

The Impact of NICTBB in Facilitating the E-Services and M-Services in Tanzania

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Abstract—ICT services are a key element of communications and important for socio-economic development. In recognition of the importance of this, the Tanzanian Government started to implement a National ICT Broadband Infrastructure Fibre Optic Backbone (NICTBB) in 2009; this development was planned to be implemented in four phases using an optical dense wavelength division multiplexing (DWDM) network technology in collaboration with the Chinese Government through the Chinese International Telecommunications Construction Corporation (CITCC) under a bilateral agreement. This paper briefly explores the NICTBB network technologies implementation, operations and Internet bandwidth costs. It also provides an in depth assessment of the delivery of ICT services such as e-services and m-services in both urban and rural areas following commissioning of the NICTBB system. Following quantitative and qualitative approaches, the study shows that there have been significant improvements in utilization efficiency, effectiveness and the reliability of the ICT service such as e-services and m-services the NICTBB was commissioned.

Keywords—NICTBB, DWDM, Optic Fibre, Internet, ICT services, e-services, m-services.

I. INTRODUCTION

DURING the past few years there has been a global transformation in telecommunications; technological innovation, new regulatory and new license frameworks, market structures, and proliferation of ICT that have caused profound changes in available ICT services; this has contributed significantly to global economic development [1]. The revolution in ICT has created a new economy and caused radical changes in labour markets, a change in cultural expectations and the introduction of new products and services. The ICT revolution has resulted in a cognitive reframing of work and entrepreneurship that vies with traditional job definitions and the aspirations of labour market participants [1].

Accordingly, ICT infrastructure linked manufacturers with assembly plants, designs consultancies with factories, software engineers with hardware vendors, suppliers with retailers and retailers with customers. Nowadays, it is not necessary to have all the expertise in-house; by the use of ICT infrastructure, freelance designers can now send clothing patterns directly to an automated garment factory; and customers can order

anything from airline tickets to winter clothing online and do their own banking and pay bills electronically.

Hence, ICT infrastructure plays a vital role in the social, political, and economic development of every country; it is similar to motorways in the fifties, electricity at the beginning of the century and railways in the nineteenth century [2]. There is evidence that investment in ICT can itself contribute to socio-economic development [3]. For instance, ICT infrastructure is being used to deliver ICT service where it is needed and when it is needed, and in its most useful form. In this way, reliable ICT services reduces the influence of geographical obstacles in bringing people together, it improves the productivity and efficiency of: agriculture, business, industry, and social services.

Similarly in Tanzania, ICTs have been recognized as an important tool in accelerating poverty reduction, increasing productivity, generating economic growth, creating jobs, and facilitating learning, knowledge sharing and global information flows [3]. The ICT policy, legal and regulatory framework in Tanzania is encouraging; for example, the Tanzanian National ICT Policy [4] was developed in 2003 to prepare the country to become a hub of ICT infrastructure and ICT solutions that enhance sustainable socio-economic development and accelerated poverty reduction both nationally and globally. With a crucial objective to provide more affordable access to a range of ICT services to as many people as possible so as to enhance sustainable socio-economic development and allow its population to participate meaningfully in the globally networked economy.

The overall mission of ICT policy was to enhance nationwide economic growth and social progress by encouraging beneficial ICT activities in all sectors through providing and promoting multi-layered co-operation and knowledge sharing locally as well as globally. The establishment of ICT policy missions was also to facilitate the new licensing procedures for easy market entry, operator opportunity, new applications and ICT services. Thus to bridge the digital-divide between rural and urban areas by introducing district licenses supported by rural communications development; and enforcement of efficient utilization of network resources to create more employment.

Furthermore, to facilitate Tanzania in joining the group of countries with an integrated infrastructure for ICT in order to develop its economy and close the digital divide between the advanced and developing global information communities. Locally to optimize its contribution to the development of the Tanzanian economy as a whole by ensuring the availability of

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efficient, reliable and affordable ICT services throughout the country.

The National ICT policy was followed by the Universal Communications Service Access Act [5], which was enacted to ensure the availability of communication services in under-served rural and urban areas; and to promote the participation of public and private sectors in the provision of universal services in the under-served rural and urban areas; and to promote the socio-economic development of these rural and urban areas. Many studies have revealed that there is a highly positive correlation between socio economic development and ICT investment, for example the studies conducted by [6]-[8] revealed that ICT infrastructures can contribute to economic growth, not only in developed countries, but also in developing countries.

