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Paper No. 10
Rafael Oei  
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MY RADIO: EVOLVING TO SURVIVE  

AMIC 9TH ANNUAL CONFERENCE  
THE DIGITAL MILLENNIUM: OPPORTUNITIES FOR ASIAN MEDIA  
June 29 – July 1, 2000, Singapore
MyRadio: Evolving to survive?

Acknowledgements

My heartfelt gratitude goes to the Director, Dr Victor Valbuena, and Deputy Director, Paul Bisnette, of the Centre for Film & Media Studies at Ngee Ann Polytechnic. They have been very encouraging and supportive of my endeavours and management of the radio section in the Mass Communication Diploma programme at the centre. Our concern is to provide a relevant programme for the proper development of future media professionals in the region. Over the last few years, I've been exploring the implications of digital radio and how this would affect radio in the future as this is the environment in which our students would be graduating into. I appreciate the trust that I feel I have been given by my bosses.

Thanks also to the members in the various Singapore DAB committees. They have been patient with each query and in providing information that have been very useful for both the classroom and personal research. To all my friends at the various radio stations around the world who have also been patient with my queries and mental explorations of the state of radio in our time; I appreciate it.

To the faculty at the media and communications department of the University of South Australia for your support and the guiding framework for my arguments even though I am still rough around the edges. Thank you.
Abstract

This paper proposes that the personnel and organisational structure of the radio station may have to undergo a paradigm shift and structural modification in order to deliver relevant radio content and services in a world where information has become more dynamically accessible through wireless telecommunications and the Internet. This evolution is inevitable if radio is to remain vibrant, relevant and survive in this millennium. In order to compete in this enhanced communications platform, radio will have to utilise and adapt into systems like the Eureka 147 used in digital audio broadcasting. I believe that a structural change may be necessary to optimise and realise the potential of new digital broadcasting technology. I will propose communication structures, organisational configurations and modes of operations as possible organisation-system solutions to enable the daily delivery of dynamic radio content and services in the digital domain.
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Introduction

I begin by stating that I am by no means claiming to have the answers. This is because I feel that it is imperative that radio broadcasters admit to the inevitable influence that technology will dictate on the next incarnation of broadcasting. “Next?” you may say. I may be making a mountain out of a molehill. As Lew Dickey says in *The Franchise: Building Radio Brands*:

"... broadcasters continually overestimate the importance of radio in the everyday lives of their listeners. This is an easy trap to fall into when you consider the highly emotional nature of the business and the daily interaction with a highly involved segment of the customer base..." (Dickey 1994, p xiv)

David T. MacFarland shares the same sentiment in his book *Future Radio Programming Strategies*:

"The way radio industry people tend to divide up their world (management, sales, engineering, programming, etc.) does not occur to the listener in the least. Listeners do not even care about programming - ..." (MacFarland 1997, p 10)

However, listeners are now exposed to digital technology even more, on their personal computers, mobile telephones, in their cars, the movies, the music they listen to and basically almost everything in their environment. Information and entertainment are also now “on-demand” and easily available. I share in Dean Sakai’s view as stated in his preface to *The Targeted Audience*:

"With so much change occurring in the communications industry, it is more important than ever for you to ask yourself how service can be increased to customers. How can you find out what information viewers and listeners prefer and the ways they want it supplied to them?" (Sakai 1999, p xiii)

Radio broadcasting, after all is a service rather than a product to be consumed. We talk about the target audience and their demographic profile along with their psychographic make up. We argue about cornering the market, building a format and discuss rotation numbers. I submit that with available and soon to be available digital broadcast technology, personal service and a tighter structured format to cater to the listeners needs would be possible and with even more focus. I will discuss this further in the coming sections.
MyRadio: Evolving to survive?

The catalysts of change have been the World Wide Web and all its trappings. In its present form, it has been around for basically less than a decade. Its phenomenal exponential rise was unexpected. Is it a success? Along the same lines, now the word is that everyone should “dot.com” if one were to survive and succeed in the new millennium. To date, no one can claim total success in either of these. Oh yes, of course people are getting rich from it: the Yahoos of the world, Dell, Sun Systems, Microsoft, Prince Alwaleed bin Talal (Serwer, Fortune 1999, p38).

