

Market Analysis:

Mobile TV: A battle between standards in an uncertain market, and a proving ground for profitability in a changing market

Date: May 23, 2008

Authors: Lorenza Brescia, Dave Dunphy

Basis for topic:

Brussels recently officially endorsed DVB-H as the mobile TV technology of choice in Europe. This means that member states are now required to "encourage" the use of this technology. The ruling is no surprise - as it was proposed in July of last year, and the requisite countries signed up in November. So this was fully expected, if not entirely welcome by all...as there have been mixed feelings amongst vendors both about the technology, and on the role of the EU in telecom regulatory issues.

In the UK, both T-Mobile and Orange are about to launch trials using the competing **UMTS MBMS (Multimedia Broadcast Multicast Service) based TDtv technology**, which utilizes existing **3G networks** and spectrum. The technology for that trial is being provided by NextWave Wireless.

The new EU directive states that member States shall encourage the use of the standards and/or specifications, and points out that DVB-H is now an endorsed standard. But MBMS is already part of the GSM (3G) standard, which is endorsed by ETSI (the European Telecommunications Standards Institute).

So, member nations could find themselves required to promote two separate video transmission standards for a service that has to date proven hard to commercialize, and which at least in the short-term has seemed to be more of a vendor and service operator "push" rather than a market "pull." What impact might this have?

Analysis:

Two important major issues in the development of the mobile TV market are the number of **technology approaches** used, and the **diversity of the solutions** by geographic region. Fragmentation in the industry could make it difficult for any player to reach the economies of scale necessary to succeed, so having competing technology approaches continue within the EU is potentially undesirable. Both MBMS and DVB-H supporters might agree on that - but certainly will disagree on which technology should come out the victor.

Operators must examine several areas to determine the viability of a technological solution with consideration given to the cost of the network, spectrum use, and whether standards are available. For instance, equipment costs can be driven up by a technology that requires more transmitters and sites in order to provide adequate coverage. Still other technologies may require separate spectrum and offer better spectral efficiency because of the type of air interface implemented (i.e., OFDM). With a plethora of technology choices, the decision process can be daunting, especially where some technologies lack concrete implementation data to use in the business case model, due to limited commercial exposure (i.e., MBMS, TDtv).

With the proliferation of technology options comes a diversity of regional offerings, which are impacted by both regulation and spectrum availability. The EU's strong endorsement of DVB-H is intended to drive standardization by operators - as well as take advantage of existing spectrum. This is not surprising, given that the EU has reportedly invested roughly €40 million in DVB-H's development. And Europe has been a hotbed of DVB-H trials and commercial implementations. But at the same time, in the UK both T-Mobile and Orange are about to launch trials using the competing UMTS MBMS (**Multimedia Broadcast Multicast Service**) based on TDtv technology.

Meanwhile, Qualcomm has been successful in promoting FLO within the U.S. with a commercial launch at Verizon Wireless and another one to follow with AT&T. The issue in the U.S. is more about operators believing that there is adequate market demand. So far, there seems to be a bit more confidence in Europe. But beyond the U.S. and Europe, the most watched market is China. The Chinese are leaning towards CMMB, a hybrid solution similar to DVB-SH, with the potential to launch the probably largest mobile TV coverage in the market.

We have all heard the promises surrounding mobile TV, which has been billed as the "next big thing" following mobile data. One argument has suggested that video streaming of TV programming to mobile devices will increase traffic on existing 3G networks to the breaking point; another is that the "traffic-intensive" mobile TV is the "killer app" that will justify the business case for moving to 4G.

But market-wide, despite a couple of individual operator successes, uptake in mobile TV deployments have been tepid at best, and successful commercialization of the model needs greater development. Though in the long-run, with proper development, this market may be created, we think that current market sizing hype abounds. We have seen published estimates that nearly half a billion users will be watching TV on their mobile devices by 2015.

Currently, we do not appear to be on track for that quick of a ramp. The bulk of the market today is primarily engaged in trials or planning for them, and those are often slow in turning into commercialized rollouts - with some geographic regions stronger on the uptake. But there is definite interest in developing this market worldwide - Italy, U.S., France, Japan and South Korea are contributing to the growing momentum. If anyone can "crack the code" on commercializing mobile tv, regardless of what standard it is based on, that will go a long way toward getting service deployment on track to result in the currently over-ambitious revenue forecasts.