Consequently, it was suggested that the construction of a national ICT broadband backbone would enable the majority of Tanzanians to access communication services and to participate meaningfully in the information and knowledge economy [9]. Masegesa [10] discussed that the building of a Tanzanian national ICT backbone would attract investment and facilitate growth in the use of ICT services and other related applications that support other sectors of the economy and also enhance the e-government initiative. In recognition of the importance of ICT, the Tanzanian Government in year 2009 started to implement a National ICT Broadband Infrastructure Fibre Optic Backbone (NICTBB), in four phases, by the use of optical dense wavelength division multiplexing (DWDM) network technology in collaboration with the Chinese Government through the Chinese International Telecommunications Construction Corporation (CITCC) under a bilateral agreement.

The implementation of NICTBB was a part of the Tanzania National ICT [4] plan that was developed in 2003 and then acknowledged by the Tanzania Government in the National Development Vision 2025 [11], for its importance in enabling ICTs to accelerate achievements of the goals and objectives of the National Development Vision 2025 for National Economic Growth and Poverty Reduction Strategy (NEGPRS). The philosophy behind the deployment of a Tanzanian National ICT backbone is for Tanzania to become a hub of ICT infrastructure and have a sustainable ICT infrastructure that will provide higher capacity ICT services such as: Internet, voice, videos and other multimedia interactions - at an affordable cost to the majority of the people who live in the urban and rural areas of Tanzania. This would enable Tanzania to close the digital gap with other countries and enhance sustainable socioeconomic development and accelerate poverty reduction in the whole country.

II. OVERVIEW OF NICTBB IMPLEMENTATION

NICTBB is divided into four phases (1-4); Phase 1 initially started in Feb 2009 and was completed in June 2010, while phase 2 started in August 2010 and was completed in March

2012. Phase one and two provided 7,560 KM of optical fibre cable that has been connected to 21 regional and some district towns [12]. Phases three and four will connect all Tanzanian districts and villages, respectively.

The total proposed optical fibre cables for NICTBB is 10,000KM, which constitutes three rings; Northern, Southern and Western optical fibre rings [12] (See Fig. 1 below). NICTBB is land locked with neighboring countries and is currently connected to two submarine cables (Seacom and Eassy cable) to provide international connectivity, as per Fig. 2 below.

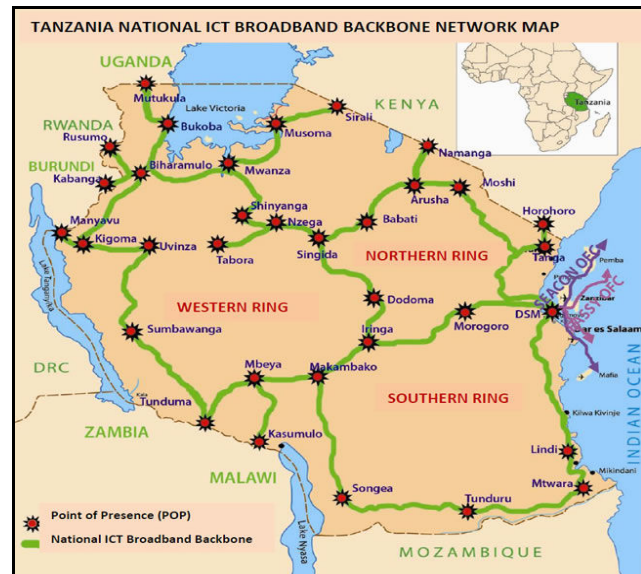


Fig. 1 Tanzania National ICT Broadband Network

In building the NICTBB, the government extended significant amounts of new fiber and also utilized existing fiber from entities such as the rail and electricity supply companies. The National ICT broadband backbone (NICTBB) is implemented on three network technologies: Dense wavelength division multiplexing (DWDM), Synchronous digital hierarchy (SDH) and Internet protocol (IP) [12]. This means that, NICTBB has adapted the transmission of IP over SDH over DWDM, in which IP packets (i.e. Internet traffic) are encapsulated and then transmitted by a router with either fast Ethernet (FE) or giga Ethernet (GE) port directly over SDH then to the DWDM optical layer [13].

The DWDM network incorporated into NICTBB supports 40 wavelengths per fibre and each wavelength can carry 10 Gb/s; thus enabling a single fibre to carry four hundred gigabits/s (400GB/s) of data.