The Internet is a concept that we are buying into, an intangible that we trade on in the stock exchange. There is no real estate or physical product that is being transacted. We are familiar with all the promises of an e-future where information, commerce, education, entertainment and communications will be readily available on some form of interface that will be able to process data from a wide variety of sources. Convenient and accessible 24-hours a day for 365-days in a year. No one is fully certain that there is any direct social and communal benefit to living out our daily lives transacting electronically. On-line courses and education are the next rave – learning anywhere at anytime. Convenient, self-motivated and flexible certainly. Will there be social and behavioural side effects?

A telecommunications advertisement towards the end of the last millennium foretold that pocket phones would enable the consumer to surf the Web at lightning speeds and that photographs would be sent as email attachments via the same phone. The dawn of the International Telecommunications Union’s IMT 2000 promises a universal standard to link mobile phones with the network through an “air interface” to enable subscribers access to lines anywhere in the world. There is talk of an upgrade of CDMA that would enable data speeds of up to two megabytes a second. Wideband cdmaOne promises even higher speeds with a higher voice quality and multimedia capabilities.

In the market now are mobile phones that can receive and send email messages and faxes. Trading on the stock exchange is also possible via the mobile phone and subscribers can also listen to the radio through that same mobile phone; not to mention the downloading and storage of MP3 music files on Samsung’s latest MP3 phone. The subscriber can then play it back and listen to it on a set of stereo earpieces. (Fortune No. 22: 1999, p 16, 17)

The implications that these features bring and its effect on broadcasting largely depend on the speed of consumer take-up. Yes, the technology and subscribing onto these services are relatively expensive at the moment. Once it becomes established and a regular means of
transacting and communicating, services may either be more affordable or be provided free altogether. Some of these services are already available in a limited capacity often through conditional access to information. We are in an era where the consumer is able to personalise the way information and entertainment are accessed and retrieved – this is the era of "my music", "my data" and "my-Internet site" with information and entertainment on demand. Does this mean that niche marketing is dead? Certainly it will mean more focus and concentrated packaging of services for the content providers.

The eventual question, if it is not already being asked, is why would I want to listen to the radio for the news or financial update if I have access to live-updates through my mobile phone? On that same phone I can listen to my favourite music and receive traffic and weather updates as well. All this on a telecommunication device that will enable me to call my relative in another country while I communicate via Internet and email on-line with services like Amazon.com or AsiaOne's auction-site that provide me with on-line shopping.

The answer may be listeners will tune in for the live on-air personality, the intimacy of the "one-on-one" chat with that personality and generally for the warm human interaction, if you can call it that. On the other hand, on-line chat rooms and email have certainly bridged the gap between the radio "DJ" and the listener. It is now possible to have instant access to the presenter, "live", while he or she is on-air. Imagine the excitement if just as you are writing out a message on your personal computer, the Presenter you are listening to responds to you live on-air as you type. Technology will certainly bring a whole new perspective to the concepts of interactivity, immediacy and personal radio.

To my mind, and in my discussions with industry professionals and members of the World DAB Forum during their last conference, I am unaware of any other exploration into reorganising the radio station as a means to forge ahead in the digital realm. The obvious explanation may be the cost that will be involved in restructuring and re-strategising exercises. In recent years, there have been calls to have paradigm shifts in organisational management and leadership philosophies. To consider yet another modification in organisational structure for radio is something that is less than palatable to most as it brings with it the foreboding of lost jobs. Already in Singapore, radio has had to undergo at least six restructuring exercises since 1989.

Even though digital radio has had its launch in Singapore, the current practice is to transfer regular FM/AM programming wholesale onto digital systems with the token programme
associated data (PAD) that is really only a slide show running on a carousel. There is still some confusion as to how to proceed while keeping faithful to the fine art of radio broadcasting.

Current local marketing efforts to promote digital radio just highlight the fact that the transmitted audio is now “CD quality”. Obviously, this in no way optimises the available technology. Given the option, listeners may rather listen to their own CDs or music on their portable MP3 players than purchase an expensive new digital radio just because of the audio quality. In fact, lately many of my students have become proud owners of portable MP3 players. And they have said that they would rather listen to that than tune in to listen to the radio. This was because music is now easily accessed through the Internet, selecting and downloading their favourite artistes and music from a menu through a click of a mouse-button.

True that it would be unrealistic to pander to each change in technology. In this case, I believe that to be able to effectively function to provide the services that digital broadcasting technology allows it may be necessary to further tighten the focus of each radio station and review the roles within each.

I think that old programming models, though tried and tested, will have to evolve to deliver content and information services in a more dynamic way. This implies a modification in radio content preparation that will in turn have an impact on the existing structure of the radio station.

