RECENT TRENDS IN MOBILE TV TECHNOLOGY

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Abstact:- **Mobile TV is the latest technology where the TV services are streamed on to the mobile or hand-held devices. Mobile TV is going to get more and more prevalent over next couple years. There is lot of momentum in area, even if there are a few commercial products so far. Already many mobile operators offer a selection of television channels or individual shows, which are streamed across their third generation (3G) networks. Mobile television or mobile TV is a new way of watching television. You can watch broadcast programmers for information, entertainment and education on your mobile phones by simply subscribing to TV channel package with your mobile phones. Responding to the promising market of mobile TV, manufacturers have started to introduce their mobile TV.**

Keywords :-
MBMS- Multimedia Broadcast Multicast Service
UMTS- Universal Mobile Telecommunication System
ISDB- Integrated Services Digital Broadcasting
MPEG- Motion Picture Expert Group
DMB- Digital Multimedia Broadcast
DAB- Digital Audio Broadcast
DVB- Digital Video Broadcast

1. INTRODUCTION

No doubt the biggest media in history is TV and the biggest communication industry nowadays is mobile phone. Mobile TV will be a killer application in the next generation of mobile phones, creating a new convergence paradigm of broadcast and mobile services. Mobile TV involves bringing TV services to mobile phones. Today's mobile digital broadcasting technologies enable the combination of that two in one device, the mobile TV phone. Using their mobile TV phone, people could enjoy real-time news, sports, weather forecast, and live entertainments in fast-moving car, outdoors, and anywhere. In addition to mobility, mobile TV delivers a variety of services including video-on demand, and live TV programs.

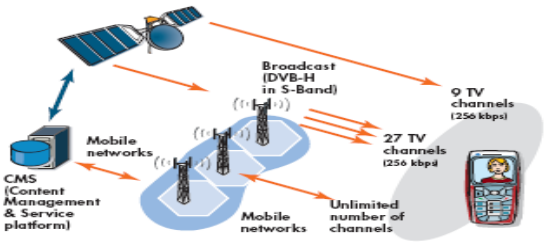

Fig 1: Mobile TV Concept (generalised figure)

Another exciting opportunity for user's is mobile TV broadcast, where contain is delivered to a user's mobile on demand or by subscriptions. Stored locally on the handset, this contain can then be viewed even when
there's no network connection. And service provider can schedule the delivery to" off-peak" hour, for e.g. - during night.

Indian Scenario

DD has launched eight channels on mobile for the first time in India; a pilot project for providing television on mobile phones is being launched by Doordarshan. The service will initially be free to air and the channels available on the Digital Video Broadcasting Handheld (DVB-H) mode will be: DD National (DD 1), DD News, DD Bharti, DD Sports, DD Urdu, DD Bangla and DD Podhigai. Officials claimed that the test runs for DVB-H had been successful, and expressed the hope that number of channels would be raised to ten to 15 in the next few months. According to him, the cost of TV compatible handset had been brought down to Rs 18,000 from the initial Rs 32,000 and may come down further to around Rs 6000.

2. TRANSMISSION MODES

Technology, there are currently two main ways of delivering mobile TV. The first is via a two-way cellular network and the second is through a one way dedicated broadcast network.

I. TWO WAY CELLULAR NETWORKS

Out of the 120 plus commercially launched mobile TV services worldwide, more than 90% of these are based on existing two-way cellular networks, using unicast. With unicast, contain is transmitted separately from a server to a mobile handset Land-based broadcasting methods send out analog or digital TV signals over the air from terrestrial base stations. A phone with a TV antenna and an analog or digital TV tuner (receiver) can pick up the signals.
There are bunch of mobile-TV versions like T-DMB (Terrestrial Digital Multimedia Broadcast), MBMS (Multimedia Broadcast and Multicast Services), MediaFLO (a proprietary Qualcomm technology) and DVB-H which use this mode of transmission.