Currently, NICTBB is managed and operated by the Tanzania Telecommunications Company Limited (TTCL) on behalf of the Government of United Republic of Tanzania through the Ministry of Communications Science and Technology (MCST). In this format, NICTBB operates as the wholesale business concentrating on the large capacity interface of the high-speed data streams i.e. Synchronous

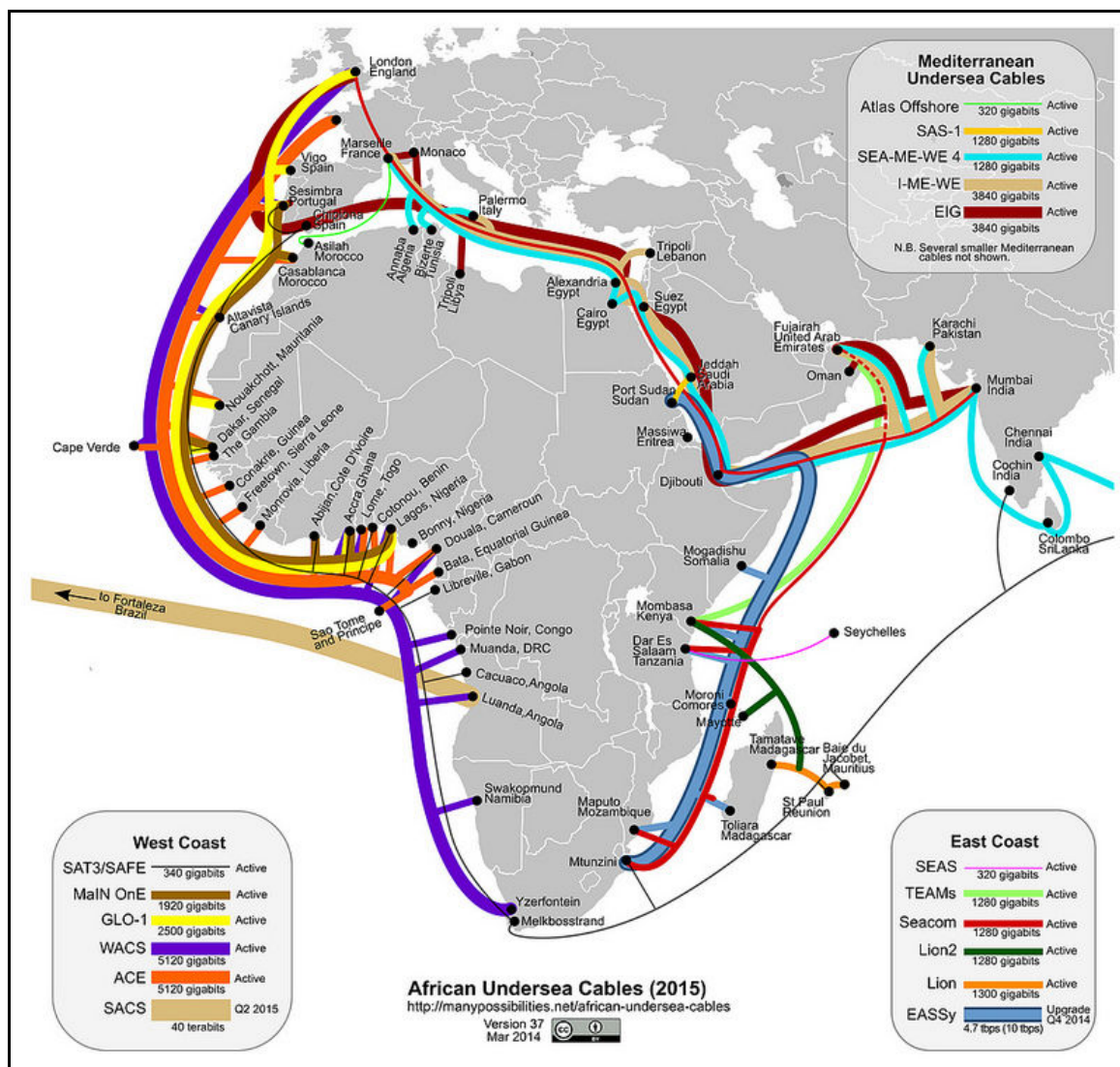


Fig. 2 African Undersea Optical Fibre Cables

Transport Module-STM-1 (155 Mb/s), STM-4 (622 Mb/s), STM-16 (2.4 Gb/s), and STM-64 (10 Gb/s) to telecomm operators [13].