The business of radio must seriously consider its modus operandi and programming ethic in light of what telecommunications is increasingly being able to provide the consumer.

There are some quarters that resist the migration onto a digital platform. Some argue that with inclusion of visual services through an optional monitor and by datacasting, radio is betrayed and that this is not “radio broadcasting”. The paradox here is that this digital technology permits radio to be more personalised, if not personal. This is through the possibility for the listener to programme and tailor each listening experience and access to information; whether it is to listen to the news, the financial report, traffic updates, a documentary or a feature.

I will explore some possibilities in the programming structure that may develop to perhaps serve as a catalyst for further discussion and exploration by the stakeholders and professionals concerned. Hamish McRae, in his article, 20/20 Vision, The New Mass Market suggests that the big idea of the 21st century would have to be “something that will do for services what Ford did for manufacturing.” (McRae 1999, p 48) This is because “services are so varied and so personal, it has been tough to satisfy both buyers and sellers.” (Ibid.) I agree with McRae as he says in this
same article that although the technology at the moment is crude and a lot of the promises may not be delivered now, we must look toward the changes that are coming through the potential that existing technology will bring. I believe that for radio, there is a real need to evolve or be left behind.

The pathway?

Very often, we may have to take a few steps back to move forward. With the benefit of hindsight, sometimes the path ahead looks clearer. Looking at the journey of the Singapore Broadcasting Corporation from 1980 to 1994 with the establishment of Radio Corporation of Singapore and a "friendlier" radio programming structure to deliver "Format Radio", we see tremendous change with levels of staff and departments restructured, people re-deployed and early retirements. Will a similar upheaval be necessary for the migration onto a digital platform?

For what seems to me to be the next logical step, I am not suggesting a radical turn around for radio. Unfortunately, there is no prior model for digital radio to follow after and learn from. We are a pioneering community in this new world of digital radio, constructing the environment and creating the rules and standards as we go along. For all intents and purposes with the present structure, a more focused definition of roles may suffice.

In some ways, the threats may lie in the looming developments in telecommunication and wireless communication services. Not to say that they are our direct competitors as they serve different needs and have a different purpose. The convergence of technologies, however, distorts and blurs the distinction between the roles of telecommunications and broadcasting.

Granted the words "telecommunications" and "broadcasting" already imply that difference by virtue of the mode of transmission and reception. To the listener, these may not be as evident especially when most listeners associate radio with good music and information. As I have mentioned at the beginning of this paper that now not only can listeners receive radio transmissions over their mobile phones, they can receive immediate news updates direct from the news services along with weather information and the lottery results.

To meet these challenges, radio has digital audio broadcasting technology available to it, offering broadband broadcasting of services that are superior to many of the present telecommunication offerings today. I am not proposing that Eureka 147 is the way to go. It may be any digital
broadcasting format. I am using the Eureka 147 model because this has been implemented in Singapore. The point is radio has to begin to seriously look into and consider ways to programme for broadband high-speed multimedia transmission.

With each stage of evolution, there is the normal spill over from past formats. An example was when television came along in 1948. We see radio orchestras performing on television, and television dramas written by radio playwrights with phrases that stated the obvious like "look he's got a gun!"

With digital broadcasting now, we find programmers offering exactly the same programmes from their FM services and transmitting them over the digital broadband. This is like using a Ferrari to transport old furniture.

Without getting too technical, I will briefly go through the features offered by Eureka 147 technology, also known as digital audio broadcasting (DAB) technology.

Obviously, digital radio transmits using binary digits or bits. It offers interference free, CD quality sound at 96 dB. For broadcasters, there is high spectrum efficiency and a power saving transmitter that allows for enhanced programmes with text and graphics through an optional monitor attachment.

Each frame has this configuration for the MPEG-1 Layer II Bitstream that is used in DAB:

<table>
<thead>
<tr>
<th>Header</th>
<th>Bit Allocation</th>
<th>Coding of 3 sets of scalefactors</th>
<th>Subband Audio Samples</th>
<th>PAD</th>
<th>Scalefactor CRC</th>
</tr>
</thead>
</table>

Figure 1 Frame of MPEG-1 Layer II Bitstream

The frame allows Programme Associated Data (PAD) along with the transmitted audio programming. Non-Programme Associated Data-casting (NPAD) is streamed along a separate route independent of the MPEG frame.

