

HD Radio: a cost effective approach to producing enhanced radio programming for a digital audience

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ABSTRACT

The advent of HD Radio is a challenge for radio programmers and production teams. Not only does HD open the way for program associated data such as main program service and station information services, it creates a new channel for distributing advanced application services which include multimedia functionalities. Scheduling play-lists and broadcasting programs for such an enhanced radio network require that production teams implement new types of digital content production workflows. This paper details these production challenges and offers possible solutions based on case studies of radio broadcasters that have been faced with similar issues for other digital radio broadcasting platforms.

CONTEXT ALONGSIDE CONTENT

Digital Radio has a chance to break one of the biggest drawbacks of modern broadcasting. We spend millions of dollars making compelling news and entertainment; then it is all hidden behind one of the world's worst user interfaces: the frequency dial on the radio! The frequency says nothing about what's on now, what's about to come, and, just like phone numbers, dial positions are almost impossible to remember in a multi-channel world.

By contrast, HD Radio™ – the digital AM/FM technology developed by iBiquity Digital Corporation, offers broadcasters the chance to take advantage of the **Station Information Service**. This data service provides the station's ID along with technical information such as time, call letters, etc. In addition, **Program Associated Data** (also known as **Main Program Service Data**) can be dynamically updated on the receiver screen to inform the listener of what's on air now.

This Program Associated Data (PAD) is like an active signpost. For instance, when tuning in to a music program, digital listeners can read the title of the song being played and the name of the artist on the receiver display. The HD Radio specification even allows for radio stations to broadcast the name of the album, indicate the genre and provide a comment together with product availability information.

In a later phase, **Advanced Application Services** will go one step further¹. They will use the HD Radio system as a platform for distributing multimedia content such as interactive ads and audio on-demand services.

These different associated data services are not an extra, a sort of “nice to have” if you have the budget. They are essential if radio stations want to stand out in a crowded market place. Providing a relevant station information service is straightforward. It is static information that does not change with programming. On setting up the HD Radio exciter, a station's engineering department specifies the station's unique ID, and inputs call letters, alias and description. That is all there is to it. Program associated data on the contrary represents much more of a challenge for the production chain. This is less of a technical issue than one of change management. Modern digital radio broadcast systems now have the ability to broadcast PAD along with music programming. The problem is that production teams need to dramatically change their workflows so as to make sure that they not only provide relevant information to listeners but also offer original, competitive services. As such, these services represent a unique opportunity for new marketing concepts, many of which are already tried and operational on other digital platforms in Europe, Asia and the US.

IMPLEMENT A DIGITAL MEDIA LIBRARY

Content libraries are no longer static, relegated to the end of the production chain just to store things. They are now used at every stage of the broadcast. In fact, they are the key to efficient HD Radio production.

By offering broadcasters a way to label audio content as it is transmitted, HD Radio makes synchronized data part of the core broadcast business. In marketing terms, providing relevant, live information enhances the basic service a station offers its listeners. To achieve this, digital radio content providers need to incorporate data

¹ Refer to www.ibiquity.com/technology/data.htm for further information.

handling capability into their production and broadcast systems.

Media management becomes the key. The issue is that few, if any stations, can afford to add this requirement on top of their existing investment in news and/or music production. To tackle the challenge, it makes sense to step back and examine the least efficient areas of the program production chain.

Eliminate Post Broadcast Hassle

All broadcasters are required to log details of music and commercials played, either for copyright owners and/or commercial clients. Traditionally, this data is assembled *after* broadcast on the basis of logs. In some stations there is some degree of automation, but it remains a battle to get the details on time and often the logging details are inaccurate or incomplete. Program makers are busy with today and tomorrow. Very few care about what they broadcast yesterday. Journalists, especially, are loathe to fill in extra fields on a computer screen when they are already expected to meet tight editorial deadlines. So, if music and contributor details are filled in *after* broadcast, the information is expensive to compile.