But beyond learning how to develop the right mix of content, applications, and advertising, the success of mobile tv will also depend on a reduction in the

diversity of solutions. This market is still in its earlier phases and is far from having achieved a consensus. For "on-net" solutions, it seems that European penetration is still a goal for Qualcomm, which is eager to prove that FLO is more than just a regional U.S.-based phenomenon. And DVB-H supporters have not given up entirely on the U.S. market, either, not putting too much credence in Crown Castle's failure with Modeo.

For the off-net solutions, Ericsson has been a key supporter of MBMS, but it has been recently quite silent concerning launches or trials - and no new products have been announced lately.

NextWave needs to recruit additional TDtv and MXtv ecosystem partners to drive adoption of their solutions. The vendor has announced so far support by Alcatel-Lucent and Huawei and has one trial underway for TDtv with Orange and T-Mobile in the UK. Those vendors supporting MBMS need some fast progress on trials in order to dissuade operators from implementing competitors' DVB-H solutions that are already in commercial launches.

We are also waiting for standardization of mobile TV solutions for LTE and WiMAX by the 3GPP and WiMAX Forum, respectively. Standardization is important for establishing an ecosystem of supported components and devices. Operators are increasingly looking forward to 4G, but are hesitant because they are still trying to get their hands around the total cost, return on investment, and complexity of implementation. Mobile TV becomes a more promising opportunity as 4G roll outs occur, but standards solidification will be necessary to make this a reality.

Nearly every major wireless infrastructure vendor now has a mobile TV offering. Given the fragmentation in this emerging market and some very conflicting planning assumptions proposed by vendors with regards to demand, number of channels required, and 3G's ability to provide enough spectrum or overlay networks' ability to prove cost effective - operators are struggling to determine which mobile tv technology (if any) will prove the most profitable in the short-term. Can the nascent mobile TV market sustain so many technologies? Will one win out, will several coexist, and will new ones emerge?

Standardization, at least on a regional basis, may be critical. Large volumes will be needed in this market, because price sensitivity of subscribers is a very significant market inhibitor to overcome - at least in the short-term, before operators learn the "secret formula" of content, applications, and commercialization required to make a service that operators have strong interest in one for which operators also have strong confidence from a business case standpoint.

At some point, dissenting factions can be counter-productive...a topic of heated debate recently in the U.S. Democratic party's presidential election nominee selection process. Within the Democratic party, it might be good for the party overall in the long-term if it were to reduce the number of choices - but it is not necessarily good for the individual candidates in the short-term, and without that mutual incentive, consolidation among candidates has been hard to achieve. This is similar to the situation between competing DVB-H and MBMS supporters. No one will give up until after it is obvious they have lost.

The difference in this case, however, is that for the long-term success of the mobile TV market to become a reality, we need a more compelling business case in

the short-term to "get the ball rolling," so that operators and vendors can experiment, and "get it right." With the incredible price sensitivity that mobile subscribers in most trials have been showing, some consolidation on mobile tv technologies in order that the market can benefit from the cost advantages of greater volumes and operators feel like they are taking on less risk may be needed to ensure that enough deployment happens so that enough experimentation with service offerings happens that development of a more profitable commercial model in the long-term becomes inevitable.

Although vendors are divided over which options to support, a majority today support DVB-H. But some of the larger players in mobile have their eyes on MBMS as 4G approaches. Mobile TV interest is at an all-time high in 2008 - but vendors still need to convert that elevated interest into greater deployment in order to recover development costs before interest in the technology wains in the face of the challenges that need to be overcome. That will involve proving to operators that it can be a replicable commercial success in the foreseeable future. Part of those proof points will have to come from creative commercialization techniques - which is a major challenge. Another potential means would be to gain stronger consensus on technology to bolster operator confidence and reduce costs - which is less likely to happen in the next six months than it is for Hillary Clinton to concede the nomination to Barrack Obama in the next six minutes.

What can - and must - happen for this market to succeed is for vendors to work very hard on helping operators negotiate a viable commercialization model with the content providers and potentially broadcasters and advertisers. Mobile TV is a huge opportunity that can potentially be created - but it is not one that is guaranteed to happen at all. There is a lot of complexity to it, complexity that many operators have less time to address than they may need.

