SUVL, SUIN and SudRen; the history of the Sudanese Education Network

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Abstract

Sudan used to be the largest country in Africa now separated into two countries, the Republic of the Sudan and the Republic of Southern Sudan. The Sudan (the new one) has a very large backbone of fibre owned by the telecoms, the national Electricity Grid and the petrol pipe lines.

SUVL (Sudanese Universities Virtual Library) started in 2004 on a frame relay (120kbps) connecting all thirty public universities, the connectivity was then described as frustratingly slow or dead slow. Interaction with African and international partners through UNet alliance encouraged a small group of stakeholders to fight for fibre and that was achieved by a fund from the national regulatory body. Now 27 public, 3 private universities and the National Research Centre are connected. SUVL first developed into SUIN (Sudanese Universities Information Network) and finally changed to SudREN owned by the Association of Sudanese Universities. A business model has been developed and the universities are gradually taking over the running cost of the new body. Internet connectivity through STM-1 is made available and a minimum of 2 mbps is allocated for each university. The users are still complaining; where are we failing?

Key words: Sudan. SUVL, SUIN, SudREN, NREN

1. Introduction

Sudan used to be the largest country in Africa until the 9th of July 2011 when it is separated voluntarily after a public referendum to the people of southern Sudan to generate two countries the Sudan and the Republic of Southern Sudan (1). Higher education started during the colonial time with small numbers in separate programs like the Khartoum Memorial College 1902, School of Medicine in 1924 and other such schools. At the dawn of independence those schools were brought together with the memorial college to make the University of Khartoum in 1956. Since then the institutions of higher education increased gradually until 1991 when a revolutionary increase was imposed so that every State will have its University so that the number became 30 public universities, 5 private or nonprofit universities and more that 40 other private colleges. The number of students crept from 30,000 in 1991 to more than 500,000 today (2). The republic of Southern Sudan has gone with its share of universities now 5 running. Internet service was established in 1997 and since then universities strived to utilize this new tool of communication. However, networking was not realized until 2004 when the Ministry of Higher Education started a project of virtual library for Sudanese universities and SUVL was born to serve this purpose. Thirty public universities were connected by frame relay with a server accessing the internet hosted by the University of Khartoum. Librarians of the universities were

asked to upload theses generated by their respective universities, 250,000 records including theses, books and periodical were provided from 6 universities. SUVL also provided links to free access literature, such as WHO Hinari, Agora, as well as access to some publishing houses like Oxford University Press. During that period the telecom company Sudatel had laid massive fibre backbone in the northern part of the country now the Sudan and it was clear there is a great unused resource under the ground. There is another fibre backbone with the petrol pipe lines starting from 1997 and the national electric grid covering vast areas of the country. Canar Telecom Company added more fibre in the country. SUVL was transformed into SUIN (Sudanese Universities Information Network) to serve as the national NREN to facilitate research and learning networking among the Sudanese tertiary education institutions and with regional and international institutions to breach the gap of the needs created by the expansion within scarcity of resources. SUIN was also administered by the Ministry of Higher Education. Pressure from enthusiastic users explored the possibility of connecting fibre to the respective members of SUIN to maximize the benefits of networking. That was possible by a fund from the national regulatory body the National Telecommunication Corporation (NTC) and 12 universities were connected in the first phase in 2008-2009, NTC was also paying for the internet of 15 Mbps for all universities with the NOC in the University of Khartoum. Another leap came when a meeting with the Minister of Communication and Information Technology (August 2010) resulted in sponsoring STM-1with 155 Mbps for SUIN from Sudatel which started February 2011.   The ownership of SUIN continued with the Ministry of Higher Education until a need for reform arose due to joining UbuntuNet Alliance, the ministry transferred its rights to the universities which took over at the end of 2009 through their representative body the Association of the Sudanese Universities (ASU). SUIN was granted a license from NTC to operate as an internet service provider (ISP) for its members in 2010. The CEO continued her post but moved to the University of Khartoum and a board was elected from Vice Chancellors and other persons beside the CEO. The board agreed to change the name SUIN to SudREN in conformity with the other NRENS in UbuntuNet Alliance.

