, released in Johannesburg, focuses on ICT development, management skills, and convergence in cyberspace, cyberspace security and e-Government showing clearly that well developed and skilled personnel especially in the health sector, can foster better service delivery in this very significant aspect of life.

Direct services in form of ICT present a problem for all local authorities. Infact there is always a risk of potential physical abuse when employees are meeting the general public away from the office or when entering a citizen's home. Damovo provides a location-based solution which uses a simple GPS-enabled mobile phone and a web-based management platform, allowing the status and location of an employee to be tracked. It also allows the employee to trigger a panic alarm detailing their exact location should they find themselves under threat [9].

ICT infrastructures and services must manage and share sensitive information within the context of privacy, data protection, freedom of information and security, whilst also providing strong information governance. This is evident in [10] which reported that "people are no longer being treated as generic citizens". A new approach, using 'customer group' segmentation and profiling, allows local authorities to analyze citizen need more efficiently - and then to deliver services which are tailored to individual groups.

1.2.2 ICT Adoption Frameworks

Pedersen [11], claims that studies on ICT adoption have generally taken three possible approaches: a diffusion approach, an adoption approach and a domestication approach. Roger's Diffusion of Innovation theory [12] argues that media and interpersonal contacts provide information that influences a person's opinion and judgment. The theory comprises four elements: invention, diffusion through the social networks, time and consequences. Information filters through the networks and depending on the nature of the networks and the roles of its opinion leaders, new innovations are either adopted or rejected. Opinion leaders influence an audience through personal contact while intermediaries such as change agents and gatekeepers also contribute to the process of diffusion.

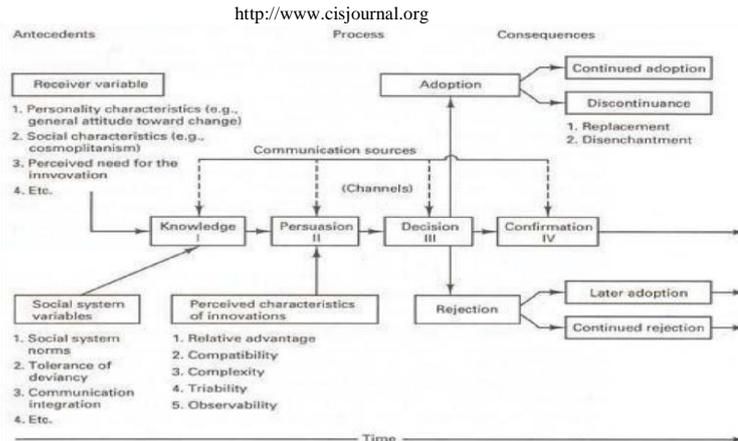


Figure 1: Rogers' diffusion of innovation adoption [13].

The adoption approach on the other hand describes and explains the adoption decision of users applying different individual and social decision making theories. Three widely used models include the Technology Acceptance Model (TAM), the Theory of Reasoned Action (TRA), and the extension of TRA into a Theory of Planned Behaviour (TPB) [11]. The TAM presented by Davis in [14] suggests that when a user is presented with a new technology, a number of factors influence their decision regarding how and when they will use it. This includes its perceived usefulness and its perceived ease of use. However, the TAM does not account for the influence and personal control factors on behaviour. Other factors such as economic factors, outside influences from suppliers, customers and competitors are also not considered by the TAM [14].

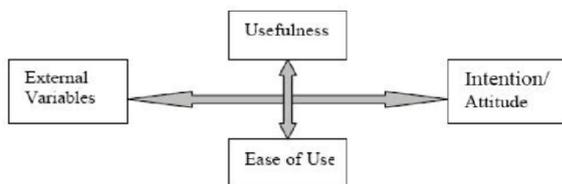


Figure 2: Technology acceptance model of ICT adoption [15].