The telecomm operators who are connected into NICTBB are carrier of carriers and acquire STMx from NICTBB and resell them to Internet service providers who provide Internet services to consumers [13]. With this arrangement, users access the Internet through Internet Service providers (ISP) via telecomm operators who are in turn connected internationally on submarine optical cables via NICTBB. Telecomm operators are allowed to use the NICTBB services on non-discriminatory Open Access terms. The telecomm operators who have been connected to NICTBB are TTCL; Airtel; Tigo; Zantel and Simbanet. Following NICTTB being connected internationally via the SEACOM undersea cable and the

Eastern African Sub-Marine cable System (EASSy), the International bandwidth cost reduced dramatically from \$1,500 per Mbps to \$180 per Mbps [14] that is equivalent to an eighty eight percent [88%] reduction. Also, according to this study, the international Internet bandwidth capacity has increased by 15x; however, it is still underutilized since only 65% of its capacity is being used. In addition, the capacity and cost for leasing STM to service operators is greatly decreased as shown in Table I below, as reported in [15].

TABLE I
NICTBB PRICING (US\$), 2010 [15]

Service	Annual Price (US\$)	Annual E1 Price (US\$)	Monthly E1 Price (US\$)
STM - 1	180,000.00	2857.14	238.10
STM - 4	432,000.00	1714.29	142.86
STM - 16	1,036,800.00	1028.57	85.71
STM - 64	2,488,320.00	617.14	51.43

As shown in Table I above, the highest priced bandwidth was US\$ 180,000.00/annum per STM-1 (155Mbps). While, it's annual and monthly NICTBB price per E1 (2.048Mbps) was equivalent to US\$ 2857.14 and US\$ 238.10 respectively, this is still expensive when compared to the International market price. In order to bring more flexibility to the NICTBB services, and align the NICTBB services to those of the international market.

The Indefeasible Right of Use (IRU) pricing was developed and released in 2011 [15]. With IRU terms, the purchaser pays upfront for the whole contract sum for services at the beginning of the contract; the short contract term is 10 years. Accordingly, the IRU prices for leasing NICTBB service was

published in 2011 [15] this reports that the Internet bandwidth costs had been reduced to a range of US\$ 107.14 to US\$ 23.14 per month for leasing a monthly STM capacity based on a 10 year contract.

Internet bandwidth cost is much less when the STM capacity is leased for a longer contract (i.e. 15 or 20 years). Hence using this pricing model the Internet bandwidth cost per annum in the year 2010/2011 was significantly reduced by more than thirty percent (30%) in 2012 as shown in Table II below. This shows that, since implementation of NICTBB and its connection to the submarine optical fibre cable, the Internet bandwidth costs for leasing STMx to telecomm operators is much lower and will be reduced further in the coming years.

TABLE II
NICTBB PRICING (US\$), 2012 [15]

Service	2010/2011	2012	Change
STM - 1	180,000.00	120,000	-33%
STM - 4	420,000.00	288,000	-31%
STM - 16	1,036,800.00	691,200	-33%

TABLE III
INTERNET BANDWIDTH TARIFF RATES

	Jul 2009	Dec 2009	Dec 2009	Dec 2011	Change
Internet tariffs for Retail Residential Market					
Broadband 1GB	N/A	\$ 18.57	N/A	N/A	
Broadband 2GB	\$ 61.90	\$ 37.14	\$ 18.57	\$ 18.57	-70%
Broadband 4GB	\$ 123.80	\$ 61.90	\$ 37.14	\$ 37.14	-70%
Internet tariffs for Retail SME Market					
Broadband 20GB	\$ 278.55	\$ 222.84	\$ 123.80	\$ 123.80	-56%
Broadband 40GB	\$ 619.00	\$ 278.55	\$ 222.84	\$ 222.84	-64%
Broadband 80GB	N/A	N/A	\$ 278.55	\$ 278.55	
Internet tariffs for Retail Corporate Market					
Dedicated 512Kbps	\$ 3466.40	\$ 1374.18	\$ 705.66	\$ 705.66	-80%
Dedicated 1024Kbps (1Mbps)	\$ 5694.81	\$ 1943.66	\$ 1163.72	\$ 1163.72	-80%
Dedicated 2048 (2Mbps)	\$ 7675.61	\$ 2896.92	\$ 2240.78	\$ 2240.78	-71%
MPLS VPN tariffs for corporate Market					
MPS VPN 256Kbps	\$ 800.00	\$ 800.00	\$ 800.00	\$ 350.00	-56%
MPLS VPN 512Kbps	\$ 1,500.00	\$ 1,050.00	\$ 1,050.00	\$ 480.00	-68%
MPLS VPN 1024Kbps (1Mbps)	\$ 2,500.00	\$ 2,040.00	\$ 2,040.00	\$ 720.00	-71%

Following reduction of costs for leasing STMx as indicated above in Tables I and II. The Internet bandwidth tariff rates for both commercial and residential operation has declined significantly as shown above in Table III.