2. Situation analysis

a. Governance
   SudREN is a nongovernmental body governed by a board elected from the owners the general assembly of the Association of Sudanese Universities. The governing board is responsible for policies, setting of prices of the bandwidth and employment. Executive administration (CEO) is responsible day to day running of the network and is accountable to the board.

b. Connectivity
   The network is connected by fibre to each university. The connectivity is provided by STM-1 (155mbps) distributed to the members with the minimum being 2 Mbps. The larger universities subscribed to 30 Mbps, 10 Mbps and 5 Mbps.

c. Business plan and sustainability
   SUIN/SudREN started as a government body which changed since end of 2009 to operate autonomously. However, still is largely dependent on government funds for the infrastructure. A financial expert is commissioned to establish a financial department and set

a business plan for the organization. The business model depends on costing of the bandwidth shared by the members to cover the STM-1 costs, salaries and the running costs. CEO, financial staff and the technical staff are contributed by the University of Khartoum and Sudan University of Science and Technology. SudREN pays top up salaries to be competitive.

d. Bandwidth Management

The administration and the technical team have imposed continuous online bandwidth management. The users' compliance to good use policy can be monitored by the administration and the other users. For example inappropriate use at odd times is clearly monitored. Weekly and monthly reports of bandwidth usage are generated and sent to members. The technical support staff is working on the development of knowledge management protocols.

e. Regional and International Relations

SudREN became the sixth member of UbuntuNet Alliance as the consequence became part of the U-NET projects in collaboration with European Union and the international community (AfricaConnect). SudREN is a member of AfriNIC organization and has got its own AS name and a good range of IP addresses. SudREN is a founding member of ASREN the Arab research and education network.

f. Services Provided

Apart from the internet connection the REN provides the following services
   i. Virtual library containing links to a great number of journals and scientific publications including BioOne, Cambridge University press e-journals, IOP, Oxford University press e-journals, Jstor, Aluka, Agora and Hinari (WHO) freely accessed within the network. SUVL also contains links to international libraries.
   ii. Video Conference System funded by NTC in 32 locations in the Sudanese universities and is administered from Sudan University of Science and Technology. The system is used for distance learning and meetings.
   iii. E-Science depending on tools like Grid computing which created an opportunity for interaction of researchers in the Sudan with others in Europe through CHAIN project.
   iv. Integrated Library and Digital Library System through a fund from UNESCO in collaboration with Sudan University of Science and Technology to be implemented in three Sudanese university libraries using open source protocols.

3. Lessons learned

The process of establishing the SudREN offered an opportunity to extract lessons which can benefit other organizations and the e-government project in the Sudan
   a. The collective purchase of bandwidth gave evident benefit of prize reduction
   b. Compliance to good use policy must strictly be observed
   c. Continuous monitoring of the bandwidth usage helps users and administration and gives a continuous feedback on the use.

4. Opportunities

a. The improvement of ICT infrastructure and connectivity
b. The enhancement of access to learning and research materials
c. The automation of academic and managerial procedures at the higher education institutions.
d. Introduction of modern learning techniques such as video conference, e-learning, e-medicine
e. Collaborative research opportunities between Sudanese institutions and more developed ones in Europe using tools such as grid computing.

5. Challenges

a. Sustainability of the network
b. Conflicting interests of telecom companies and the developing user ambitions
c. Breaching the digital gap between the senior administrative group in the institutions of higher education and the young generations

Where are we failing?

If we succeed to answer this question then we will be successful in managing and curing the different problems we are facing in our practice concerning the SudREN. Yes we can claim knowing some of those obstacles like

a. Most of the universities have no campus network.
b. In those campus connected universities they use mostly wireless for connecting the different campuses and a lot of complains from interruption of the system and hence mistrust
c. The culture of the networking is not well established among the leading groups in the higher education in the Sudan and therefore they give less attention to the network
d. We started with free internet for five years and the universities have still to learn to spend for their internet as it turned to be in the recent business model
e. Funds allocated for networking are small and come low in priority in almost all universities
f. SudREN needs to develop its communication strategies.

These issues collectively or separately have contributed to low accessibility of internet and other services to staff and students which is the main objective of the networking. There are efforts made by the board and SudREN administration to increase the awareness by targeting the ICT community in the universities by videoconferences to motivate them and provide them with the right information to train and motivate others in their campuses, and targeting specifically the vice chancellors and chief executives to make them aware of the benefits and to ask for their support for the project. The outcomes of such intervention cannot be assessed immediately. However, there is a positive feeling that we are following the right track from simple indicators such as the timely payment of the monthly fees and increased utilization of the bandwidth by several universities as shown on the weekly reports.

6. Methods of the study

This report depends on a triangulation of document analysis, questionnaire and observations. The questionnaire is conducted by telephone interview with the heads or operators of the net in the different universities. SudREN administration has distributed telephones to each center for their follow up and communication purpose. The questions included the time of connection, whether the university campuses are connected, if so with which system, whether staff and students have accessibility to the internet, if so free or paid, whether the staff and students are satisfied with the service, if so what rate of 1-10, the operators were also asked of their satisfaction with the rate of 1-10. The operators were asked of the problems they face if any and finally if they have any recommendations for improvements. The data were presented as quotations of the different interviewees, compared to the reports of the network administration and the observations made by the investigator.