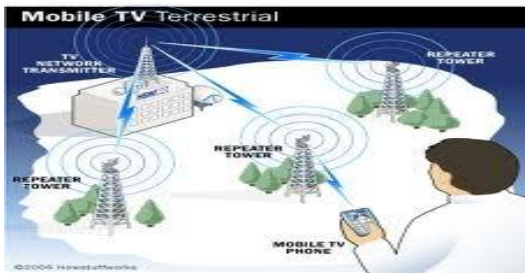

Fig 3: Mobile TV Terrestrial

II. SATELLITE BROADCASTING

Some standards rely on satellite broadcasting to deliver live TV to cell phones. They can broadcast from satellite to phone, from satellite to base station to phone or use both methods simultaneously.

Two systems that employ this approach are MBSAT and S-DMB. In the s-DMB (Satellite Digital Multimedia Broadcasting) system, a content server sends the live TV feed through an encoder and transmits the data to an S-DMB satellite. The geostationary satellite rebroadcasts the signals directly to terrestrial repeaters and directly to cell phones on S-band. The terrestrial repeaters fill in gaps where satellite signals get disrupted, like in a city surrounded by tall buildings or in the subway. The dual broadcasts are coordinated so that if a subscriber happens to be within range of the satellite and a tower at the same time, he'll receive both broadcasts and end up with stronger signal.

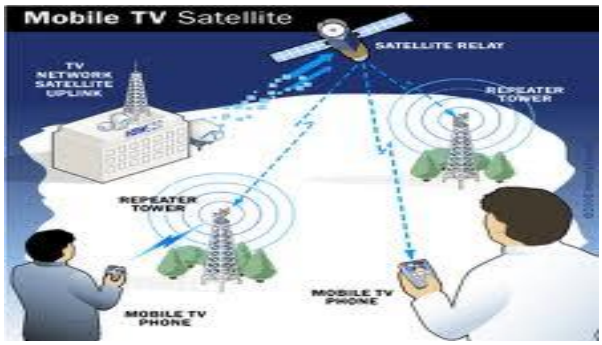

Fig 4: Mobile TV Satellite Broadcasting

3. DIFFERENT TECHNOLOGY

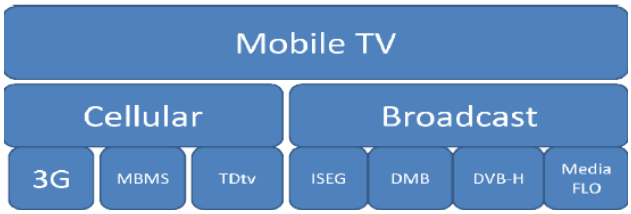

Fig 5: Different technologies

The above technologies are used. None is ideal as all have drawbacks of one kind or another. Spectral frequencies used or needed; signal strength required, new antennas and towers, network capacity required, or business model.

CELLULAR-I: 3G

HSDPA is an evolution of 3G technology for the carriage of higher data rates in a quest to support video services. HSDPA can extend the bit rate to 10 Mbps or even greater (down link) on 5-MHz 3G networks. This is achieved using new physical layer techniques such as adaptive modulation and coding, fast packet scheduling, and fast cell selection. On average a user can expect 550-1000 kbps download speeds even in loaded environment. This makes possible the delivery of DVD quality video for the small screens of the mobile TV.

CELLULAR-II: MBMS

Multimedia Broadcast Multicast Service is broadcasting service that can be offered via existing GSM and UMTS cellular networks. MBMS will start to be rolled out in cellular networks during 2008 and gives opportunity to broadcast TV, film, information and other media in these networks. MBMS has the major benefits that the network infrastructure is already there for mobile network operators and the deployment can be cost effective compared with building a new network for services. The infrastructure offers an option to use an uplink channel for interaction between the service and the user. MBMS uses multicast distribution in the core network instead of point-to-point links for each end device. The broadcast capability enables to reach unlimited number of users with constant network load. Further it also enables the possibility to broadcast information simultaneously to many cellular subscribers for example emergency alerts.

Multimedia Broadcast Service: uses the 3G pipe to send streaming video and audio to subscribers via 3G cellular networks. There are 2 modes: broadcast, and multicast. However, many design issues remain in order to provide multicast service.