PAD may include the song titles, lyrics, display the album cover, photograph of the artistes and even links to more information in perhaps websites.
NPAD may include weather information, traffic information, radiotext, paging services, e-newspapers, access to personal email accounts, stock market quotes, perhaps surf the Internet and even e-shopping.

A possible future for digital radio receivers may include the ability to programme listening and programming choices. Perhaps the listener may want to listen to one particular artiste all day. The digital radio receiver may be programmed to scan all the radio stations just for this artiste and play it back for the listener. Perhaps the listener may want to listen to the news at the fifteen-minute mark because that is when there is time for a break from work. This may simply be done as well. Effectively, digital radio will enable the listener to alter the listening experience to suit a personal preference or time-schedule for each day tailoring radio programming to suit personal habits.

Pegged onto each programming item, in both the PAD and NPAD, broadcasters may attach a cost to that "space". So when a song or programme is transmitted, the attached space may hold a commercial that will be displayed on the monitor. A link to an on-line purchasing service may be added so that the listener may buy the album or single, or even download an MP3 version of the song while the song is being played. This implies that commercial airtime is now item or programme specific, and no longer a linear phenomena within a time-belt or an hour clock in a broadcast day. It only stands to reason that if the listener of the future has the ability to select and programme the listening choices, then commercial airtime must similarly be dynamically attached to each song, programme or broadcast item. Linearly programmed commercial airtime will then be ineffective. The implications of this would be more opportunities to sell "air" or programme space. In fact, vendors or retailers may even attach an option to print out a discount coupon for use at their outlet, and with the Global Positioning System (GPS) on a DAB receiver, show the listener the best route to their store.
Figure 2 Possible supporting graphic and links for the DAB monitor

Programme Associated Data (PAD)

Supporting graphics, commercials or visuals on a monitor

Audio programme/song with audio-linked advertising

Audio programme/song with audio-linked advertising

Digital Radio Receiver

Weather, traffic information and graphic on the DAB monitor

Weather, traffic information and graphic on the DAB monitor

News and info updates from various information services

News and info updates from various information services

Adverts, access to Websites, and/or Market Information

Adverts, access to Websites, and/or Market Information

Possible paging service or access to the email with synthesized voice readout for cars

Possible paging service or access to the email with synthesized voice readout for cars

Programme Information

Picture of the artiste

Picture of the artiste

Lyrics of the song

Lyrics of the song

Link to on-line shopping to purchase the album

Link to on-line shopping to purchase the album

Link to the website

Link to the website

Link to the station website, email or chatroom

Link to the station website, email or chatroom

Conditional access to other services

Conditional access to other services

Non Programme Associated Data (NPAD)
To the consumer, transport modes are immaterial. They are more concerned about services that are available to them in digital radio.

Having said that, the initial menu displayed to the consumer would reflect all the services pertinent to the intended consumer. This may be customised by the consumer through an interface within the services provided by the multiplex operator. Once configured, the desired configuration may be saved and recalled whenever the consumer switches on the digital radio receiver.

Conversely, consumers or subscribers of digital radio services may access a website. Here they may select how they will receive digital radio services through any given receiver they may own. Data and information will be configured specifically to their tastes, making that digital radio experience unique and personal to them. The added advantage of the website would be the ease in disseminating information and hardware updates as well as providing an avenue for feedback and to administer surveys.

Limited information will be displayed through the Dynamic Label Segment on receivers without monitors. Here, only key information will be configured for DLS transmission, leading the consumer to possibly want to access the full interface when access to perhaps a PC with the appropriate PCI card is available either at home or at the office.

**Menu selection:**

These could consist of the top three news or information items that will be reflected at first refresh. More information and details may be accessed upon entering the website or archived page of that particular service. The format for this may be HTML or a screen captured in GIF format to be displayed as PAD or NPAD.

The initial page for the Weather and traffic information service will have the latest information displayed upon refresh of the “Traffic/Weather” menu screen. This could be on a carousel that updates itself. For traffic updates, there could also be a choice of sky-cam view or road map view that is selected by the user. Alternatively, the views could also be pre-programmed. A selection of key screen files may be scheduled to run sequentially to achieve this. Each screen may be automatically updated and saved in these same key screen files. In the same way, this would be one way to create the illusion of providing a clock or temperature/weather reading service on each screen. The illusion of “movement” as the information is updated is created with each screen.
Dynamic links and access to more information, video streams, animated data and graphics will be characteristic features in digital radio services. Providing more choices in data, news and information as well as access to audio services from service providers would be strengths of digital radio. This flexibility will also enable digital radio to remain a companion to the consumer and reinforce radio's relevance in its latest multimedia form.

