

U.S. Mobile TV: Learning from Europe and Asia

A DTC White Paper



Digital Tech Consulting, Inc.

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Introduction

Unlike their Asian and European brethren, U.S. terrestrial broadcasters have yet to test the mobile TV waters. That's about to change as the ATSC and industry proponents prepare a transmission system that will put U.S. broadcasters on the mobile TV map.

In this paper, we examine courses taken by broadcasters in Japan, South Korea and select Western European countries with an eye toward what U.S. broadcasters and mobile service providers can learn from these experiments turned into commercial services.

Four critical areas, in no particular order, are examined here. A careful study of each of these areas is mandatory for building a successful mobile TV ecosystem and business:

- **Technology.** There are multiple factors to consider in technology selection with the most important being the implementation of a spectrum-efficient system. Other technology considerations include the adoption of an in-band transmission system and the use of standards-based compression and transport technologies.
- **Content.** A careful selection of content will be critical as U.S. consumers have a plethora of visual entertainment programming choices. Content providers must decide whether they want to merely repurpose existing content, or modify and/or create content designed specifically for mobile viewing.
- **Regulatory.** The process of reaching a standard lies first with the ATSC, which is reviewing proposals for the ATSC M/H standard. Because the ATSC M/H standard will be designed to work with terrestrial broadcasters' existing spectrum, the FCC will not be called upon to allocate or manage additional spectrum.
- **Business models.** Broadcasters must carefully weigh the merits of each business model with the acknowledgement that mobile TV is a service that significantly differs from their stationary terrestrial TV services. An examination of business models employed by

broadcasters in Japan, South Korea and select Western European countries is examined here.

Technology

The U.S.'s mobile broadcast TV standard will be based on the current Vestigial Side Band (VSB) technology employed for fixed digital terrestrial TV transmissions and will require the ability to transmit a mobile TV signal within the 6 MHz of spectrum each terrestrial broadcaster is allotted after February, 2009.

Of course, spectrum efficiency is only one of the important technical elements that encompass the mobile broadcast TV ecosystem. Robust reception to accommodate moving receivers in a variety of land and urban scapes, battery-efficient handsets, and the ability to accommodate third-party conditional access or DRM systems are also important technical elements. The table below identifies transmission technologies used throughout the world to facilitate mobile broadcast TV transmissions.

Table Of Existing Mobile Broadcast TV Transmission Standards

Transmission Technology	Spectrum Use	Adopted Or Proposed Countries
T-DMB	Out of band	Korea; China for temporary use
S-DMB	Satellite transmission	Korea
ISDB-T	In band	Japan and Brazil
DVB-H	Out of band. Spectrum not readily available in many cases.	EU countries; fully commercial deployments in Italy (UK, France, Germany, Finland, Austria, France, Switzerland and Spain between trial and commercial launch)
A-VSB	In band	U.S. (proposed and if selected will be ATSC M/H)
MPH	In band	U.S. (proposed and if selected will be ATSC M/H)
Thomson proposal	In band	U.S. (proposed and if selected will be ATSC M/H)
MediaFlo (not an open standard)	Out of band	U.S. (proposed and if selected will be ATSC M/H)

Source: Digital Tech Consulting

A couple of anomalies exist in the table above. The Korean S-DMB technology is a satellite-based transmission and is not designed to be used by terrestrial broadcasters, although terrestrial repeaters are used to boost the signal range. But because the technology enables a service that is very similar to one that is provided by terrestrial broadcasters, Digital Tech Consulting (DTC) has included it here. And, although Qualcomm's MediaFlo system, which has been commercially rolled out by Verizon, is a broadcast technology (delivering a single signal to multiple receivers over the airwaves), it is being aimed at wireless carriers that are looking for an efficient way to deliver TV programming to its mobile phone-service subscribers. In this case, the provider is not a traditional terrestrial broadcaster, the service – although combined with mobile phone service – is similar to those available from broadcasters.