The domestication approach focuses on the process in which technology becomes an integral part of our everyday habits. Conceptual context distinctions are applied to new phenomena. Three important distinctions include work and leisure context; end-users that belong or do not belong to a demographic group; and the private and the public. This view is dominated by sociologist researchers and is often characterized by demographic variables such as age and gender [11]. The following gaps were therefore identified in the literature review:

- i) Most studies look at the challenges encountered in adopting ICT for service delivery while this study aimed at investigating the effect of ICT on services delivery [16], [17], & [18].
- ii) Other studies dwell more on factors that must be considered to foster proper use of ICT systems

for services delivery while this study dealt with use of existing ICT infrastructures for services delivery [19] & [20].

- iii) Some scholars take ICT and services delivery on the broad perspective on a country wide basis [21]. While this study looked at ICT and service delivery in a local government settings and particularly the sectors of education, health and business.
- iv) Some studies on ICT adoption propose frameworks that leave out ICT training and literacy yet these factors are very critical for any ICT adoption success [11]. This study proposed an ICT adoption framework with ICT training as a key factor for the success of this framework.

2. METHODOLOGY

2.1 Research Design

Both qualitative and quantitative research approaches were used. Qualitative methods were used to investigate the effects of ICT on service delivery through explaining and describing the findings. While Quantitative methods were used to establish the relationship between ICT and service delivery, It was Survey and cross-sectional in nature because tools were administered to respondents at once and collected thereafter.

A sample of 157 respondents (See Table1) was selected using Krejcie and Morgan technique [22]. It comprised of workers and the study respondent. These further included; Chief information officers (CIO), technicians, government officials and the entire local government community. The choice of respondents were based on the criteria that they are literate and able to respond to the interview schedules and questionnaires administered.

The study used both probabilistic and non-probabilistic methods of sampling. For the case of the support staff, the researcher used random sampling, as they were many. For chief information officers and technicians, purposive sampling was applied because they were few and knowledgeable about the research problem.

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Table 1: Sample population and sample size

Categories of Respondents	Estimated Population	Sample Size
Administrative staff	50	44
CIO	30	28
Technicians	30	28
Supporting staff	68	57
Total	178	157

The study opted for administrative staffs because they deal directly with circulation of information within the various departments and therefore becoming the source for data. Therefore, for LGs to provide timely, transparent, efficient and effective services administrative staffs have to adopt ICT systems and skills. The CIOs are responsible for coordination of information within the district LG and various departments clearly showing the need for them to have basic knowledge of ICT and its applications. Technicians are responsible for technical work in the LGs such work is needed for proper service delivery therefore its quite imperative that they are equipped with proper ICT skills. The support staff is very vital in providing support to all other departments that are responsible for service delivery in LGs therefore this require them to be equipped with ICT skills.

2.2 Instrumentation

This involved questionnaires and interviews. Questionnaires were used to collect data from the randomly selected respondents about the various research questions. Questionnaires were used because of easy coding and facilitated collection of data on a wide range of opinions and on literate people. The questionnaires had 2 sections (that is' sections aimed investigating the demographic characteristic of respondents, level of ICT literacy and section aimed at establishing relationship between ICT and service delivery) with questions all rated at likert's scale in the range 1-2.

Interview schedules were equally used to collect primary data from the purposively selected respondents like technicians and chief information officers. The interviews were used since they were easily adaptable and effective because they encouraged probing for deeper information on part of the researcher whenever need arise.

2.3 Data Analysis

Data collected through questionnaires, and interview schedule were edited, coded, classified and tabulated. Methods of data analysis were both descriptive and inferential analysis, using SPSS. During data analysis at univariate level demographic characteristics, levels of ICT literacy were analyzed by measures of central tendency while at bivariate level ICT and service delivery were analyzed by person co-relation co-efficiency.

2.4 Quality Control

Reliability was ensured by a cronbach alpha coefficient defined as:

$$\alpha = \frac{K\sigma}{[\sigma + (K-1)\sigma_c]} \tag{1}$$

Where *K* is the component number, \bar{v} is the average variance, and \bar{c} is the average of all co variances between the components across the current sample of persons. From equation (1) above, 0.7 qualified the instrument reliable while validity was ensured by construct validity as identified with literature review.

