STATION RESOURCE GROUP

The Mobile Internet: A Replacement for Radio?

A briefing memo for executives and board members of the Station Resource Group

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In a mixed delivery environment that will be with us for years to come, listeners will seek the content that is important to them on the best available device in a given situation. Public radio will do best by offering multiple services on multiple platforms, each service crafted to patterns of use for the respective method of delivery.

Public radio should aim for a portfolio of delivery strategies – a continuing place for broadcast, an expanding role for wired and wireless Internet radio, and emerging technologies that synchronize multiple paths to create a more robust user experience.

And just ahead: the need to offer compelling visual content to complement your primary audio service.

There has been considerable and passionate discussion of late over the potential for streaming media on the Internet – particularly in its wireless form – to overtake and replace the existing technology of AM and FM radio broadcasting as a method of presenting audio content to consumers.

Such forecasts have rightly caused many public radio broadcasters concern over how they should prioritize their current and near-future investment priorities. These concerns can be summarized in the question, "Is the wireless Internet a replacement technology for radio broadcasting? "

Unfortunately the answer is not straightforward today, but it appears to be closer to "no" than to "yes" from our best, current vantage points. The environment remains quite dynamic even as this is written, but there are some touchstones that seem relatively unassailable to support the conclusion that the wireless Internet will not truly replace radio broadcasting.

Nevertheless, there is also substantial evidence that the mobile Internet's impact on radio broadcasting will be significant, and that it should by no means be ignored by broadcasters.

The best current understanding of the question can therefore be gained by examining the broader context of the environment that engenders it. The following analysis considers the salient points of that space, then draws certain conclusions on the fundamental issues of what public radio should be thinking and doing about its future delivery systems today.

Wired (or "Fixed") Internet Radio

For the better part of the past decade, Internet radio has slowly grown its services and audience, with most listening during that period taking place on wired PCs. The increasing deployments of consumer broadband connectivity, flat-rate service plans, and WiFi technology[1] over that same timeframe have enhanced the popularity of Internet radio, to the point where today over 60 million Americans listen to some form of Internet radio in a typical week.[2]

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[1] Although WiFi is a wireless distribution method, it is essentially a short-distance (LAN) extension of a wired Internet connection, and is thus, for purposes of this discussion, considered part of the wired (or "fixed") Internet radio environment. This is in contrast to the longer distance (WAN) wireless broadband Internet connections more recently provided by telcos, giving direct service to handheld devices via 3G and other connectivity. The distinction is important in this context because the latter are far more similar to radio broadcast services due to their fully "un-tethered" nature.

[2] Bridge Ratings LLC, *Streaming Listener Trends*, February 2010.

Appliances

A more recent phenomenon has brought Internet radio closer to being directly competitive with radio in the wired Internet environment. It is the emergence and quiet growth in popularity of Internet radio "appliances" – devices that look and act like tabletop or clock radios, but include wired and/or WiFi Internet access that is used exclusively to present Internet radio streams. Importantly, some of these devices include AM and/or FM broadcast radio receivers, and some do not.

Wireless (or "Mobile/Portable") Internet Radio

A substantially different environment from the above is now emerging, in which Internet radio streams are available via fully wireless means. This puts Internet radio much closer to parity with broadcast radio, at least in terms of the locations in which it is available.

It is expected that such broader access will increase the growth rate of Internet radio usage, although such trends are countered by the cost of service, availability and cost of devices, and complexity of usage for Internet radio listening.

At present, it is too early to extrapolate with much precision what kind of uptick in Internet radio listening such mobile broadband usage will bring. (It is important here to avoid the practice of some analysts to overestimate the short-term and underestimate the long-term impacts of popular new technologies.) It does seem safe to conclude that Internet radio usage will continue to grow as a result of these products' and services' relatively rapid deployments, although the real impact on

listening behavior may not be felt for some time.

There are also a number of less understood and unsettled variables within this nascent environment that make prediction even more complex, as discussed below.

Handhelds

The first form factor or device class to emerge as a wireless Internet radio listening platform was the handheld broadband terminal. Products like the iPhone and various Android-based devices have proven hugely popular, and these trends show no signs of abatement (as the recent iPhone 4 introduction has indicated).

Importantly, while these products are multi-featured, almost none include broadcast radio reception capability.[3] Therefore the *only* radio services available on most of these devices today are Internet-delivered.

Apps vs. Web streams (HTML5)

Complicating matters is the fact that most Internet radio services require a specialized application ("app") to be properly or easily received on these handheld devices. Such applications must be individually developed for each operating system (e.g., iOS, Android, Blackberry, Palm, Windows Mobile, etc.), which is a labor-intensive and expensive requirement.

It also requires users to download (for free or by purchase, depending on the app) and continually update these apps, for each

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[3] This is true even though some devices (such as the iPhone 3GS and 4) actually include an FM receiver chip, but it is not activated. It is likely that this is a purposeful decision mandated by the wireless service provider with which the device is associated.

separate service they wish to listen to on their devices.[4]

This obstacle may soon dissipate, however, as the gradual release of HTML5 support in browsers and devices continues. Among HTML5's highly anticipated features is native audio support by browsers, which may eliminate the need for streaming media apps in mobile devices (and for that matter, eliminate the need for browser "plug-ins" or media players on PCs for streaming media playback).