III. METHODOLOGY

A survey research design was adopted in this study to enable generalization of the findings.

This study was conducted in the urban areas of Dar es Salaam, Morogoro and Coastal cities where NICTBB is widely deployed, and also most government ministries, development agencies and Institutions are based. Several remote areas of Mkuranga, Kibaha, Bagamoyo and Kisarawe districts in the coastal city were also included in the study to

elicit information relevant to the use of ICT by people living in rural areas.

A structured questionnaire was distributed to households who live in both rural and rural areas of the above selected areas where Internet or mobile communication services are accessed through NICTBB, so as to assess the impacts of the backbone in delivering ICT services since becoming operational. Guided interviews were used to collect qualitative data from ICT specialists, senior marketing officials and administrative officers in various ministries, departments and agencies (MDAs), and local government authorities (LGAs), which are based in the above selected cities; this included: Tanzania Communications Regulatory Authority (TCRA), Tanzania Telecommunications Company Limited (TTCL),

National Examination Council (NACTE), Commission for Science and Technology (COSTECH), TTCL, Airtel, Tigo, Zantel, Simbanet, National Microfinance Bank (NMB), National Bank of Commerce (NBC), Cooperative Rural Development bank (CRDB), The Development Bank formally known as the Tanzania Investment Bank (TIB), Tanzania Postal Bank (TPB), Eco Bank, Dar es Salaam Water and Sanitation Corporation (DAWASCO) and the Tanzania Revenue Authority (TRA).

The aim was to find the role of ICT in both public and private organizations whose internet services are provided through NICTBB. Also, a structured questionnaire was distributed to households who live in the selected rural areas so as to find the role of ICT in their daily activities. A semi-structured questionnaire was distributed via email to the above government and private officials who were not interviewed face-to-face. Furthermore, an online forum was also organized, where objectives were presented and discussed.

The objective of this forum was to collect ideas from households who are utilizing ICT services in both urban and rural areas, who opted to use the forum instead of filling structured questionnaires. In addition to the questionnaires and the guided interviews, a review of the literature from the above organizations and other sources, for example: newspapers, ICT journals, copies of letters, minutes, meetings or websites was also undertaken to supplement information collected through interviews. Controlled sampling techniques were used to select ICT specialists, senior marketing officials and administrative officers from the above public and private organizations for interviews and discussions. A snowballing technique was also used where households living in urban or rural areas were requested to identify other ICT participants. Qualitative and Quantitative techniques were used to analyze data obtained from guided interviews, questionnaires and literature in order to reveal the impact of NICTBB in delivering ICT services in both urban and rural areas in Tanzania.

IV. IMPACTS OF NICTBB IN FACILITATING E-SERVICES AND M-SERVICES

Following a thorough analysis of qualitative and quantitative data from secondary and primary sources, we found that there have been significant improvements in the: utilization efficiency, effectiveness and sustained ICT service such as e-services and m-services as described below, since the operations of the NICTCBB commenced.

A. M-Services

As revealed in Section II, telecomm operators such TTCL; Airtel; Tigo; Zantel and Simbanet are connected to the NICTBB. These telecomm operators are leading mobile broadband communication providers in Tanzania. As a result, the costs for accessing Internet services or for making a call or using the short messaging service (SMS) via mobile phone has been significantly reduced. For instance, the majority of Tanzanians can now afford to use wireless devices such as mobile phones or smart phones to make a cheap call, send

SMS, access Internet services or use m-services such as e-money/m-banking provided by Tigo, Vodacom, or Airtel to send/transfer money.

This has assisted rural area trade by being able to avoid travelling to urban areas to buy goods. Traders can now check the availability of goods and prices at different shops in urban areas, and order by making a simple call and pay using m-services. Similarly farmers can verify online the up-to-date market price for food products or by making a call before deciding to sell to the agents, thereby avoiding being cheated. Parents can pay school fees for their children via m-services rather than travelling all the way to the school where their children study. In this way, parents save the cost of travelling to the school where their children study and also become more productive in their daily work activities.