3. FINDINGS AND DISCUSSIONS

3.1 The Conceptual Framework

According to the LG Act of 1997, the Central Government gave powers to LGs to deliver services on its behalf. A lot of services can be provided with the integration of ICT innovations. For example, ICT services such as telecommunication, managing information in health sectors with use of Health Management information system, internet applications and data bases.

The only way people can benefit from this integration of ICT services is through effective, efficient timely and transparent service delivery. The adoption of the usage of ICT can be traced on how effective, efficient, timely and transparent service delivery has been executed as seen in the frame work and tables below.

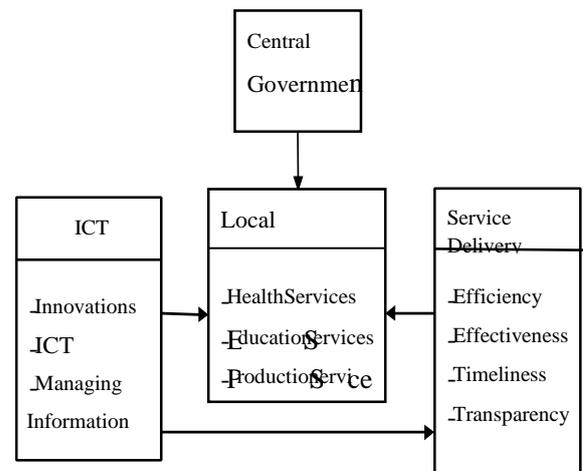


Figure 3: Conceptual framework

Table 2: Respondents' gender (Source: from the field)

Gender	Count	Percentage
Male	88	56
Female	69	44
Total	157	100

The data or research seems to show that the male respondents were majority (56%). The implication behind this is that males are vigilant in applying for LG jobs

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Table 3: The Age of the respondents

Response	Count	Percentage
16-26	40	25.4
27-37	60	38.2
38-48	35	22.2
49-59	15	9.5
60 and above	7	4.4
Total	157	100

From table 3 above, the age range 27-37 had response rate of 38.2 % coming out as the highest of all the total responses possibly because this population is youthful and dynamic in doing work. On the other hand, 60 and above had a least response of 4.4 % ,since majority of the people in this age bracket are retiring or have retired and had little knowledge about ICT.

Table 4: Education levels of respondents

Response	Count	Percentage
Primary	0	0.0%
Secondary	42	26.8%
Diploma	69	43.9%
Bachelors	37	23.6%
Masters	9	5.7%
Total	157	100

From table 4 above, Diploma had response rate of 43.9 % coming out as the highest of all the total responses possibly because local government mostly employs people who have at most finished Diploma courses. Besides, primary had no response because the researcher targeted only literate respondents.

Table 5: The level of literacy in LGs

Response Codes, N=157		Agree (1)	Disagree (2)
Questionnaire Item			
I can type my documents	Count	120	37
	Percentage	76.4	23.6
I know how to save my typed work	Count	90	67
	Percentage	57.3	42.7
I can use internet to send and read mails	Count	79	78
	Percentage	50.3	49.7
I can connect different computer devices rightly	Count	67	90
	Percentage	42.7	57.3
I can use internet to look for information I want to carry out	Count	88	69
	Percentage	56.1	43.9
I can use a mobile phone to transact internet related business	Count	90	67
	Percentage	57.3	42.7
I can connect different computers on the network	Count	57	100
	Percentage	36.3	63.7
I can trouble shoot and maintain computers	Count	69	88
	Percentage	43.9	56.1
I can design and maintain websites	Count	62	95
	Percentage	39.5	60.5
I can design and administer databases	Count	46	111
	Percentage	29.3	70.7
I can install software and hardware on computers	Count	77	80
	Percentage	49.0	51.0
I can trouble shoot networks	Count	39	118
	Percentage	24.8	75.2
I know most of the information security practices	Count	72	85
	Percentage	45.9	54.1
I can use one at least one accounting package	Count	45	112
	Percentage	28.7	71.3