As with most emerging technologies that DTC studies, we believe the adoption of open standards vs. proprietary systems is a critical ingredient for adopting new consumer digital technologies. The proposed transmission technologies before the FCC are based on the current ATSC fixed digital terrestrial TV standard, which will promote a relatively quick design and manufacture of receivers and broadcast equipment based on existing standards.

Along with the adoption of open transmission standards comes the adoption of other standards from audio/video compression and transport technologies to file format and transcoding protocols. The adoption of an open transmission standard will create a natural path to the selection of other open-standards technology.

Content

The type of content available among the commercially available mobile TV services typically varies by the business model employed by the provider. In most cases, content is a form of repurposed or duplicated existing general entertainment and information TV programs. In some cases, especially for the T-DMB systems in Korea, interactive elements that can facilitate transactions and navigation are imbedded in the programs.

To date, the type of TV program usually depends upon the “pay or not pay” status of the programs in the “fixed” transmission world. In Italy,

for example, where users pay a subscription or per-transaction fee for the mobile TV service, sports programs (namely football) are an important ingredient in the programming lineup. In Japan, where the One Seg service is available and free to viewers, content is the ad-supported programs that broadcasters transmit on their fixed transmissions. In the U.S., where Verizon makes its MediaFlo-based Vcast service available and viewers pay subscription fees, select basic cable TV channel lineups populate the service.

U.S. broadcasters, of course, have a ready bank of programming by merely duplicating their fixed transmissions. In this case, program acquisition presents no barriers. But in the case of broadcasters planning services for which viewers must pay a subscription or transaction fee, programming must be acquired from rival cable networks, movie studios, or independent program producers who don't have a built-in distribution pipeline. One of the more promising scenarios for U.S. local broadcasters is to provide heavily localized programs for news, weather, traffic, sports, and community topics.

Regulatory

Arguably, one of the most important aspects of a new mobile terrestrial TV service is the ability of broadcasters to implement the service within their current allotted spectrum. The proposals that are being considered satisfy this requirement guaranteeing that no additional spectrum need be allocated.

In Europe, where out-of-band technology is used, the availability of spectrum set aside for DVB-H services is scarce and has contributed to the slower-than-anticipated rollout of DVB-H services. In the U.S., where the concept of viewing video on mobile devices (other than in-car devices) is unproven, acquiring additional spectrum may have been more of a financial risk than many broadcasters would have wanted to take for this emerging technology.

The primary proposals being considered for the ATSC Mobile/Handheld (M/H) standard take different approaches to broadcasting mobile TV. Despite the competition for selection, the possibility of a "Grand Alliance" for mobile TV is on the table. Like its predecessor, ATSC for fixed terrestrial transmissions, the mobile ATSC standard would be an

amalgamation of cherry-picked technologies from multiple proposals that result in a single standard. Because many broadcasters are advocating having a standard selected by February, 2009 when analog TV will cease in the U.S., a Grand Alliance scenario may not be the best approach as it will likely slow the adoption of a single standard.

That may be a moot point, however, as plans to develop receiving devices, test transmission technology, and begin broadcaster trials are going forward despite the fact that the FCC has yet to name a transmission standard. Mobile TV advocates inside group broadcasting companies are keen to be ready to implement mobile TV transmissions before the analog TV shut-off occurs in February, 2009. The cessation of analog broadcasts will theoretically free up money in TV station budgets as analog equipment upkeep and the resources needed to operate an analog TV service disappear. There will be plenty of other stakeholders inside these organizations campaigning for those supposedly available dollars. In addition, the newly available spectrum as a result of the analog TV shut off is being purchased by mobile-phone service providers who could roll out competitive services. A late start could hobble terrestrial broadcasters' ability to be competitive.

Business Models

Although U.S. broadcasters can learn from the business models adopted/ tested by broadcasters in Japan, South Korea and, select Western European countries, they will have to make a careful study of the market differences between these early-adopting nations and the U.S. The table below outlines how current mobile TV broadcasters are generating revenue.

