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Strategic Plan for the Implementation Of Satellite Television Mobile Learning (STV-ML)

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ABSTRACT

In this paper, we suggest the use of Television Decoders and Phone TV which receives signals from a broadcasting station via direct satellite, as a platform for the delivery of Digital, gigantic educational contents to learners. With the proliferation of TV decoders (e.g. star time, GoTv, DSTV, ACTV Darssat etc.) and Phone TV in Nigeria, Africa and the world at large, the people especially students become more aware of the technology, as the youth (students) often purchase and use them for home entertainment only, such as for sports (football) African movies, foreign films etc. The TV decoder and the phone TV can be more useful if it used for both educational and entertainment purposes, since internet services and penetration in Rural and sometimes in Urban Areas in Africa comes with huge challenges (such as cost, signal strength, penetration issues etc.) Hence the need for possible creation of audio visual lectures as channels for broadcast on the TV decoder and Phone TV. It has high quality TV reception even in rural areas, since its uses wireless technology, it has value-added service such as internet. The TV decoder Technology also known as direct-to-Home (DTH) services enable the delivery of video and other contents directly to a user's home via a satellite link using the decoder (STP-Set up box) and a small dish antenna and Phone TV for mobile learners. To this end, this paper is about a roadmap of an interactive Satellite signal TV Mobile-learning (S2TV-ML), in which a Satellite TV station is used as an integral part of a comprehensive interactive e-learning environment. The proposed framework would assists in building a reliable, efficient, and cost-effective environment to meet the growing demands of E-Learning all over the world, especially in developing countries. We also present a technical and technological solution for the installation of a digital television studio that can be used in an online educational framework, in order to generate the production of interactive and didactic material to provide a solution for online education, while we use National Open University of Nigeria (NOUN) as case study. Owing to the above, the high cost of streaming data for hours in the case of IPTV (internet protocol Television) which will not be financially convenient and attractive to students is eliminated, also it will enable institutions to have full control over it intellectual property without engaging a third party and by extension creating internally generated revenue (IGR).

Keywords: Strategic Plan, Implementation, Satellite Television, Mobile Learning (STV-ML)

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1. INTRODUCTION

The e-Learning requires handling and transmitting large amounts of text and multimedia materials, in addition to the demand of active participation of the learners in learning online. Such requirements place a heavy burden on internet service providers (ISP) who cannot supply their customers with proper bandwidth (low download rates) due to high Internet cost, and diverse remote locations. This problem, of course, is clearly evident in many developing countries who still suffer from very low Internet penetration rates along with insufficient Internet bandwidth for multimedia contents, thus negatively affecting the basic requirements for an efficient e-Learning environment. A viable solution to overcome the shortcomings of the Internet and/or communication bandwidth would be to leverage on the satellite signal TV reception with broadband Internet. In such a case, satellite reception eliminates the major problem associated with low download rates, while the Internet provides a means for users' interactivity. In addition to that, the issue of low Internet penetration rate is solved since satellite reception has a much higher penetration rate.

Statement of Problem:

Online education in developing countries is limited by reduced access to new information technologies that reduce the number of attendants/learners to online courses and high quality interactive teaching material, this condition makes it difficult to improve learning results. According to paragraph three, page four of the background documents of the National Open University of Nigeria (NOUN) Regional Strategic Plans for five years For NOUN: In Sub-Sahara Africa, 89% of learners do not have access to household computer, 82% do not have access to household internet, 11% are not covered by mobile networks.

Some learners in NOUN were unable to access and share digital resources and infrastructures for these reasons:

- ICT Competences
- Cost of data usage of advanced media; i.e., streaming video, large graphical and data files.
- Poor Internet Connectivity/Penetration rates
- Access to digital devices due to affordability issues.

One lean way out is to leverage on Digital satellite TV which is not internet enable or depend on Internet Protocol Television connections (IPTV) or ISP (Internet service provider) but Satellite Broadband internet connections.