Making Mobile TV a wide-scale commercial success is going to require a lot of market development expenditure and creativity on the part of vendors...and this is going to have to be built into their business cases....regardless of which technology they choose to back. In the case of Mobile TV, the real hurdle to overcome is successful commercialization, not technology. There are quite likely going to be viable competing technical alternatives. Vendors need to make sure not to lose sight of the "forest" of commercialization due to concentrating too much on the "trees" of technology. True, they have to win that battle also; but even if they win that first battle, they could lose the second one if they have not laid enough groundwork to ensure that they are offering mobile operators compelling revenue streams and strong business model, in addition to offering viable underlying technology at reasonable TCO. If a vendor offers both, then 1+1 will equal 3; if they offer strong technology alone, 1+0 may equal 0.

In the past, we have been in a market where technology constrained our offering enough bandwidth at low enough prices to enable existing applications that subscribers or Enterprises knew they would want to implement - if only it were possible at reasonable cost. Now with the bandwidth bottleneck opened, we are fast moving into a "new frontier" with mobile TV leading the way among services. That "new frontier" is a market where profitability may increasingly require that operators develop the capability to show and sell subscribers on new services that they never imagined needing, and where vendors will have to work with those

operators to help them create a business model based on something other than their recovering costs by charging for bandwidth.

Background

Mobile TV can be implemented either **On-Net** via a 3G network (in trials and under discussion at large incumbent providers), or using **Off-Net** overlay solutions using several competing technologies such as DVB-H, DVB-SH, MediaFlo (Qualcomm), T-DMB (Korean), S-DMB, and TDtv (IPWireless' solution based upon MBMS).

Whereas off-net services are limited to broadcast TV, on-net services enable interactive TV services such as VOD or personalized video services. Many telcos are investigating a hybrid service model, combining off-net and on-net services to leverage the most optimized technology. In Italy both TIM and H3G have announced DVB-H services, complementing their already launched on-net (3G-based) mobile TV services, while Vodafone Italy launched its own third DVB-H network with Mediaset.

However, even within a country, the off-net services can take different forms. In Germany, Debitel (n°4 German mobile operator) is using T-DMB whereas Vodafone rolled out DVB-H. In the US, Qualcomm launched a nationwide off-net mobile TV service and has thus far signed with Verizon Wireless and AT&T. This broadcast network will be based upon Qualcomm's technology, MediaFlo, using frequencies up to now reserved for analogue TV which, incidentally, is scheduled to be totally closed by 2009. Clearly, what will be the business model and the operators' precise role for off-net services is not definitively defined yet.

As for on-net (i.e. EV-DO or W-CDMA) solutions in the US, all major operators are active. Verizon Wireless, Sprint and Cingular launched on-net mobile TV services using MobiTV's hosted services. MobiTV is a startup specializing in the program guide/interactivity part, providing a complete on-net solution and services. All these offers provide both VOD and live TV in a streaming mode. As of today, MobiTV reported 3 million active subscribers globally (including 3 UK and Orange UK), from 1 million at the end of 2006.

Nokia has been a fierce proponent of DVB-H, a technology in which it holds considerable patent rights, to the point of building handsets before any service existed and contributing financially to network-operator-led trials. Samsung has, meanwhile, been doing much the same thing with DMB. Having convinced the South Korean Government to mandate DMB, the company has since been financing large-scale trials in Europe and elsewhere.

All three technologies (DVB-H, DMB and MediaFLO) are capable of providing a decent broadcast video experience, and can be slotted into the TDD frequencies currently lying idle in many countries, so this argument is becoming less about technology and more about patent rights and politics.

Technologies

Mobile TV is comprised of a number of competing transmission technology standards. Each technology is championed by a host of players including standards organizations, vendors and even countries; resulting in a fragmentation of

standards that confound potential mobile TV operators. For example, mobile broadcast/multicast services have been specified in 3GPP and 3GPP2 for use in cellular networks such as UMTS and CDMA2000 (i.e., MBMS). Similarly, new broadcasting technologies have been developed that leverage existing digital broadcasting services and are tailored to the mobile environment (i.e., DVB-H). The following is a list of the principal technology options currently available.