Business Models

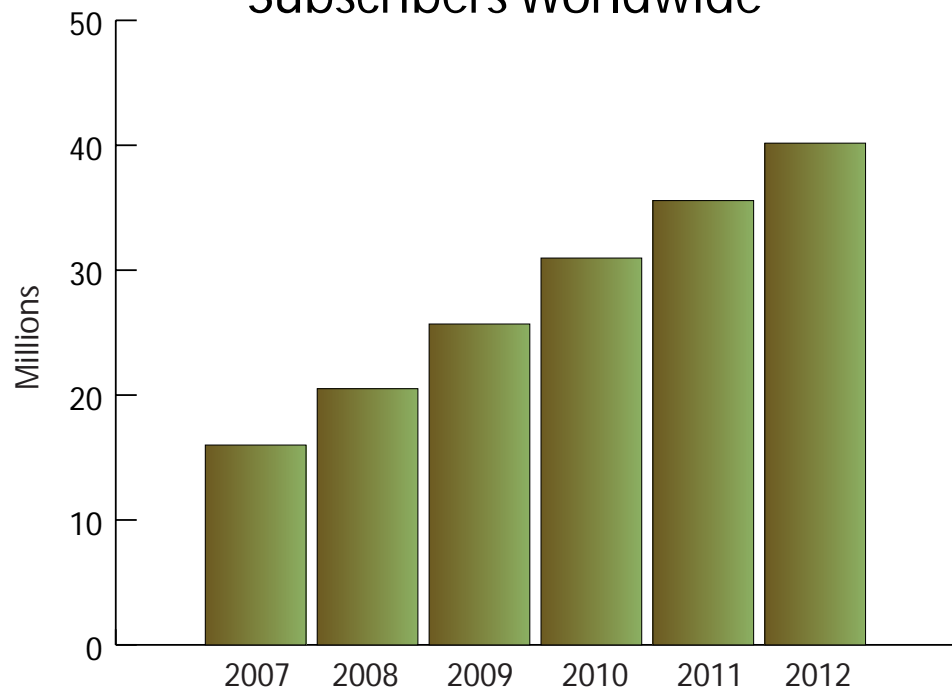
Business Model	Used By	Relevance For U.S. Broadcasters
Ad supported; no subscription fee	One Seg broadcasters in Japan; T-DMB services in Korea	Traditional U.S. terrestrial broadcaster model. Would rely on network content and locally produced content
Ad supported; no subscription fee but bundled with a mobile telephony service subscription. Could also include carriage revenue.	Mobile phone service providers in Japan by distributing mobile phones that include One-Seg receivers	Terrestrial broadcasters could partner with pay services (i.e., MediaFlo services) to provide free local content (news, weather, etc.) to supplement pay TV content
Subscription fee	DVB-H service providers in Italy; MediaFlo service provider Verizon in U.S.	Would rely on high-value locally produced content or must acquire high-value content from third-party provider
Subscription fee with supplemental transaction fees	Satellite DMB provider (subsidiary of SK Telecom) in South Korea	Would require a back-channel transmission suggesting it would have to be coupled with a point-to-point transmission
Ad supported content with supplemental transaction fees		Would require a back-channel transmission suggesting it would have to be coupled with a point-to-point transmission

Source: Digital Tech Consulting

Worldwide uptake for subscription-based mobile TV has been fairly modest. Services, however, are relatively new and have not rolled out on a broad basis. In Western Europe, Italy has viable and fully commercial DVB-H services but most other European DVB-H services are in trial phases. Verizon has not made public subscriber numbers for its Vcast service, which uses Qualcomm's MediaFlo technology, but it is widely assumed that subscriber numbers are modest. AT&T has announced that it will begin selling its MediaFlo service in 2008 but few details are available as to how many markets in which the service will be available.

DTC estimates that there will likely be about 20 million worldwide subscribers signed on to a pay mobile TV broadcast service in 2008 growing to more than 40 million in 2012 (below) There will be many more subscribers who will pay for video services in conjunction with their mobile phone 3G service. The estimates below are only for point to multipoint broadcast transmission.