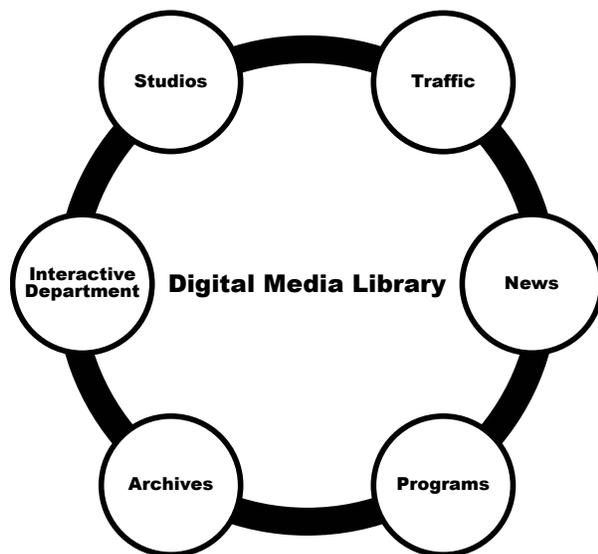


Figure 1 – A digital media library provides a central repository for all tracks and program associated data to be broadcast.

Grab Music Associated Data Upfront

The solution is to ingest all the metadata (*i.e.*, information about song title, artist, performer, publisher and other copyright details much earlier in the production chain. A **digital media library** that holds songs, soundbites and cue material, along with the corresponding metadata, needs to become the backbone of all production and broadcast operations (see Figure 1). This requires that when songs are transferred from CDs to hard-drives, the corresponding metadata be input at that point in the production chain. This process

can be greatly automated using dedicated software often referred to as “*CD Rippers*”. These transfer CD tracks to a hard-drive much faster than real time. They automatically search for the corresponding album and track information from existing on-line databases, such as CDDB from GraceNote². Editorial and operator intervention is still required though, so as to complement industry-standard information with a station’s music attributes. But such textual information is often already available in the existing music scheduling system.

Today, cheaper storage costs makes it financially attractive to keep music tracks permanently on-line, along with its associated data. In January 2000, one US dollar bought 65 MB of hard-drive storage; in March 2003, a dollar paid for 780 MB or twelve times more capacity. This year, storing on-line 100,000 songs or 20,000 hours of broadcast quality content, *i.e.*, MPEG-1 Layer 2 format, can cost as little as US\$10,000 (for 3.4 TeraBytes)³!

Such an on-line digital media library provides program directors and dee-jays with incredible scheduling flexibility. Any song is just a click away. More importantly, drag and dropping a selected track into a playout stack not only cues the music, but also guarantees that the metadata is ready for synchronized transmission. The side effect is that the same metadata can be used to log broadcast songs to automatically generate accurate broadcast reports required by copyright institutions. The metadata can also be used to provide new types of services. In Canada, the Zoopad company is building digital radios to store the PAD and couple the program associated data to a CD shop on the web. Listeners press a “squish” button on the radio to order the MP3 file of the song they just heard on the radio.

REENGINEER PRODUCTION TO COLLECT PAD AT EACH STEP OF THE WORKFLOW

Automating the generation of music-associated data may be possible, but this is not the case for labelling feature programs. Production workflows need to be reconsidered to ensure that program associated data is built up gradually. Making feature producers aware of the importance of PAD is all the more important now that their content has a “*shelf life*” longer than the transmission date. One possible element of persuasion is the gathering of copyright information in view of multi-platform distribution.

² www.gracenote.com

³ Source: Apple website on January 17, 2004.

A growing trend in Europe is to commission feature programs for “public distribution” over a given period of time. This means the program is broadcast in specific pre-announced slots. But it is also available as an audio-on-demand service on the web for listening at a time convenient to listeners. Danish Public Radio uses the metadata attached to a program in its digital content catalogue in two ways: first to generate the “on-air now” data to be broadcast alongside the digital audio; then, to create dynamic webpages where listeners can search for programs they want to hear, either again or because they missed it when broadcast. Danish Radio started such a service in mid-2003 and reports more than 100,000 audio downloads a month. This shows a significant public demand, bearing in mind Denmark has a population of just 5.3 million.