Just when this development will occur is a complex question, since it varies by browser and by streaming media codec supported.[5] But there is at least hope on the horizon that the requirement for development of platform-specific apps for mobile Internet radio listening is not a permanent prerequisite.[6]

Automotive receivers

Most recently, new interest and initial development have emerged for in-dash mobile Internet radio. The ultimate trajectory for this trend is, of course, even more difficult to

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[4] Most public radio services have the advantage of being made available in aggregation on one or more mobile apps that have been developed by third parties to provide access to almost the entire U.S. public radio system's set of Internet radio streams.

[5] For example, Safari 4 already provides HTML5 native support for MP3 and WAVE audio formats; Firefox 3.5 already supports Ogg Vorbis and WAVE; Chrome 3 supports MP3 and Ogg Vorbis; IE8 provides no HTML5 native audio support.

[6] On the other hand, there are some advanced features provided by apps that would not be possible in native browser audio streaming, such as the search capabilities on the Public Radio Tuner. Nevertheless, these non-streaming enhancements can still be provided to mobile platforms by apps, while listening takes place natively on an HTML5 audio enabled browser.

predict at such an early time, but one important difference has already been noted: Unlike the handheld environment, it is far more likely that the in-dash Internet radio receiver will also include an AM/FM radio receiver. Thus while such technology, if broadly accepted, will likely contribute to the growth of Internet radio listening, it may not have the same negative impact on broadcast radio listening as the handheld device class has wrought.

Consider also, however, that most of the automotive Internet radio listening to date has come from radio-less handhelds plugged into vehicles' audio systems, via an iPod dock or similar interface (in some cases, ironically, feeding via the car's FM radio). This trend will also continue and likely grow, but it is still expected that most cars will continue to provide (either separate or integrated) AM/FM reception capability as baseline functionality.

Finally here, it will be interesting to observe whether and how automotive broadband platforms deal with downloadable apps, and therefore whether the issues noted in the handheld environment above regarding platform-specific apps vs. native browser audio support will eventually also apply to the automotive space.

Enhancements

Other key trends worth observing in this context are how new services and usage are influencing the design of devices used for online radio listening. This is redefining our understanding of how to answer the question, "What is a radio?"

Screens

Many, if not most new devices that include radio reception capability – whether broadcast on online (or both) – include the capability for graphical display, up to and including full-motion video in some cases. For radio services to not appear as "second-class" or otherwise deficient on these receivers, some content must be provided (ostensibly by broadcasters) for display on the devices' screens while the radio function is in use.

This is a fundamental change for radio broadcasting, and requires a deep rethinking of its content-production ecosystem. The presentation of secondary visual content alongside primary audio service may soon become an essential component of any radio broadcast that expects to remain competitive in the media marketplace.

Broadcast +/- Online

Another key trend likely to emerge soon may bring to the marketplace an increasing number of devices that include *both* broadcast radio reception and Internet access capability. While both services are massively deployed, the ability to access them both rarely appears on the same device today. This omission is unlikely to last much longer in the age of broadly converged multi-function personal devices.

Given this prediction, it is worth considering ways in which broadcast- and Internet-delivered services might work *together* to bring a rich media experience to the user. This is another fundamental change, in that up to the present we have thought about broadcast and the Internet in an "either/or" position for delivery methods. The most obvious reaction is a reduction in duplication of services by broadcasters. If local listeners can largely receive both broadcast and online services, it is inefficient to provide identical content on both platforms.

A more nuanced impact of this trend presents an option where the two mediums would operate in parallel, for simultaneous delivery of different, but coordinated, content elements to the same device (e.g., audio over FM, with dynamically synchronized visual enhancement via wireless Internet). Ideally the user will not know or care what content is arriving via which delivery path, but will simply select and consume a holistic, multimedia experience delivered in real time to such a converged device.

To enable this functionality, a method of connecting the two mediums is required. The first proposal for such a method has also recently emerged. It is called *RadioDNS*, and it is a simple technique that leverages existing elements of both broadcast and Internet technologies to allow a receiver with access to both services to connect to the corresponding web content stream when tuned to a given radio station.[7]

Development in this space is something public radio operators should closely observe. Core listeners are likely to be early adopters of systems that enable such multimedia extensions of services from their existing favorite providers.

Obstacles to a Complete Transition

While the above discussion indicates just how competitive Internet radio has become to broadcast radio, the two services remain widely divergent. One is a broadcast service and the other is a telecommunications service. This is akin to positing that a radio and a telephone are equivalent because they both produce audio.

The two services are regulated differently, pay performance royalties under separate schedules, and have wholly differing delivery architectures (broadcast being a one-way, point-to-multipoint service, and the Internet being a two-way, point-to-point connection). Regardless of their movement toward parity from the radio listener's perspective, each service offers broadcasters a different value proposition, cost-per-listener calculation and monetization model.