Mobile Broadcast TV Subscribers Worldwide

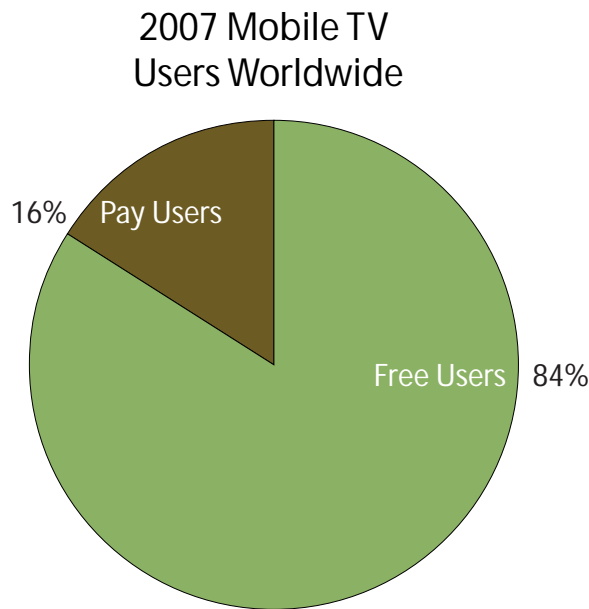


Source: Digital Tech Consulting

The number of users who have access to a free broadcast service, however, is much greater. DTC estimates that in 2007 nearly 85% of all broadcast mobile TV users worldwide had access to free, ad-supported services, while about 16% accessed pay services (below). The majority of free service users are located in Japan and South Korea where the One-Seg ISDB-T service and the T-DMB service are very popular. Tens of millions of handsets and other devices with One-Seg and T-DMB receivers ship into the marketplace annually.

This cannot, however, be confused with the number of consumers viewing the broadcasts. Many of the handsets are distributed by and receive phone transmissions from mobile phone service providers. The TV receiver is an added bonus, but not necessarily used by all device owners. Reports from

industry players in Japan and Korea, however, report that the service is quite popular.



It also must be pointed out that there is a similar hardware distribution model for handsets that are designed to only receive mobile TV services when the handset owner pays a subscription fee. Because some chip designs incorporate the reception of multiple transmission technologies, many handsets are shipped with the ability to receive, for example, MediFlo transmissions.

Source: Digital Tech Consulting

In this case, however, only paying subscribers have access to the mobile TV service.

The inclusion of reception for free services, however, gives the ad-supported model a leg up. And, in the U.S., where consumers are already paying monthly subscription fees for multiple services and are not as likely to fit the commuter profile for a likely mobile TV viewer, DTC believes broadcasters must tread carefully into the subscription-fee waters.

Because the primary competing transmission technologies are developed by sets of handset and TV makers with broadcast-equipment suppliers (Samsung & Rohde & Schwarz, and LG Electronics & Harris Broadcast), it's likely that there will be a substantial installed base of mobile and in-car devices that will receive a variety of transmissions, including the yet-to-be-determined mobile ATSC M/H standard. It's not a guarantee of high numbers of viewers but it is a legitimate springboard to launching successful ad-supported transmissions – the business model that may have the greatest chance of success in the U.S. where signing up multiple-media-subscription consumers to another service might be a tough sale.

Mobile TV is just one of the many fields Digital Tech Consulting follows on a regular basis. To find out about more detailed custom research and analysis on the Mobile TV market, or any other market we follow, please contact:

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Mobile TV Acronyms

3G	Third Generation
ATSC	Advanced Television Systems Committee
A-VSB	Advanced Vestigial Side Band
DMB	Digital Multimedia Broadcasting
DRM	Digital Rights Management
DVB-H	Digital Video Broadcasting – Handheld
FCC	Federal Communications Commission
ISDB-T	Integrated Services Digital Broadcasting -Terrestrial
M/H	Mobile/Handheld
MPH	Mobile Portable Handheld
S-DMB	Satellite – Digital Multimedia Broadcasting
T-DMB	Terrestrial – Digital Multimedia Broadcasting
VSB	Vestigial Side Band