CELLULAR-III: TDtv

TDtv combines IP Wireless commercial UMTS TD-CDMA solution and 3GPP Release 6 Multimedia Broadcast Multicast Service (MBMS) to deliver Mobile TV. TDtv operates in universal unpaired 3G spectrum bands that are available worldwide at 1900 MHz and 2010 MHz It allows UMTS operators to fully utilize their existing spectrum and base stations to offer mobile TV and multimedia packages without impacting other voice and data 3G services.

DRAWBACK

It still needs separate RF transmitter installed on each base station. Integrating the network into a 3G network means that each operator has to build its own TDtv network rather than having a 3rd party build a network that all operators can access.

BROACAST-I: I-SEG

ISEG is a mobile terrestrial digital audio/video and data broadcasting service in Japan. Terrestrial digital broadcast in

Japan (ISDB-T) is designed so that each channel is divided in to 13 segments (plus one segment for separating channels). HDTV broadcast occupies 12 segments, and the remaining (13th) one segment is used for mobile receivers. Thus the name, '1seg'

Integrated Services Digital Broadcasting-Terrestrial **(ISDB-T**) a satellite-to-tower system similar to DVB-T, today used in Japan to provide digital service to TV sets and handheld mobile units. It has a bandwidth of 5.6MHz with 13 channels embedded.

DRAWBACK

Almost a year after the 1seg trial Mobile reception is difficult, especially in a moving vehicle/train, as the signal quality deteriorates quickly even at speeds around 20 km/h (12 mph). This leaves the majority of target audience for this service unable to receive it.

BROADCAST-II: DMB

Digital Multimedia Broadcasting is made for transmissions on radio frequency bands III (VHF) and L (UHF), for terrestrial.

The audio and video is encapsulated in MPEG-2 TS. In order to diminish the channel effects such as fading and shadowing, DMB modem uses OFDM-DQPSK modulation. A single-chip T-DMB receiver is also provided by an MPEG-2 transport stream demultiplexer. DMB has several applications devices such as mobile phone, portable TV, PDA and telemetric devices for automobile.

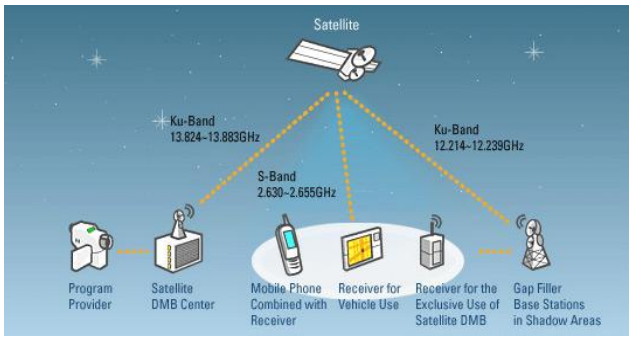

Fig 6: Digital Multimedia Broadcasting

Digital Multimedia Broadcasting: This is an extension of the DAB (Digital Audio Broadcasting) standard which was started in some European countries (including Germany and others) without success. The government of South Korea has invested heavily to extend the audio-only technology to enable multimedia broadcast (now called DMB), and it appears likely that South Korea will adopt this standard, in both a Satellite (S-DMB) and Terrestrial (T-DMB) version. Recently, a technical trial of the DMB standard was conducted by Germany's T-Systems in preparation for the World Cup 2006.

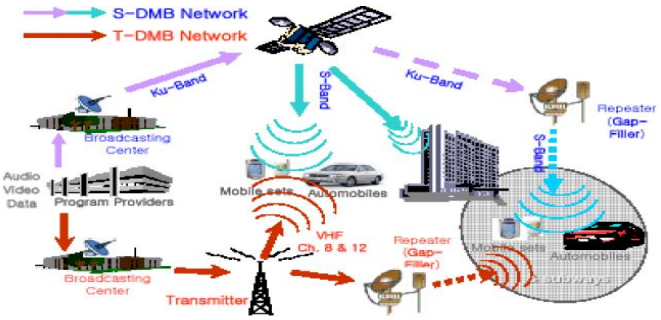

Fig 7: Digital Multimedia Network

DRAWBACKS

DMB is less efficient than DVB-H, but DMB can still carry almost 4 times as many radio stations as DAB, and is therefore almost 4 times cheaper to implement in terms of cost service.