Given the dynamic nature of DAB, content programming and broadcasting may be in packets, streamed in traditional broadcasting mode, programmed in modules or recalled on demand. In the present system generation, these would characteristically be categorised under the NPAD services. The implications of this include the possibility of recording labels providing services directly to their consumers. This includes access to the latest releases in packet format that is decoded when selected by the consumer, streaming the audio for the consumer from their vast music database on demand. Conversely, these same recording labels may offer streamed audio through the audio service channels as a regular feature, providing more immediate and updated music and entertainment services than a conventional music radio station could ever dream to do.

Further to this, and working along the same argument, having the various services available within one service channel (frequency) also implies that content from each service should logically be unique. Services would have to be narrowly formatted and packaged. This means a more focused and narrow-casted service that satisfies particular niches or needs from each provider. So there is no need for the Traffic service to also carry musical interludes, or for the classical music station to stream ethnic folk songs along with its programming of chamber music for strings. Radio stations would now have no need to provide everything for their listeners in their daily broadcasts.

For instance, if Newsradio 93.8FM were offered alongside BBC, CNBC or CNN, the user/listener would no doubt select the international news services for international news, and Newsradio for news local to Singapore. Conversely, Newsradio may report international news from a Singapore perspective or as an editorial commentary. With such a vast array of choices, the listener/user would prefer an expanded perspective rather than the same news repackaged almost word for word from the wire services or any of the international news agencies and then transmitted alongside local news stories on a local news service.
The screens may be created from selected information and data captured from the service provider’s website and saved as a graphic file formatted for the Bosch Monitor.

Interactive multimedia services may be promoted through these portable screens to lead the consumer to use PC services and other static receivers.

All screens and services should be consistent and compatible with all receivers. Considerations would include saving most screens as graphic files to maintain visual consistency with interactivity reserved for PC receivers for the moment.

DLS advertising can be charged by the character, full screen adverts will be static graphic files and animated/video/audio advertising may be packed as NPAD in the ensemble service the advertiser has bought into.
Local offerings would include local news services, and a weather and traffic service. Weather/Traffic updates may be provided by a separate and dedicated 24-hour Weather and Traffic service that is carried on an individual channel.

In this case, Traffic and Weather information and data may come in the form of text and graphics that are automatically updated. This information could then be vocalised through a text-to-voice processor engine within the digital radio that may be activated whenever this service is called up. The same hardware may be used for a text-to-voice email service as well which is especially useful for accessing the email service in the car.

The model for digital radio would then be approached from the end of information and data, presenting the choice of listening modes to the consumer along with the data and services rather than from an audio-first approach. This expands the potential of digital radio and opens it up to an array of services that can be offered to the consumer.

I think these features, though not totally available now, will actually personalise the radio experience, bringing radio closer to the listener, making it more relevant and essential in the day's activities. The technology definitely has potential for versatility compared to the mobile phone or the palm-top. The point is to make it effective and to implement an organisational structure to effectively deliver this possibility.
MyRadio: Evolving to survive?

A new programming paradigm?

How could these services in radio be made possible? Two models are available - the cable-television network and the concept of ISPs or Internet Service Providers.

Along similar lines, this could also be viewed as taking Format Radio one step further narrowly focusing each format to provide specifically that content.

The reason why I am saying this in this context is in Singapore, currently, each radio station though formatted to a specific listener-group and genre also carrying content that may be shared or is a duplication of other radio stations. Certainly the stations project a certain image and provide certain programming for specific audiences. However, between these core-programmes are pseudo-fillers that may come in the form of songs, music or presenters filling in the space with public service announcements, the weather and so on. For instance, even in a CHR station, we will be able to get news and information that is not unlike the fare offered by News Radio 93.8FM. This may be due partly to the fact that there is a government regulation that stipulates the percentage of information content and music that has to be transmitted per broadcast day. On a digital platform, if radio listening can be tailored to individual listening preferences, then there is no way of knowing if the listener will be listening to you for any length of time and during what periods unless a “cookie” is sent or some research is carried out. So, perhaps, as true service providers, digital radio may offer services that only have content specific to their 'format' with transmission running constantly ad infinitum. This is not unlike Bloomberg radio that is currently broadcasting as a full DAB service in Singapore. With an enhanced digital broadcast format, regulations may also have to be reviewed based on the mode of delivery and the carrier.