Objectives of the Study:

The main features of the proposed framework is the ability to overcome the limitations of Internet bandwidth while delivering E-Learning material for single and institutional users through the combination of satellite and Internet communications. Several other features and advantages may also include:

- To break the barriers to access and sharing of digital resources and infrastructures
- To deliver high-quality multimedia educational contents
- To live coverage teaching classes, local events, workshops, and international events
- To provide a back bone for the deployment of Virtual Labs
- To live coverage e-Learning video broadcast
- To develop Interactive TV capabilities
- To deploy Satellite video conferencing

- To live coverage important educational news coverage
- To Share educational media across the country and sub-Sahara region
- To encourage Educational media production
- To Market locally produced educational material around the globe
- To Market African University internationally

Research Problems:

1. Are there adequate educational broadcasting specialists in NOUN?
2. Are there reliable internet coverage for NOUN learners both in Rural and Urban Areas?
3. Are there adequate media facilities for educational broadcasting in NOUN?
4. Does NOUN transmit educative contents to the public?
5. Can learners afford data streaming for hours during live classes?
6. Is there a centralized broadcasting center at NOUN?
5. Are there Digital Educational Contents for NOUN learners?

2. LITERATURE SURVEY

Main while, education is the bedrock of development in any society, and one important means of educating people is through the use of broadcast media. Broadcasting is the transmission of signals to many receivers or viewers simultaneously via powerful electromagnetic waves. Udomisor (2013) defined broadcasting as the distribution of audio and video contents to a dispersed audience via any audio-visual medium. One of the major role of broadcasting stations are to inform and educate. Udomisor (2013) also added that broadcasting is very important in Africa because majority of Africans get their information, education and entertainment from primarily radio and then television.

Television broadcasting in learning is an important aspect of learning. It has the ability to combine sound, visuals and text (multimedia), this gives it advantage over traditional face to face method of learning. (Biobaaku, et al, 2012). The Satellite TV portrays reality and offers a wide range of valuable contents for the benefits of learners and the society at large. The educational significance of ST-ML programme cannot be over-emphasized. Biobaku, et al (2012) was of the view that TV contents shape behavior. To this end, Oketumbi (2007) charges broadcast stations in Nigeria to accord the greatest priority to educational programmes.

3. MATERIALS AND METHODS:

The methodology that is adopted in implementing the Satellite Signal Television (S2TV)-M Learning framework that is reliable, efficient, and cost-effective education system depends on the availability of the following conditions:

1. Construction cost.
2. Infrastructure.
3. Educational materials.
4. National and market needs.

We therefore, proposed a three-phase implementation methodology, which are:

1. Constructing a single channel earth station.
2. Expand the number of channels, Developed for teaching and learning
3. Establishment of Centralized Broadcasting Station and interactive Client side

To overcome the drawback of the insufficient download bandwidth of current Internet and conventional telecommunication systems, a satellite TV broadband communication channel can be used for downloading bandwidth-demanding learning materials, to meet the demand of active participation of the learners.

Phases of Implementation:

Phase 1. The Construction of a single channel earth station and a Broadcasting Center

Here, the basic transmission/receiver earth station is established and it's consists of the following subsystems: antenna subsystem; low-noise amplifier subsystem; downlink subsystem; uplink subsystem; and earth station controller. Also, this phase includes the construction of broadcast and media production/editing centers. A broadcasting center should be equipped with digital transmission components, networks and studios. The media production/editing center should be equipped with technologies to provide a complete solution for producing and editing of education materials. Other requirements may include: location of earth station, satellite connection, license, and space segment.

Phase 2. The creation and Expansion of the number of a broadcasting channels

To enhance the performance of the STV-ML system and to meet any future demands, the creation of dedicated channel is a must and the expansion of the number of broadcast channels so that it can broadcast not only education programs but also the Administration and learning support services of the University, and the various faculties in the University.

Phase 3. Establishment of an interactive Client side: Several clients (e.g. Decoders and Phone TV receivers) can be connected to the CBC and can share the resources for reception and broadcasting of educational materials. The typical setting required by a university is minimal and consists of a satellite dish connected to a STB (Set Top Box) known as Decoders with DVR. And the use of Phone TV to receive signals from the Satellite TV. If the university wishes, a mobile broadcasting van, this can be readily made available for live broadcasting and live event coverage.