7. Results

The results were taken from documents and 14 respondents from 14 universities. Twenty seven universities and one research center are connected to the Sudanese research and education network hosted in the University of Khartoum. The University of Sudan for Science and Technology hosts the center for videoconferences. Two universities are connected by wireless as the fibre has not reached its area, another university though connected by fibre insisted to use its ADSL subscribed directly to the telecom company. Twelve universities had been connected in the first phase during 2008-2009 and the rest of the universities were consequently connected until early 2011. Since 2008 the network had 15 Mbps internet connection for all universities until February 2011 when STM-1 of 155 Mbps was connected. The minimum subscription was 2 Mbps for each university with the larger universities subscribing 5, 10, 20 or 30 Mbps respectively. The usage of this bandwidth is monitored continuously and displayed on the website of the network. All universities had single point connections to the network and each university connects its campus(es). Only two universities, Khartoum and Sudan University for Science and technology connected all their campuses, few others are partially connected. Most of the universities are waiting for the coming project of campus connection funded by NTC. Surprisingly big universities in Khartoum State have not yet connected their campuses. Most of the interviewed persons stated their major problems include lack of funds for the networking, lack of internal connection of the campuses and problems with the wireless connections. Their recommendations included mostly the importance of connecting university campuses with fibre, allocating more funds for ICT. Some recommendations coming from single individuals but seem important include, regular meetings of the network leadership and technical staff in different universities to exchange experience, establishment of technical support unit for internal and external connections, group purchase of equipment with appropriate technical support. Fig (1) shows the weekly report of the administration of the bandwidth usage. This figure shows clearly the variation between universities in utilization of the subscribed bandwidth. The rating of the services varies from 4 to 10 of 10 with average of 7.8 of 10 likewise the satisfaction rate of the staff varies between 6 and 10, with average of 7.9. Some universities have no accessible internet for staff and students so not possible to talk about satisfaction.

8. Discussion and Recommendations

SudREN is the 6th member of UbuntuNet alliance and is counted among the well established NRENS in Africa. This is true looking at the history of its development under the Ministry of Higher Education until today when its an independent entity owned by the beneficiaries. The initial steps were important when the ministry was able to provide the funds for starting the network. The role of NTC which is the regulatory body was very crucial both for facilitation, licensing the NREN and funding the fibre infrastructure as well as paying the internet access until the organization was able to take over. They are still there to give hand whenever needed. SudREN gained from the establishment of a new Ministry of Communication. The Minister of Communication used to be an energetic member of SUIN Technical Support Committee. The network has advantage of being considered a priority project for the government in its strive to reduce the digital divide in the country. SudREN is operating autonomously which gave it the flexibility recommended by Terena (2010) (3) of the European Union and excellent relation with government bodies securing protection and funding known to be important in African setup (4). Given all these positive remarks still the REN is facing challenges mainly the marked difference between the member institutions in their readiness to develop their in campus connectivity and payment of the massively subsidized bandwidth cost. It is clear that some of the universities leadership lag behind in understanding the importance of the REN as a tool for development, giving no priority to any issues relating to ICT world. This is clear at least a few universities (One Vice Chancellor followed the advice of ill-motivated technical staff to continue subscribing directly to the telecom company of much less bandwidth for much higher cost, another vice chancellor said they don't need all this bandwidth and asked to have one quarter in spite of all explanations to him, a third one without giving a reason is not paying). Many institutions are not giving priority to development of ICT. However, the administration and technical staff of SudREN are gaining more grounds every day with dedication and patience as the core of the trained and motivating technical staff is forming a growing pressure group supported by a nationwide political will to empower this sector. The varying rating of satisfaction in this study shows clearly the varying institutional support for the REN. The difficulties mentioned by the technical staff mostly talking of in-campus connection and funding are issues for the board to work with though the connection of campuses is approved to be supported by the ministry of telecommunication. There are many important recommendations apart from the connection which will certainly increase the awareness and give solidarity to the less privileged ones.

In conclusion SudREN is a well established entity (4) with members of varying awareness, capacity and dedication but all are working towards the same goal. As there are great challenges there are opportunities to be realized. We are not failing but slowing down now and then to manoeuver some obstacles to have yet another leap. The door will continue to be open to those who could not join now especially the private universities without discrimination.

Acknowledgements

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Biography

Abdelrahim O. Mohamed a medical doctor, professor of biochemistry at the Faculty of Medicine, University of Khartoum. Former Vice Chancellor of the University of El Imam El Mahdi, former State Minister of Health in North Darfur, Western Sudan. Worked with colleagues to secure fibre connection for the Sudanese universities, now heading a committee for campus connection and working as a board member of SudREN. MBBS, MSc, PhD, Professor, SudREN Board Member