DVB-H (Digital Video Broadcasting for Handhelds) is derived from the DVB-T standard. It benefits from time slicing, which conserves battery capacity on terminals. Key proponents are DVB Project, Nokia and the European Union. It is used for Broadcast. Present in Europe, parts of Asia, parts of South America

DVB-SH (Digital Video Broadcasting- Satellite Services to Handhelds) is also derived from DVB-T. It is a hybrid satellite/terrestrial system using satellite to achieve coverage of large regions or whole countries that uses the S-band. Key proponents are DVB Project, Alcatel- Lucent. It is used for Broadcast. Available in U.S., Europe, parts of Asia

FLO (Forward Link Only), is a QUALCOMM developed packet data technology that benefits from improved statistical multiplexing and layered video coding techniques. Key proponents are QUALCOMM and FLO Forum. It is used for Broadcast and available in U.S., UK, Japan, Taiwan, Hong Kong, Malaysia

ISDB-T (Integrated Services Digital Broadcasting - Terrestrial) is a DTV packet data technology. Key proponents are: NHK Labs., Digital Broadcasting Expert Group (DiBEG). It is used for Broadcast and available in Japan, Brazil

MBMS (Multimedia Broadcast Multicast Service) is standardized by 3GPP for use with GSM/UMTS Networks. It is used for Broadcast/Multicast over GSM/UMTS and WCDMA network. Key proponents are: 3GPP and Ericsson. It is available wherever UMTS is available.

TDtv is a version of MBMS developed by vendor IPWireless It is used for Broadcast/Multicast over **TD-CDMA network**. It is available in Europe

BCMCS (Broadcast and Multicast Services) is a version of MBMS used for Broadcast/Multicast over **CDMA2000** networks. Key proponent is the 3GPP2. It is available wherever CDMA2000 is available.

T-DMB (Terrestrial Digital Multimedia) is derived from the European DAB and modified for multimedia. It is used for broadcast. Key proponents are SK Telecom, Samsung, LG. It is available in South Korea, China, and Germany

S-DMB (Satellite Digital Multimedia) is used for Broadcast and proposed by Toshiba in Japan

CMMB (Chinese Mobile Multimedia Broadcasting) is based on home-grown standard STiMi (satellite and terrestrial interactive multiservice). It is used for Broadcast and proposed by the Chinese State Administration of Radio, Film and Television (SARFT)

ATSC mobile (Advanced Vestigial Sideband) is derived from the ATSC standard to support mobile devices. It is used for Broadcast and available in US

Vendor Solutions

Alcatel-Lucent offers the Unlimited Mobile solution that includes products from ALU and partners for encoders (TeamCast), encapsulators (UDcast) and mobile devices (Sagem, Samsung). It supports DVB-H and DVB-SH technologies. Main customers as today are: SFR, ICO (U.S.) and 3 Italia/RAI

Cisco solution combines Cisco, Scientific Atlanta and partner products (Envivio, UDcast). A strong point of the solution is the network monitoring capability. It supports DVB-H technology.

Ericsson Provides a solution that includes products from acquired Tandberg (head-end equipment) plus middleware, mobile access nodes and content management. Device support is available thanks to EMP. MBMS is the primary focus of the solution with support for GSM and WCDMA, but it supports also DVB-H. Customer: Cellcom Israel

Huawei provides all components for a Mobile Multimedia Broadcast Solution that uses both MBMS and CMMB, including support for SGSN/GGSN. Customer: PCCW (Hong Kong)

Motorola provides a DVB-H solution that includes video delivery head-end systems, handsets and RF transmission.

NextWave solution is a modular network that utilizes UMTS and WiMAX networks. It supports TDtv and MXtv technologies. Customers: Orange (UK) and T-Mobile (UK)

Nokia/ Nokia Siemens Networks provide a modular platform that can support Nokia's DVB-H IP datacasting solution, or MBMS. Key differentiator is the ability to provide devices as well as network equipment. Customer: MiTV (Singapore)

QUALCOMM Powers the MediaFLO ecosystem, Qtv content development system, WCDMA MBMS and chipsets for handset and base stations. The vendor has support for all broadcast technologies, but a strong focus on MediaFLO. Technologies supported: FLO, MBMS, DVB-H and ISDB-T. Customers: Verizon Wireless, AT&T, PCCW

Thomson provides a solution for most broadcast technologies: transmitters, head-end and content management. Has the added benefit of providing content production equipment to content providers. It supports: DVB-H, FLO, T-DMB and CMMB. Customers: TVi Portugal, Vodafone Portugal, TIM Italy, Albavision