4. ADVANTAGES OF S2TV-ML OVER IP BASED OR INTERNET ENABLED TECHNOLOGIES:

The important features of S2TV-ML (Satellite Television Mobile learning) system is that it can cover a wide and different categories of users such users who are looking for educational programs on TV who don't have or use PC and/or Internet access, too young or too old to use PC/Internet, unable to afford buying PC or subscribing for Internet, those who lacks motivation to use PC for learning. Learners that are located at homes, schools, universities, and work. This is because of the following:

- Learners are already familiar with the devices.
- Learners feel more comfortable in using devices.
- NOUN stands to benefit from internally generated revenue (IGR)
It can form the back bone for deploying Virtual labs

- Devices are available in their homes.
- Availability and affordability of TV phones.
- Availability of Broadband Internet connections.
- Ability to control viewing of live TV (pause, forward, rewind, record).
- Ability to view a program while recording.
- Ability to broadcast 3-D programs without third party getting involved.

IPTV VS S2TV- ML (Internet Protocol Television VS Satellite Signal Television Mobile Learning)

The issue with IPTV for downloading gigantic learning contents is that it's require a very high bandwidth internet connections, a commodity that is either unavailable or just too expensive in developing countries, while S2TV comes with Broadband (high data rates) with wide signal penetration even in rural areas and far less expensive and the cost not directly incurred by learners.

Interference

Transmissions via Satellite are affected by moisture and various forms of precipitation (such as rain or snow) in the signal path between end users or and the satellite being utilized. This interference with the signal is known as rain fade. The effects are less pronounced on the lower frequency 'L' and 'C' bands but can become quite severe on the higher frequency 'Ku' and 'Ka' band. For activities like streaming, the lag may delay the initial load, but it should no longer be an issue once the stream starts because your download will be ahead of it.

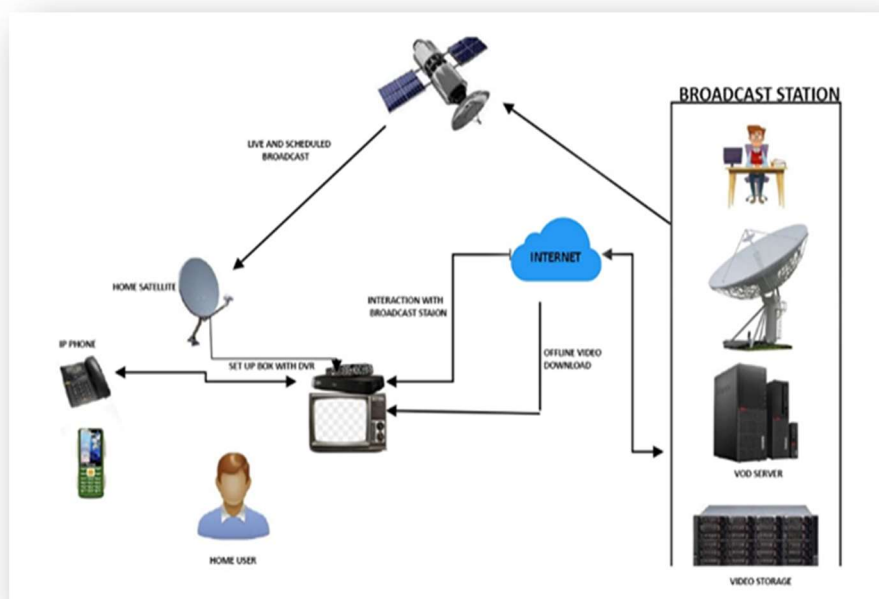


Figure 1. A home Learner with capabilities to interact with Broadcasting Station and video on demand Services