So, according to this model, news radio will provide pure news and information around the clock not unlike cable CNN or the BBC. A rock station will provide pure rock programming, and adult contemporary stations will only broadcast selections that reflect that category. Perhaps, with such giants like CNN, Time, CNBC and the BBC, radio in Singapore may concentrate more on local news and specific radio formats. What may emerge is a division or radio station that runs a multiplexer having a configuration like this:
Transmission from MULTIPLEX A

<table>
<thead>
<tr>
<th>Rock Station</th>
<th>AC Station</th>
<th>Local News</th>
<th>CNN</th>
<th>CNBC</th>
<th>Classical Station</th>
<th>Others</th>
</tr>
</thead>
</table>

Figure 4 Possible DAB programming organisational structure
Taking into account the nature of programming for digital radio, there would be some modification in roles and responsibilities within the organisation. The structure shown above is similar to the general organisational structure of a radio station. The tasks of the multimedia director would be to co-ordinate with programming to maintain station integrity as it is perceived by the listeners. This is of course achieved through the daily broadcasts and the nature of its content.

Roll out for regular data and information services with or without audio streaming must be maintained in the programming team. This may be a dedicated team of content designers that are led by a programme director familiar with multimedia design would have to prepare, format and programme content to be delivered on digital radio. The team would constantly maintain and review dynamic menu interfaces and GUIs (Graphical User Interface).

Programming will also have to take into account the selection criteria for service providers. The most convenient would be the availability of ready-content for text and graphic display from these service providers that can be used effectively to accompany the intended service on digital radio.

Improvements in interactivity in digital radio will help improve these essential services. These include the integration or creation of backchannels that would enhance interactivity with technologies like GSM, 3G or other wireless services.

An organisational structure must be installed to manage the daily responsibilities and routine functions of digital radio services to facilitate the duties and functions implied above.

As with the traditional radio station organisational structure, the key responsibilities may be as follows:

a) A Programme/Station Director:
To define the vision and objectives of the digital radio service to be provided. The strategies, structure, format, nature of programming and work-system that will deliver the service based on the overall vision of the station will be a key responsibility of this person. The perception of the station and organisational culture will derive from the resultant ethic.
b) A Multimedia/Creative Director:
This person will work with and support the Programme Director in the development of the concept that will create the perception in the consumer of the intended service/product. As digital radio is more visual and interactive than its predecessor, it is imperative that the appropriate perception is created in the consumer in order to achieve and deliver the overall vision of the station.

c) A Music/Audio Director:
This person will work with the team to ensure that audio and music services, where necessary, are appropriate to the station and/or service provider based on the set vision. Duties would also include optimising and determining the aesthetic programming/scheduling of audio/music, including its compression formats where necessary. Unless the operator will provide music/audio service regularly as a service, the Music/Audio Director would partly serve as a quality control filter.

The audio aspect in digital radio would remain important, and enhancements to include other formats like perhaps Dolby Surround may be included in the strategy. To deliver the desired feel and sound of the digital radio services, the Music Director will work closely with the Programme/Station Director.

d) Marketing Director:
Working with the team, appropriate marketing strategies and promotion campaigns will be designed and implemented to support and enhance the activities and efforts of the programming and sales teams. Strategies, research and campaigns must be conceptualised and blocked off on a calendar format at least six months in advance of the coming year.

e) Sales Director:
Complementing programming, traffic and marketing, the sales director would have to

i) Create and implement strategies and sales campaigns.

ii) Prepare daily/weekly/monthly objectives.

iii) Organise sales teams, client networks, presentation sheets and rate cards to sell audio air space, DLS space and PAD/NPAD space along with promotional and programming sponsorship to clients.
d) Traffic Director:
The Traffic Director would have to ensure that commercials and advertising space are regularly
and accordingly scheduled based on the programming templates and according to specifications
determined by the programming, sales and marketing teams.

As revenue generation is essential, and daily programming/commercial reconciliation is
important in the auditing process, the Traffic Director would have to implement systems of
scheduling, monitoring and troubleshooting that will ensure the minimum of discrepancies in the
daily fulfilment of scheduled commercial advertising and sponsorships.

e) Public Relations Director:
Working with, supporting and complementing the teams and understanding the direction, vision
and objectives of the station, the PR Director will plan and implement appropriate material to
cover the education of the public on digital radio, prepare press releases, handle feedback and
manage crisis situations.