While such similarities to the user may allow broadcasters to apply some of their tried and true experience with broadcast radio to the provision of online service, there are many unique elements to Internet radio service, which traditional radio service providers will need to fully understand if they are to succeed equally in the online space.

Technical differences

The primary distinction between broadcast and Internet radio is one of potential audience reach. Within a given service area, broadcast radio's potential audience is unlimited. On the other hand, while Internet radio's service area is essentially unlimited, its ability to serve individual users is always finite. Regardless of how much infrastructure is developed, it is impossible for Internet radio service to reach the truly infinite scalability that broadcast radio inherently provides within its service area.

Therefore some constraint will always exist regarding audience members' access to Internet-streamed services, and this could be seen as particularly inappropriate for services produced by publicly funded broadcasting entities. Retaining at least a baseline of broadcast-delivered channels precludes such potential denial of service.

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[7] See http://radiodns.org for further details.

That said, the bandwidth requirements of audio-only service are relatively small, and ongoing codec development continues to reduce these requirements. Thus, in contrast to theoretical constraints, the *practical* limits of available Internet bandwidth may indeed be adequate to service all the users a given Internet radio service attracts in the wired environment described above.

In the *wireless* domain, however, additional constraints apply. Even though a given Internet radio channel's server architecture and Internet backbone requirements may be adequate to respond to all users, the users in a particular area served at "the last mile" by a given wireless service provider may at some time overwhelm that provider's capacity at that location ("maxxing out the cell site"). Therefore wireless Internet radio remains particularly vulnerable to occasional service outages due to scalability problems.

Economic issues

Beyond technical scalability concerns, there are often even tighter restrictions on access to Internet radio streams due to cost considerations. Because each user's request for a stream adds to the bandwidth bill of the streaming service, artificial caps are often placed on the number of simultaneous streams that can be served by the host, for purposes of cost containment. This stands in stark contrast to broadcasting, where service-delivery costs are fixed regardless of usage levels.

Given all of these obstacles, it should be obvious that Internet radio can never provide a true and complete replacement for broadcast radio. Conversely, broadcast radio will never provide all of the features or geographic reach that Internet radio can provide.

Public broadcasters shouldn't really want such replacement, anyway. Enhancement and expansion of service have long been a goal of the industry, so "on-air *plus* online" seems an appropriate mantra going forward. The challenge then becomes deciding what content works best on which service.

Measurement

One other key difference between broadcast and online radio is the enumeration of listeners. Broadcasting necessarily uses statistical processes to estimate audience size, whereas online usage can be measured directly, thanks to its two-way connectivity. This difference can also be leveraged to a broadcaster's advantage.

AT&T's new wireless data rate structure

A potentially critical new market variable has entered the picture, with the recent AT&T Wireless announcement that new customers will no longer be offered unlimited flat-rate data service.

Although early analysis of the specifics of the new AT&T rate structure shows that most Internet radio users would still fall within the flat-rate zone, the move by AT&T crosses a virtual Rubicon. It is now conceivable that the current rate structure is simply the first step in a gradual throttling down of flat-rate service thresholds, and that if one provider has done so, others may follow.[8] This movement could affect the uptake of wireless Internet radio by future consumers.

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[8] Witness the still increasing "foreign" ATM charges that nearly all banks now levy after years of offering such service for free. During those years, strong consumer usage patterns were established, and once such behavior was created, the institution of small but incrementally growing fees for continued usage was grudgingly but broadly accepted by consumers.

Broadcast and Internet Radio: Looking Ahead

1) Growth of online radio listening will continue, but at a moderate pace. Some but not all of this will come at the expense of broadcast radio. A relatively slow transition is now in evidence among nearly all demographic groups, and within all radio listening venues (home, work, car, and personal devices).

2) This gradual cross-fade will continue between broadcast and online radio listening, but the transition will never be complete. A permanent baseline of broadcast listenership will remain, regardless of the ultimate growth of Internet radio. It is unlikely that a typical station will ever see its online listening audience greatly exceed its broadcast cume (or afford the bandwidth costs, if it did), although a broadcaster's online TSL may surpass that of its over-the-air services (the latter has already been observed).

3) An increasing number of new devices – fixed, mobile and handheld – will include both broadcast and online radio listening capabilities, but some will remain limited to one or the other. Many legacy devices that also allow either one method or the other will also remain in use for some time to come. In this "mixed" environment, listeners will take up a "best available device" approach to seeking out the content (not the channel) they desire in their current situation. Podcasts of broadcast content also play an increasingly important secondary role here.

4) Broadcasters should respond to these trends not by trying to choose any single delivery approach (i.e., trading transmitters for servers), but by using an "all of the above" platform methodology, with minimal duplication of content and careful programming of each service appropriate to the usage behaviors observed for the respective delivery methods.

5) Rather than being preoccupied by the question of Internet vs. Broadcast service, the key process that broadcasters should consider today for planning and future investment is the development of compelling visual content to enhance their radio services, along with examination of the currently emerging methods proposed for synchronous delivery of such content to enabled devices.

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