Figure 2 – By collecting metadata at all steps of the workflow, production staff can ensure that PAD is relevant.

TAKE ADVANTAGE OF TEMPLATE BASED PRODUCTION TOOLS

Synchronised labelling of news and talk shows on digital radio is a much greater challenge. The written forms of most languages is different from good prose for radio. Broadcasting the script of a newscast being presented on air as PAD is not attractive. Though stream-of-consciousness talk radio is designed to be listened to and not read, experiments in the UK with “Vision Radio” have shown listeners’ interest for relevant news and sport headlines when displayed on suitable digital receivers. Contextual information such

as the list of participants in a talk show prove to be attractive program associated data.

Producing rich media content with consistency requires adequate tools for editorial and programming staff. Radio Netherlands, a public service broadcaster producing NPR style programming, faced a similar challenge. It sought a solution to allow its editorial staff to feed simultaneously a variety of different rich media platforms:

- News bulletins for the web;
- A “news ticker” service for pagers and partner websites;
- News briefings for hand-held Personal Digital Assistants (PDA);
- E-mail newsletters;
- Inputs for radio bulletin editors at affiliates.

To successfully implement such a cross media strategy, Radio Netherlands defined a clear framework for news production in advance. It implemented a single content management platform to span across the different production units, from the newsroom to the interactive department. So as to make sure that the production staff would not get irritated by seeing their jobs become a never ending series of form-filling, it gave ample space within the structure for journalists to create a story. A series of template designs, allowing variety in layout depending on the length of the story and the availability of photo material was created.

Wherever possible, metadata is generated automatically. Date, author, sub-editor, reading length, are all filled in by the system. Journalists are encouraged to focus on meaningful headlines, since these will appear on pagers and hand-held PDAs. Spell-checkers warn radio journalists that their copy will be seen as well as heard. If an editor commissions a story, pull down pick lists suggest the standard fee. So as the story progresses from idea to transmission, the people making the decisions are adding relevant metadata.

Not all metadata is published externally. Some details, such as the negotiated payment now due to a contributor, are available to the administration department as well as to managers keeping an eye on production budgets. In short, metadata is generated at the point where editorial decisions are made.

DRIVE INTERACTION TO GENERATE REVENUE STREAMS

Such a reengineering of editorial workflows can generate cost savings. Return on investment nonetheless can be accelerated by generating new revenue streams. One increasing source of income for broadcasters in Europe and Asia in the past few years has been the premium charged short messaging service

(SMS) provided by mobile phone telcoms. Revenues now generated from SMS mobile services are far beyond the predictions by the research bureaus. Around 700 million SMS messages are sent around the world each day. Global revenue estimates for 2003 vary around US\$ 50 billion per year, with steady growth predicted until 2006/2007. Program associated data allows radio stations to exploit this phenomena in several ways.

Voting

The simplest revenue stream is voting. Radio hosts broadcast an opinion piece or put talent in a showcase. Listeners are encouraged to vote for their favorite by SMS-ing to a simple premium rate number. Program associated data on the receiver screen reminds the listener which number to call and shows the results of the poll in real time. Younger listeners, especially, seem to be all the more attracted when the outcome of the show is not yet determined. Their vote might change the fortunes of their favourite. But there is a deadline to participate. And for the privilege of influencing the outcome, they are willing to vote for nearly a dollar per vote and/or subscribe to a mobile newsletter with behind the scenes gossip on their chosen star.

Digital radio listeners can be offered exclusive deals through PAD, such as concert tickets or back-stage passes, by SMS-ing or calling premium numbers only shown on receiver screens. This kind of revenue generation requires a minimum of extra production.