Dedicated teams must be created, as the work to be done is specific.

Once the teams are in place, systems must be organised and implemented to ensure that the teams
synergise and complement each other to achieve the vision and objectives collectively. Types of
services and content that can be made available for the operator based on the strategies and vision
determined by the programming, marketing and sales teams must be negotiated and obtained
from the service providers. All the appropriate copyright, licenses and permission would have to
be obtained at the same time.

Running concurrently, each team would have to programme, sell, market, inform and educate,
and configure and format material for proper delivery through the DAB system.
The programming may look something like this:

**NOW**

<table>
<thead>
<tr>
<th>Transmission per Frequency Channel</th>
<th>Current General Radio Programming Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 noon</td>
<td>News, weather &amp; traffic</td>
</tr>
<tr>
<td>12:05</td>
<td>90s R &amp; B fast tempo, bright mood</td>
</tr>
<tr>
<td>12:09</td>
<td>90s R &amp; B medium tempo</td>
</tr>
<tr>
<td>12:12 ab sourced text</td>
<td>Station ID/Jingle</td>
</tr>
<tr>
<td>12:12</td>
<td>80s medium rock</td>
</tr>
<tr>
<td>12:16</td>
<td>Station ID/Talk break</td>
</tr>
<tr>
<td>12:17</td>
<td>Information capsule</td>
</tr>
<tr>
<td>12:20</td>
<td>Station ID</td>
</tr>
<tr>
<td>12:20</td>
<td>Commercial Break</td>
</tr>
<tr>
<td>12:23</td>
<td>Station Jingle</td>
</tr>
<tr>
<td>12:23</td>
<td>80s ballad</td>
</tr>
<tr>
<td>12:26</td>
<td>90s medium R &amp; B</td>
</tr>
<tr>
<td>12:30</td>
<td>Station ID</td>
</tr>
<tr>
<td>12:30</td>
<td>News Update</td>
</tr>
<tr>
<td>12:33</td>
<td>Station Jingle etc...</td>
</tr>
</tbody>
</table>

**NEXT**

<table>
<thead>
<tr>
<th>Transmission per Frequency Channel</th>
<th>Possible DAB Programming Services from one Multiplex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station ID</td>
<td>90s R &amp; B fast/bright</td>
</tr>
<tr>
<td>90s R &amp; B medium</td>
<td></td>
</tr>
<tr>
<td>90s R &amp; B medium</td>
<td></td>
</tr>
<tr>
<td>ID/Jingle</td>
<td>80s m/rock</td>
</tr>
<tr>
<td>80s rock ballad</td>
<td></td>
</tr>
<tr>
<td>1D/International News Service</td>
<td>80s rock ballad</td>
</tr>
<tr>
<td>With related multimedia, text &amp; graphics</td>
<td>1D/Talk</td>
</tr>
<tr>
<td>Classical Music Station</td>
<td>90s R &amp; B medium</td>
</tr>
<tr>
<td>With related multimedia, text &amp; graphics</td>
<td>1D/Jingle</td>
</tr>
<tr>
<td>Local News &amp; Information Services</td>
<td>90s R &amp; B fast</td>
</tr>
<tr>
<td>With weather &amp; Traffic Information?</td>
<td></td>
</tr>
<tr>
<td>With related multimedia, text &amp; graphics</td>
<td>80s Classic R&amp;B</td>
</tr>
<tr>
<td>PAD &amp; NPAD</td>
<td></td>
</tr>
<tr>
<td>running concurrently</td>
<td></td>
</tr>
<tr>
<td>Listeners are free to select</td>
<td></td>
</tr>
<tr>
<td>programming according to personal</td>
<td></td>
</tr>
<tr>
<td>preference</td>
<td></td>
</tr>
</tbody>
</table>

Figure 5 Programming Formats Present & Future?

Each service in the DAB programming matrix has to be distinctly different with each service catering to a different need, service or audience profile.
Dr Wilson Oon, in a presentation at The Singapore DAB Forum held at Ngee Ann Polytechnic, outlined some of the technologies that CET Technologies Pte Ltd is currently researching. Among some of these key converging wireless technologies, he mentioned WAP, Bluetooth, Open OS, Packet Data and 3G alongside explorations of DAB’s potential.

As examples for multimedia applications, Dr Oon suggested as modes of transmission:

- XPAD for traffic information slideshows and interactive news services in HTML.
- Packet mode for broadcast websites using wireless portal services.