BROADCAST-III: DVB

Digital Video Broadcasting technology is a superset of the very successful DVB-T (Digital Video Broadcasting Terrestrial) system for digital terrestrial television, with additional features to meet the specific requirements of handheld, battery-powered receivers.

All data is transmitted in MPEG-2 transport streams with some additional constraints (DVB-MPEG). DVB-H can offer a downstream channel at high data rates which can be used as standalone or as an enhancement of mobile used as standalone or as an enhancement of mobile telecommunication networks which many typical handheld terminals are able to access anyway. Time slicing technology is employed to reduce power consumption for small handheld terminals.

Digital Video Broadcast-Handheld: an extension of the DVB-T (Terrestrial) standard now being used for digital service to TV sets in Europe. Programming is fed from satellites to transmission towers, and then distributed to receiving devices. It's designed to accommodate the unique reception requirements imposed by mobile users and the limits of an antenna embedded in the handset environment.

Both the DVB-T and DVB-H standards are designed specifically for broadcast "one-to-many" wireless data transport.

DRAWBACK

DVB-H is good solution but high license costs and L-band spectrum would damage its business case.

BROADCAST-IV: MediaFLO

MediaFLO is Qualcomm's new technology to broadcast data to portable devices such as cell phones and PDAs. Broadcast data will include multiple real-time audio and video streams, individual, non-real-time video and audio "clips", as well as IP Data cast application data such as stock market quotes, sports scores, and whether reports. The data transmission path is one-way, from the tower to the device. The MediaFLO system transmits data on a frequency separate from the frequencies used by current cellular networks.

FLO (Forward Link Only):- a Qualcomm-proposed technology and network that uses a limited number of high-power transmission towers. In one of its operation modes, the technology provides network-scheduled delivery of multimedia content over the network during off-peak hours. The content is then stored on the handset for future viewing.

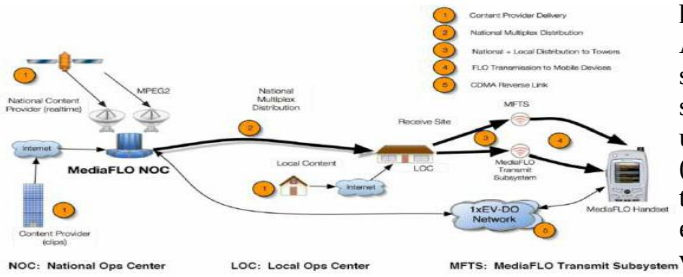

Fig 8: MediaFLO (1)

4. COMPARISION BETWEEN DIFFERENT TECHNOLOGIES

Table 1:- comparision between different technologies**.**

	DVB-H	DMB	MBMS	MediaFLO
Type	Broadcast	Broadcast	Cellular	Cellular
Region	US, Europe, Asia	North America, Europe	US, Europe, Australia, Asia	US
Developer	Open Standard	Open Standard	IP Wireless	Qualcomm
Operator Support	Telstra, O2, 3 Italy, Swisscomm	BT Movio, Virgin Mobile	Orange, BT, TeliaSonera, TIM	Verizon, Sprint Nextel
OEM support	Nokia, Motorola, BenQ, Siemens	LG, Samsung	Ericsson	Samsung, Nokia
Network	DVB Terrestrial	DAB Terrestrial and Satellite	GSM, EDGE, UMTS	CDMA, EVDO
Channels	9-18	8-12	50	15-20
Frequency	UHF non allocated	Existing DAB Frequencies	3G Spectrum	Qualcomm's own (US) 700MHz

5. PRESENT SERVICE PROVIDERS

Alcatel's unlimited Mobile TV (6)

Alcatel's solution for mass market mobile TV consist of a mix of nicest and broadcast technologies – a solution that employs hybrid satellite/terrestrial architecture. This 3G friendly architecture allows mobile operators to protect and leverage their 3G investments, while cooperating with other industry players to take full advantage of the booming mobile TV market. It 's solution provides mobile user with a high-quality mobile TV service on mobile phones and other devices- any time, any place. With this solution, operators can offer a large number of TV programs, in one or several countries, with superior quality of indoor coverage. The result is a universal solution, which offers an unlimited number of channels, an unlimited audience with unlimited coverage and maximum interactivity, and guaranteed unlimited usage.