Also they can send increments of pocket money to their children instead of giving them a large amount of money all at once. People who live in remote rural areas who don't have bank accounts can use m-services to keep money stored in their mobile phone. This way they can withdraw money at any time and also it is a secure and convenient service that is safer than keeping money in their house.

B. E-Commerce

In the financial sector, the delivery of e-services such as e-commerce has been improved due the operation of NICTBB. For example: TANESCO, which is the largest Government Electrical Power Distribution Company, has connected all regional and district offices with NICTBB.

This has increased revenue collection as customers with Prepaid Electricity purchase (LUKU) meters are able to pay their bill through local agents or via e-money facilities. In this respect, customers are not wasting money and time in travelling to TANESCO regional or district offices, which are located a significant distance away. Similarly, Dar es Salaam Water and Sanitation Corporation (DAWASCO), which is the provider of water and sewage services in Dar es Salaam City, has improved the delivery of water bill services by connecting to the internet through NICTBB.

In this regard, customers access their water bills online or pay bills using the m-services. This has accelerated the delivery of water bills to the customers and also increased the revenue collection of the company. This has overcome past difficulties, before the NICTBB became operational. Previously the Company was facing many challenges relating to the handling of water bills including reading of water meters and timely delivery of water bills to the customers. Likewise, the Tanzania Revenue Authority (TRA) has implemented the Electronic Fiscal Device (EFD) system in order to boost revenue collections and simplify tax administration.

This system has facilitated none and VAT registered traders to issue receipts and invoices electronically. This device then transmits electronically tax information to a system server, which is located at TRA head office. In addition, TRA has automated various application forms online i.e. (Tin), VAT, VAT return, etc. Whereby, a customer fills in the form

electronically without visiting the TRA office. This has eliminated the need for people to travel long distances and queues at TRA offices.

C. E-Banking

Since the commissioning of the NICTBB, various banks in Tanzania, such as the National Microfinance Bank (NMB), National Bank of Commerce (NBC), Cooperative Rural Development bank (CRDB), Development Bank formally known as the Tanzania Investment Bank (TIB), Tanzania Postal Bank (TPB) and Eco bank have been connected. This has facilitated and enabled banks to improve the delivery of m-services to their customers. For example in the CRDB or NBC bank, customers use internet banking services to check account balances and pay or transfer money online.

This has helped customers to significantly reduce their travelling costs, as well as avoiding large queues in the banks. Other banks such as TPB have integrated banking services with e-money facilities. In this context when a customer receives a salary from his/her employer through TPB, they can easily transfer money to e-money accounts. Then withdraw his/her salary through any e-money agent in remote rural areas, where there are no direct banking services. Hence, employees can save time and the cost of travelling all the way to his/her bank, which is normally located in the district town center or urban areas. Similarly, NMB has enhanced its mobile banking services by connecting Internet to the Internet service provider (ISP) through the NICTBB.

This has allowed customers to be able to pay (DAWASCO) water bills, Tanzania Revenue Authority (TRA) Property tax and income tax, TANESCO prepaid electricity purchase (LUKU), etc through their bank accounts or through m-services via mobile phone; customers can access balance enquiries online or transfer money from their NMB accounts to e-money facilities. NICTBB connections to commercial banks in Tanzania have enabled substantial deployments of cash machines (i.e. ATM) in some rural and most urban areas so that customers can withdraw money anytime during the night time or weekends. This type of infrastructure is very attractive to the tourist industry and is already impacting revenues.

D. E-Education

Most Educational Institutions in Tanzania couldn't afford to buy large Internet bandwidth due to the high Internet bandwidth costs, previously this could only be provided via international Satellite links. This greatly hindered the development of Internet services, hence, the internet couldn't be used by students to access e-education facilities. However due to deployment of NICTBB, many Institutes have purchased large Internet bandwidths, due to the low cost of international internet bandwidth as reported in Section II above.

This has boosted the undergraduate admissions in many academic programmes such as Business Administration, Human Resources, Sales and Marketing, Information

Technology, Computer Science, Engineering, Agriculture, Economics, Management, Risk and Insurance, Accountancy, Financial and Banking, Laws, and Sociology, etc in higher learning institutions in Tanzania. This means that interested students now apply online via mobile phones or computer using the Tanzania Commission of Universities (TCU) Central Admission System (CAS) rather than physically visiting the institute in which they want to study.