In terms of viewing bandwidth-intensive video that may be used on DAB receivers, Kent Ridge Digital Labs (KRDL) have developed the Video-to-Slideshow System (ViSS). A demonstration was given at the launch of RCS’s SmartRadio at the Four Seasons Hotel, November 1999.

This system selects key picture frames from a digitised video and presents it as a slideshow along with synchronised audio content. This will enable end-users two modes of viewing: full motion video on the broadband, and a slideshow on a narrow bandwidth. So already the technology is available for the transmission of video data on digital radio if there is a necessity for it. Since then, KRDL and RCS have undergone a trial test and a "Grant of License" agreement was finally signed to incorporate the ViSS technology into Radio Corporation's SmartRadio digital radio broadcast system from February 21, 2000.

Whatever the form, services would have to maintain programming and content consistency in outlook and interface on receivers that would occupy a space in each area of the professional’s life.
Conclusion

In this paper I have attempted to present some of the trends in technology that I feel will impact the production, marketing and management of radio broadcasting in particular. I am sure you will agree that technology should not dictate the daily operations in broadcasting, but as history has shown us, the influence of technology is great. What must surely be important is that as users of technology, we must not be slave to it or be too overwhelmed by it. It is obvious that there are many mundane tasks that have been relieved from our daily burdens through the benefits of automation. Systems and programme schedules have been fine-tuned through software schedulers that relieve programmers of sifting through mountains of music for that right blend of mood, tempo, era and genre.

Having said that and having painted a somewhat glowing picture of what digital radio could be, without technical and programming support, I would also add that some of what I have suggested may not materialise. Similarly, I am not advocating that programmers, DAB hardware manufacturers and software authors work tirelessly to actualise some of the features described above. Conversely, what has been described may also be just a fraction of what may be possible. We are at the beginning of this digital radio journey where anything is possible. I agree with my colleagues in programming that we have to be realistic and objective in our approach to digital radio.

The question raised if there are new audience needs to be addressed as technological developments enhance entertainment media is an important one. I have outlined some of the services that are currently available and will be available through terrestrial and wireless telecommunication services. Again, I have not attempted to describe them all. My view is that because of these advancements in telecommunications, listeners will perceive these as "new needs" that need to be satisfied.

It is true that with new innovations, initial exodus to the other camp will be a certainty until the novelty wears out and the demand for these services plateau. However I would say that this should not be an excuse not to look at developing broadcast technology and to evolve with the times and audience expectations within that environment.

Not all the software is available to actualise DAB potential. Broadcasters are still sceptical about DAB's importance and worth to the listener. However, transmitting slide shows and migrating
FM programming wholesale onto DAB is also not helping the situation as no one will pay thousands of dollars for a glorified “FM receiver” on a digital platform.

If a station were willing to invest time and effort in developing and researching for DAB programming and output, there will be a change in programming because linear programming may no longer be appealing. The digital culture is one of immediacy, random access, pull technology, mobility, multimedia output and speed in delivery. This may mean a leaner organisation that is made up mainly of programmers supported by a pool of producers and presenters who may not even be permanent staff. Some productions may even be farmed out to production houses and the remaining space on the transmission bitstream may be rented out to other service providers. The way ahead toward creating a functional system to optimise digital audio broadcasting technology in digital radio may follow a similar path as was cited in my case study of the RCS restructure. Taking the “three simultaneous agendas” of Professor C. K. Prahalad in corporate transformation, and as Stace and Dunphy described in their book Beyond the Boundaries (McGraw-Hill Companies Inc: 1997) the path toward actualising a full digital radio service may also utilise the Intellectual, Management and Behavioural Agendas. This is to enable the dissemination of a shared vision for the future radio broadcasting, strategising to actualise those objectives and tend to the responses within the organisation of shifts and changes within the organisation.

These are just explorations into possible configurations and scenarios. Digital Radio will be an exciting medium to work with. Listeners can certainly look forward to some dynamic services being offered through DAB. The question is when and how as currently DAB receivers are expensive and manufacturers are not committing to rolling out more sets nor are they bringing the price down. It is a chicken and egg situation.

At the end of the day, as we all know, through all this technology, that relationship and interaction with the radio personality is what distinguishes radio from other media. Radio as an audio medium is personal, immediate, a companion and intimate. I do not see digital radio, with its converging technology, as a second-rate digital television nor do I see it being less an audio medium. I believe that with digital radio, this experience can be enhanced and complemented by the multimedia capabilities that comes with the technology.
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