Bharati Telesoft's Video Delivery Platform (7)

Bharati Telesoft's VDP hosts, manages, and delivers multimedia (video, data and voice) content right to the mobile handset- quickly and efficiently.

As the demands for up-to-the minute content multiply, VDP scales to handle growing volumes of concurrent video sessions and increasing demands for content download- and upload. With Bharati Telesoft's Video Delivery Platform (VDP), mobile operators can provide call based video services to subscribers, and store and manage video content. VDP enables subscribers to make video calls, access video content via a video portal, send video messages, and engage in video chat.

Cyber-Link Mobile TV Solutions (8)

Cyber-Link mobile TV solution provides support for a growing range of a popular standards and operating system. Mobile TV player provides automatic switching between DVB-H, DVB-IP and T-DMB standards, enabling a hassle free solution for mobile TV users who move between countries. Support for conditional access and digital rights management gives users a wider selection of accessible TV content via pay-TV subscription services. Eg: NOKIA N92i, LG U900, NOKIA 7710, SAMSUNG SGHp900 etc.

Fig 11: Noki, LG U900a 7710, Nokia N92, SAMSUNG SGH P900

BSNL MOBILE TV SOLUTIONS (4,5)

BSNL announced a launch of mobile TV service on 5th June 2009 which is also called as tiny TV.BSNL, India's leading GSM Mobile operator, along with M/s. Apalya Technologies Pvt. Ltd. announce launching of an end to end mobile video solution for providing world class TV through GSM mobile Handsets, called **mimobi.tv,** to BSNL's EDGE/GPRS/Portal customers in the Eastern Zone (W. Bengal, Sikkim, Bihar, Orissa, Jharkhand, A&N, Assam, Meghalaya, Tripura, Manipur, Aizwal, Arunachal & Nagaland). Apalya Technologies has tied up with leading media companies like NDTV, AAJTAK, CNBC, CARTOON NETWORK, TIMES NOW, ZOOM, BINDASS, ETV, TV9, MAATV, INDIA TV, CNN-Mobile (more TV channels will be introduced in phases) to deliver wide varieties of contents for the end to end mobile TV & video solution to BSNL's EDGE/GPRS/Portal Customers. The subscribers will be able

to watch both **Live TV** and **On Demand Video**.

6. CONCLUSION

Mobile TV undoubtedly, is a hot topic today. It is about to become the next big thing in entertainment mass market. Numerous problems- frequencies, services, and different technologies are also not yet finally solved, nor is yet fully clear, if and how Mobile TV could become a business, to what extent users will accept the new medium, and how they could be charged for mobile TV services. Mobile TV will be killer application in the next generation of mobile phones, creating a new convergence paradigm of broadcast and mobile services

REFERENCES

1) http://www.rohde-schwarz.com/www/pt_cont.nsf/file/R_S_MTV.pdf/$file/R_S_MTV.pdf
2) http://www.3g4g.co.uk/Other/Tv/Presentations/mobile_tv_introduction.pdf
3) http://search.bbc.co.uk/search?go=toolbar&uri=%2F&q=mobile+tv+news
4) www.wb.**bsnl**.co.in/**mobile**/**mobiletv**.html
5) http://telecomtalk.info/bsnl-launches-mobiletv/4890/
6) http://www1.alcatel-lucent.com/mobileTV/doc/Alcatel-Lucent_Unlimited_Mobile_TV_brochure_Nov2007.pdf
7) http://www.eurocomms.com/online_press/112647/Bharti_Telesoft_to_showcase_integrated_VAS_solutions_at_Mobile_World_Congress.html
8) http://www.cyberlink.com