E-Coupons Via Radio

A second simple revenue stream is adding electronic coupons while ads are being broadcast. Like the US, the coupon culture in Europe is changing. Coupons appeared during World War Two, when scarce goods could only be bought on the production of a relevant coupon. The 1960s saw this evolve into coupons that brought discounts. However, Generation X and younger is not in the business of cutting up magazines and newspapers. Despite increased coupon face value, coupon redemption has been declining for years. In Europe, the average 20 year old reads a newspaper for less than a minute a week! And so wireless coupons are being experimented with.

During a radio commercial advertising a new movie for example, the HD Radio data channel broadcasts the link to a special website. Visitors to the site download a coupon to be printed at home and exchanged at the movie theatre. Instead of a URL, a toll free (or even a premium rate) number can also be displayed. Listeners can SMS it to obtain a coupon sent directly to their mobile. In Holland and Belgium, trials are going on with software that produces a barcode on the screen of a mobile phone. Scanners at the movie theater read the

code and print tickets. The scheme offers no waiting and preferential seating.



Figure 3 – Until HD Radio advanced application services are available, mobile phones provide a profitable alternative.

EXPORT ENHANCED RADIO PROGRAMMING TO OTHER MEDIA PLATFORMS

HD Radio Advanced Application Services (AAS) will greatly facilitate the implementation of such marketing schemes in the future. Until AAS is possible though, broadcasters can explore possible synergies with other media channels. Radio channels exported to other platforms are starting to produce measurable results. In the UK, for instance, PCs and television sets are proving more popular. Whereas 3.6% of the population (1.8 million) listen to radio channels on the web each week, 12.5% of the population (6 million) per week listen to radio on their television via digital terrestrial services. TV turns out to be the first, widely available digital Radio receiver!

TV sets make great HD Radio receivers

In Europe, there are periods of the day when one of the national TV channels used to carry programme information, the current time plus a text summary of news. These data were not co-ordinated with the audio which was the output of a national radio station. Now, for approximately 18 hours a day, the screen carries the same synchronized text as is broadcast on digital radio, explaining the current topic of discussion. Viewers to the TV channel (and those with a digital radio) are invited to chat with the participants in the studio. The SMS chat lines are displayed on TV. They provide both feedback to the studio and peer-to-peer contact. What is more – SMS generates revenue. Those who want to use their mobile phone to participate in the chat are required to use a premium rate number. The result has been, on average, 5,500 SMS messages a day and a revenue of around US\$ 900,000 a year to the network.

An “interactive” producer is needed to ensure an active dialogue between the SMS-ers and the radio studio.

This is essential to ensure that the SMS-ers feel involved in the debate and that a selection of the more considered reactions are used in the radio program. The producer can also filter out those who use obscenities and blacklist those users who try to abuse their national exposure on TV. But because of the premium rate charge, abuse callers are discouraged from wasting their time and money. The income more than offsets the cost of production.

Similar success has been met with live sports events where, for copyright reasons, pictures from a football match cannot be broadcast, although a radio commentary is on the air. The radio department produces an active webpage and TV-page showing the latest scores, relevant statistics on the players, SMS chat as well as knowledge quizzes. This appeals especially to the 20-40 year old age group, who are often listening to audio through the TV.

Digital billboard networks are down the road

Joint ventures between broadcasters and datacasters are also reaching larger screens. Sophisticated multimedia digital signage is popping up everywhere:

- In retail establishments such as Wal-Mart, with info on special offers;
- At virtually every concert, trade show, sporting match, or other public event you attend;
- In government offices – such as the U.S. Post Office, which is deploying one of the largest digital signage networks in the United States;
- And in many other locations, ranging from railroad stations, airports, highways and corporate offices worldwide.

These digital billboard networks allow retailers, government agencies, marketing and entertainment companies to cost-effectively “narrowcast” dynamic photos, graphics and editorial content on hundreds or even thousands of digital signage displays located across wide areas. Sales of indoor and outdoor retail dynamic displays, just one part of the digital signage market, is already worth \$550 million, rising to \$1.5 billion by 2008, according to iSuppli/Stanford Resources, a California-based market research firm.