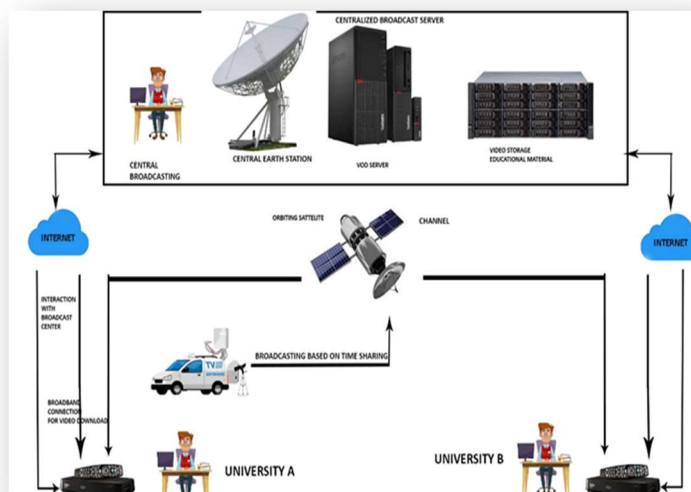


Figure 2. A Broadcasting center providing Universities with broadcasting and Video on Demand services

Personnel Needed For Satellite TV Mobile Learning

Music, Mass Communication, Journalism, Instructional Technology, Communication Arts, Educational Communication, Photo-Journalism, Educational Technology, Network Engineer, Sound Engineer/video editor, Multimedia Content developer/Animators professionals etc.

Media Facilities/Equipment Needed For Satellite TV Mobile Learning

Audio console, Vision mixer, Headset gadgets, Chroma key, Flood light & fill light, Teleprompter, Microphones, Studio, Editing suite, Video cameras, Transmitter, Mobile broadcasting van, Monitor sets, Satellite facilities/ Services, Internet facilities, Broadcasting Channel, Decoders, Phone TV, Earth Station etc.

Institutional Capacity

Educational institutions should have the technical, technological and human capacity, with this study to leverage on Satellite TV, in order to converge with new technological trends to generate audiovisual content that supports the formation of the resource human qualified and literate in the use of information technologies for satellite TV Mobile education. The ViewMedia and EduSAT satellite can be consulted for satellite signal transmission to deliver on this task. The Learning contents currently been produced in collaboration with academic staff in the directorate of learning contents, and the Equipment and facilities in the directorate of Media should be harnessed towards the purpose of seamless Satellite TV Mobile learning. Also the media Studio should be converted into a Broadcasting center.

STS (Satellite transmission service) technologies utilization makes easy the access for students and teachers, the operation is transparent for all of them and the responsibility falls over network operator, that controls and monitors all network devices including television studio equipment, therefore, the teacher put his attention into his lecture that is parallel and recorded on storage server for an offline reproduction.

5. RECOMMENDATIONS

Based on our major findings, the following recommendations are made:

1. Media facilities (in Directorate of media) and learning contents Management Systems (in LCMS) at NOUN should be channeled majorly towards discharging the educative duties of broadcast TV stations;
2. Professionals who can effectively plan and execute educational broadcasting should be recruited in the station;
3. Contents being transmitted to learners and public should not only be informative and entertaining ones but more importantly educative contents; and
4. The NOUN should have a monitoring team saddled with the responsibilities of regulating digital contents to be transmitted via Satellite Television (STV).
5. There should be in house establishment of CBC (centralized Broadcasting center), Earth stations and Satellite TV services.
7. The West African Universities should initiate processes and procedures for the manufacturing of customized/Branded TV decoders and TV phones to aid seamless transmission of her educational contents across sub-Sahara region.
8. The NOUN should partner with Satellite servicing Company e.g. View Media based in UK and EduSAT Technology Educational outreach in Italy.
9. The NOUN should have a Mobile Broadcasting Van based time sharing that would live cover educational activities all-round the country Nigeria.

6. CONCLUSION

In this work, we proposed an implementation strategy of an interactive S2TV-ML system that uses satellite technologies to relay M-Learning platform which is reliable, efficient, and cost effective. Having an IP-based M-Learning technology that may not be attractive and affordable by learners will not be desirable. S2TV-ML is more convenient to many users who are located at home, schools, universities, work, especially in rural areas. This is as a result of the availability of satellite reception technologies and its usability, in addition the cost of buying data on the part of learners are completely eliminated, this would encourage students to effectively make use of the technology capable of generating humongous funds to universities while their image will be promoted beyond the shores of Africa.

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