From table 5 above, knowledge of basic computer application in terms of typing documents, saving typed work, using internet for mails and surfing to get information had the response and connecting different computer devices had the highest agreed response rates as indicated in the above table possibly because the local government mostly employs people who have at most

completed diploma level of education and ICT skills are taught as a module in almost all professions, besides connecting different networking devices, designing databases, troubleshooting networks and use of accounting packages had the highest disagreement rate implying that these are activities that require more

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technical knowledge in ICT and many respondents only had basic computer knowledge.

Table 6: Effects of ICT on the education sector in LGs

Response Codes,	[N = 157]	Agree	Disagree
Questionnaire Item			
Acquisition of UNEB results instantly.	Count	89	68
	Percentage (%)	56.7	43.3
Payment of school fees is faster.	Count	67	90
	Percentage (%)	42.7	57.3
Information retrieval from central database.	Count	30	127
	Percentage (%)	19.1	80.9
District examination board activities has improved because	Count	25	132
	Percentage (%)	15.9	84.1
ICT has improved communication between heads of	Count	70	87
	Percentage (%)	44.6	55.4
Monitoring and tracking of school materials delivery simplified.	Count	10	147
	Percentage(%)	6.4	93.6
District local government websites. displays information on	Count	27	130
	Percentage (%)	17.2	82.8
ICT makes provision of report on Inspection of schools better.	Count	28	129
	Percentage (%)	17.8	82.2

The above table indicated that acquisition of UNEB results instantly, ICT has improved communication between heads of schools and district LG authorities, payment of school fees is faster had the highest the agreed signifying a 56.6 %, 44.6% and 42.7% respectively .Majority of the respondents said, once the UNEB results are released, parents' access children's results immediately just through their phones without passing through schools as it used to be, this has made life so easy. Besides, monitoring and tracking of school materials delivery simplified, District examination board activities has improved because of ICT, had a disagreement response rate of 93.6 % and 84.1% coming out as the highest disagreement response. This could be indicative of the fact that there is lack of management information and tracking system at the district thus making tracking of such delivery difficult.

Table 7: Service delivery mechanisms used in LGs

Response	Count	Percentage
Internal Delivery Mechanisms	90	57.3
External Delivery Mechanisms	30	19.1
Municipal/District Service Delivery Mechanism	37	23.5
Total	157	100

From table 7 above, the majority of the respondents revealed internal delivery mechanisms which had a response rate of 57.3 %. This possibly implies that most services originate from within the various departments within local government signifying that there is need to strengthen ICT at departmental levels to enhance service delivery While external service delivery mechanism came with the least response possibly because this kind of service delivery originate from the collaboration between top administration in the LG and central government.

From table 8 below, delivery of better and more efficient health care services had agreed (79) response signifying of 50.3 % thus revealed as the highest agreed response of all. This seems to indicate that due to the computer age, local governments seems to be adopting system of computerization where information on drugs are stored in a data base system and as a result encouraging health centers to embrace. Tracking of expired drugs in hospitals, health centers have improved due to ICT came out with the highest number of disagreed response indicating 87.3 %. This could be attributed to lack of a proper training mechanism for using monitoring and tracking ICT tools and software, improper tracking information systems at the district and also poor if not inadequate technological infrastructure to support this kind of system.