The arrival of such dynamic signage networks can be accelerated through the use of digital broadcasting networks. Many players are realizing that the best infrastructure for mass distribution of content remains broadcast. Internet based distribution is proving too expensive for media-rich content. Broadcasting requires investment for the first listener, but additional listeners across a wide area cost nothing extra. In both the mobile phone and webcasting models, the producer pays for the bandwidth, with each new consumer requiring the producer to pay. For large-scale content delivery networks, bandwidth requirements are such

that taking advantage of a broadcast infrastructure proves much more cost efficient.

As advanced application services become feasible, HD Radio could play a key role. Radio stations are ideally equipped to develop data services which are not directly linked to their programming. Their signals cover wide areas, reaching places where mobile phones are banned, either for security reasons, or because of electromagnetic compatibility issues, such as in hospitals. What is more, the HD Radio system specification allows multiple data services to share the broadcast capacity of a single station.

Such a model is already being experimented with in Asia. Just over four years old, SmartRadio from MediaCorp Radio in Singapore, is already an established player of the Asian scene, with six digital-only radio networks. It is interesting to look at the experiments being conducted with the 20 PAD/Data channels. Across the island of Singapore, e-billboards receive and display the latest news headlines, entertainment gossip, airport departures and topical advertising. The ability for advertisers to “comment” on news developments allows for some very creative campaigns. The system is also linked to the national defense system, so in times of emergency (such as severe weather warnings), screens warn people in public places. This is the modern equivalent of the Emergency Broadcast System available in the US.



Figure 5 – In Singapore, SmartRadio from MediaCorp Radio is exploring possible synergies between digital radio and electronic billboards, large and small.

Singapore has also been experimenting with special narrowcast services. Continuous music services to shops, fitness centers and fast food chains is a simple example. But trials are also going on with a system called Mr Taxi. The PAD/Data channel is used to provide entertainment to moving vehicles. As well as music, the system provides news updates, special offers

on night spots to screens in the passenger seat. It takes advantage of the fact that digital radio offers the possibility to add photos and simple flash animations to the datastream, being displayed on suitable receivers. Better still, a datachannel of 64 Kbps turns out to be sufficient for distributing video clips to small screen devices.

Work, rest and PDA

In Europe and South East Asia, program, sales and marketing departments in commercial radio stations are developing new types of datastreams. Traffic information and audience participation are taking on new forms.

GPS navigation systems are already in many rental cars. Radio stations in Europe and Japan broadcast travel updates to the navigation systems, often displaying delays or roadworks on an visual display in the dashboard. Companies like Tom Tom are looking at similar GPS/digital radio combinations for intelligent hand-held maps. Think of mountain climbers or yacht owners who might benefit from advanced weather warnings on such hand-held devices.

In South Korea, integration of technology from digital radio and mobile phones are leading to some interesting possibilities to stream video clips onto hybrid digital “*radiophones*”. Bearing in mind that in Europe and Asia, 20% of the installed base of mobile phones now have a camera, the appeal of visuals to younger consumers should not be underestimated. Everyone likes hearing their dedication on the radio; in the near future such dedications could take the form of a photo or animation to a mobile radio device.

CONCLUSION

HD radio offers broadcasters new paths to increase market share as well as consolidate production costs. Real benefits appear when station owners examine how they currently produce programs and look for ways to integrate new services into the workflow. Program associated data and electronic program guides are not an afterthought. Once properly implemented, the flexibility of HD Radio will stimulate early development of Advanced Application Services, empowering broadcasters to explore cross-media opportunities and move beyond their traditional “radio” model. Such a move requires adapted production tools but, just as important, it means aggressive business development and creative marketing.

Digital technology arriving shortly will put radio receivers into a lot more devices than traditional “radio sets”. This will also increase the time consumers spend with radio and that is important to any station owner,

commercial or non commercial. This increased market share will only come to radio networks which exploit their HD Radio data capabilities in strategic and creative ways.

Audiences are already demanding new ways of finding content. With one major US retailer reporting sales of analogue radios down by 6% in 2003, the migration to alternative platforms for audio has started.

FURTHER INFORMATION

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