The NICTBB implementation has facilitated the replacement of the previously cumbersome process that caused a lot of confusion and inconvenience to students and parents. Furthermore, students can register and check their results using their mobile phone or an internet café, when they are not on the institution's premises; most institutions' now have automated student academic records management systems. The Tanzania National council of examination (NACTE), is also exploiting the new infrastructure, which has improved the announcement of examination results for primary school (Grade 7), and Secondary school "O" and "A" level results. NACTE has connected its ICT infrastructure with internet service providers via the NICTBB. This has assisted students and parents to access results online. Prior to the availability of NICTBB, examination results were announced using huge printed books, so that students/parents had to physically visit their respective schools or examination centers for the purpose of viewing their results.

E. E-Government

Tanzanian governmental Ministries, Departments and Agencies (MDAs) and local government authorities (LGAs) have also been connected to the NICTBB. This has enhanced and sustained the use of the Human Capital Management Information system (HCMIS) in (MDAs), LGAs and other government institutions. The HCMIS system is hosted by president's office for public service management and used by the Ministry of Finance and Economic affairs to process payroll for all government employees in Tanzania.

The integrated HCMIS speeds up monthly salary payments to employees, whose information is validated by the president's office public service management and Ministry of finance and Economic affairs authority's officers. Accordingly, any government employees i.e. primary and secondary school teachers or any new government employee who works in remote rural areas can receive a salary straight away through his/her bank account. Another e-government example is the use of the EPICOR system. EPICOR is the accountancy software used for the Government of the United Republic of Tanzania's Integrated Financial Management System (IFMS).

This system is used for management of funds and cash flow, controlling the resource allocation, commitments, payments and bank reconciliation in the MDAs and LGAs. However, in the past, this system was connected by the use of wireless technology, which hindered the efficiency and effective use of the system. Since the NICTBB connection to MDAs and

LGAs, the use of EPICOR in Tanzania has significantly improved. It is currently in operation in all MDAs and LGAs.

This has helped Tanzania to significantly eliminate over expenditure, contain the country's debt burden and restore the confidence of international development partners. In addition, the Government of Tanzania has managed to implement a full budgeting, accounting and fiscal control infrastructure that has underpinned significantly improved fiscal management, helping the country to curb unbudgeted commitments and expenditures and address the demands of its development partners. It has therefore allowed tighter control on commitments and expenses and provides swifter response in honoring purchase agreements. As a result, the Treasury office knows exactly what is being spent and the national accounts are consolidated to provide centralized fund tracking.

V. CONCLUSION

The deployment of the NICTBB and its connections to submarine optical fibres has provided substantial and sustained ICT services in Tanzania. It has enabled the delivery of reliable e-services such as: e-government, e-commerce, e-banking and e-education. M-services (mobile services) in Tanzania have been significantly improved especially in rural areas or in urban areas where people couldn't afford to access such services before the operation of the NICTBB. With this perspective, farmer's nowadays can check online or use SMS to find where to get the best market prices for their food crops. NICTBB has also opened markets to small traders to check goods and prices with different shops in urban areas, and make orders by using SMS or making a simple call and pay through e-money facilities. Parents can pay tuition fees through m-services without visiting physical schools/college/Universities in which their children study. Using the national backbone, researchers from different institutions can access journals or proceedings of conferences online or use various social network services in finding relevant information concerning their areas of research.

The NICTBB also enables students far from an institutions campus to register for the next semester or academic year and also view performance results online. The NICTBB contributes to sustainability by reducing the amount road transport journeys for tasks that that can now be completed online. Various public and private organizations have improved revenue collections and enhanced delivery of e-services to their customers.

Furthermore, the connection of NICTBB to MDAs and LGAs has enabled the Tanzanian Government to manage the implementation of budgeting, accounting and the fiscal control system that has underpinned significantly improved fiscal management, helping the country to curb unbudgeted commitments and expenditures and to address the demands of its development partners. It has also has allowed the tighter control of commitments and expenses and provides swifter response in honoring purchase agreements. Therefore it is imperative for the Tanzanian government to ensure that

NICTBB is accessible and affordable to rural area populations so that the majority of Tanzanians can be effective in using all the available e-services or m-services, thereby accelerating economic development in Tanzania.

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