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Table 8: Contribution of ICT in LG by service

Response Codes [N=157]		Agree	Disagree
Questionnaire Item			
ICT allows smooth and effective work between providers of services	Count	90	67
	Percentage	57.3	42.7
ICT enables social economic growth	Count	77	80
	Percentage	49.0	51.0
ICT can be used for citizen Centered Service Provision	Count	50	107
	Percentage	31.8	68.2
ICT develops high speed national and international broadband	Count	61	96
	Percentage	38.9	61.1
ICT fosters a knowledgeable workforce	Count	70	87
	Percentage	44.6	55.4
ICT promotes investment hence service delivery	Count	86	71
	Percentage	54.8	45.2

Response Codes, [N=157]		Agree	Disagree
Questionnaire Item			
Delivery of better & more efficient health care services.	Count	79	78
	Percentage	50.3	49.7
Easy communication	Count	67	90
	Percentage	42.7	49.7
Access to better health care information.	Count	73	84
	Percentage	46.5	53.5
Tracking of expired drugs in hospitals, health centers, etc.	Count	20	137
	Percentage	12.7	87.3
Management of patient information improved due to ICT usage.	Count	50	107
	Percentage	31.8	68.2

From table 9 below, ICT allows smooth and effective work between providers of services had agreed response rate of 57.3 % coming out as the highest of all the total responses. This is an implication that proper and updated ICT facilities are a basis for smooth and effective service delivery in terms of speed and convenience. On the other hand, ICT can be used for citizen centered service revealed the highest disagreed response coming out with a percentage rate 68.2%.

This can be assumed and attributed to lack of enough knowledge and exposure to ICT citizen centered services such as e-citizen registration of births and deaths.

Pearson’s correlation measured the correlation or strength of linear independence between two variables (ICT and service delivery). In this study, Pearson’s correlation indicated that there is a linear correlation between the two variables. The overall correlation index was - 0.94256 indicating a strong inverse linear correlation. This insinuates that the increase in ICT implies a reduction in service delivery

4. CONCLUSION

The research aimed at investigating the effect of ICT adoption and service delivery in Tororo District LG (TDLG). It had specific objectives like establishing ICT levels of TDLG workers and examining the delivery mechanism in LGs.

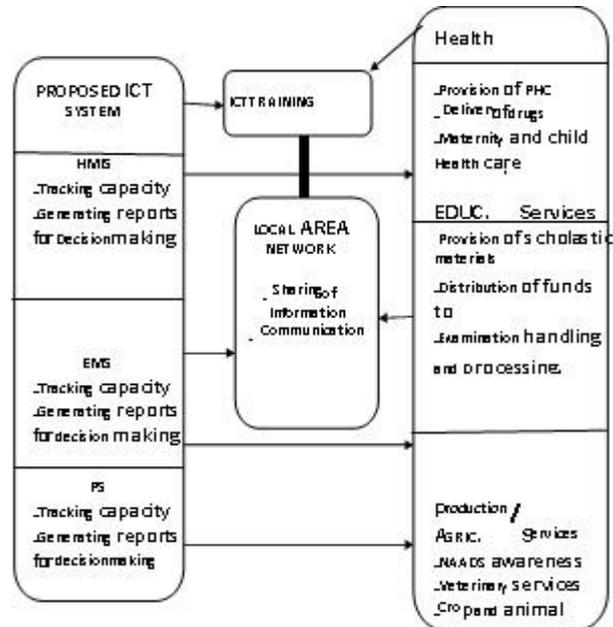


Figure 4: Proposed ICT adoption framework for LGs

The study looked at the effect of service delivery in TDLG. It investigated the relationship between ICT and service delivery. The results indicate that ICT has the potential to improve service delivery. It is also confirmed that TDLG just like other local governments uses more of internal service delivery mechanism compared to the other two service delivery mechanism. There is an urgent need for TDLG to employ ICT systems in all departments

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in view of prevailing concerns about service quality. ICT should be seen as a means of improving services in the future. The study also indicates that majority of respondents had basic computer knowledge and therefore integrating ICT would foster quick and effective service delivery to citizens in TDLG.

Finally, the study recommended as follows:

TDLG should develop and adopt proper management systems such as Health Management Information Systems (HMIS), Education Management Systems (EMS) and Production Management System (PMS) that can be used to reduce on time taken in tracking and retrieving and timely delivery of information necessary for its day to day activities especially in the sectors of education, health and business and production activities.

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