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NextRadio Outcome Leaves a Void

Effort to promote hybrid radio app and build FM chip awareness produces disappointing outcome

BY RANDY J. STINE

The founders of NextRadio thought they had the next big thing with FM radio on smartphones.

They secured financial backing for their launch effort from a consortium of radio broadcast groups. They paid millions of dollars to Sprint and other cellular carriers to activate FM chips in Android handsets they sold. With the NAB's help they launched massive public education campaigns. Even FCC Chairman Ajit Pai was in their corner, touting the importance of activating FM reception capability in the interest of public safety.

The point was to regain more FM portability by allowing listeners to tune to local radio stations on their smartphones via a built-in receiver chip,

An earlier promotional image for NextRadio.
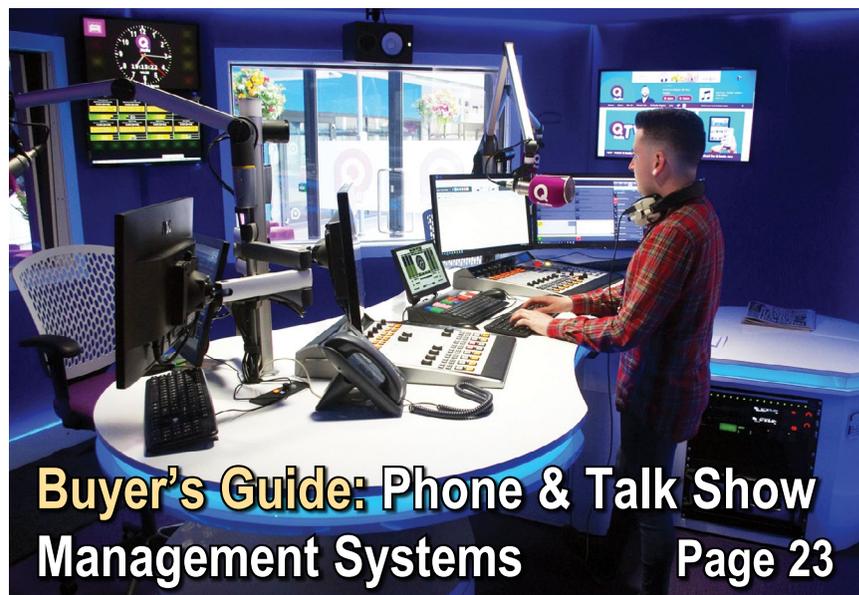
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e-Radio Looks for Its Big Break

After years of laying the groundwork, the company thinks commercialization is not far off

▶DATACASTING

BY JAMES CARELESS

Up to $55 billion annually. That's the estimate of value that could be created if U.S. FM stations were to add electrical appliance control messages to their data feeds. Revenue would come from utility companies remotely managing consumer power consumption via radio and be divided among various stakeholders, including the radio owners involved.

Such connectivity would allow a utility to reduce power consumption during peak periods, or instruct heaters and air conditioners to boost their usage during off-peak periods to "bank" this energy against the next high demand period.

E-RADIO

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The projection is a breathtaking one, given that the current revenue of the U.S. commercial radio industry is generally estimated to be anywhere from $13 billion to $21 billion. But it is the contention of Jackson Wang, founder and CEO of e-Radio Inc., that stations could have a big piece of that pie.

Radio World has reported about this "smart grid" company several times in the past decade and recently checked back in.

The Toronto-based firm is owner of a patented communications solution and operates wireless communications networks. Its FM receiver modules can be integrated into a variety of smart grid devices for residential, commercial and small industrial applications — water heaters, HVAC equipment and so on — using FM broadcasting as its communications platform.

A growing number of such appliances are capable of being remotely addressed now, thanks to their built-in "internet of things" data reception architecture; however, the e-Radio platform does not rely on the internet, but on those FM signals.

The company operates in the United States and Canada; it is also a member of the global RDS Forum and hopes to build a footprint in other markets. It has about a dozen full- and part-time employees and is privately held; Jackson Wang is majority owner.

The firm's energy management approach — which Wang said has been proven feasible in field tests with radio stations and power utilities — is to send the appliance device instructions via one-way FM RDS signals as required. According to the company, its Utility Message Channel via RDS on FM can reach over 300 million people and their devices in about two seconds. This allows utilities to reduce or boost electricity usage on a near-immediate basis.

"FM RDS provides a reliable, economical and easy-to-provision one-way path to these IoT appliances," said Wang.

"Appliances equipped with our small P2D 2045 FM receivers work immediately once activated, and generally do not require maintenance over time. In contrast, IoT-enabled appliances that rely on the internet have inherent privacy issues, are more vulnerable and failure-prone and could be disconnected any time the homeowner replaces their router."

The company is now conducting field testing with HD Radio as well.

DRIVING DATA REVENUE?

What Wang has been telling broadcasters for some time is that all this represents an unrealized revenue opportunity for FM broadcasters.

For many stations, the data infrastructure that transmits station

An e-Radio module in action atop a water heater

(continued on page 5)

NEWS

info such as identification and artist/song names has not produced revenue, whether we're talking about analog RDS or digital HD Radio.

Glynn Walden knows a lot about e-Radio. In his former role as CBS Radio senior VP of engineering and now as a consultant to its successor Entercom, Walden has worked with e-Radio to coordinate demo projects. He and Wang co-chair the National Radio Systems Committee's DRB Subcommittee, and Walden hopes to be an "active participant" in a rollout of the system on HD Radio.

He said that the problem dogging FM data is its one-way, one-to-many data transmission model.

We have proven that e-Radio works, and that it serves the public in a new way, saving utilities money while generating revenues for ourselves and radio broadcasters.

— Jackson Wang

"Every time we came up with a one-way data application that worked over HD Radio, someone came up with a solution that was deployable over a two-way channel like the internet," he said. "It made it pretty hard to monetize HD data and earn revenue from this data channel as a result. With IoT, there could be billions of devices only in need of one-way data."

Walden is convinced that Wang has found a way to make RDS earn money for radio broadcasters.

RDS

3. RDS RT+/RadioText parsed metadata

4. RDS RadioText metadata

5. RDS PS metadata

6. No metadata — just frequency/dial position stated in MHz; i.e., 88.1 MHz, 98.5 MHz, 107.9 MHz

EMERGENCY ALERTING

Emergency alerting via broadcast radio continues to be an important topic for the industry. A new section 8.3 discusses the HD Radio Emergency Alerting platform in detail. This is very helpful to broadcasters to

"Many IoT devices do not need two-way data communications to be successfully remotely-controlled," he said. "In many instances, FM data is the most efficient, economical and reliable way to send information to these devices. The proof that the messages were received and acted upon will be evident to the utilities when their power consumption falls or rises a few seconds later."

PROFIT POTENTIAL

Making money from RDS/HD by adding appliance control messages to their feeds is obviously attractive to broadcasters. What problems might it cause for stations who add these messages to their RDS feeds?

Ownership group Alpha Media in 2017 worked with e-Radio to test the appliance control messaging system via FM RDS.

"We ran pilot programs in Portland, Ore., over KINK(FM) and Wenatchee, Wash., over KKRV(FM)," said Mike Everhart, Alpha Media's director of engineering. "e-Radio came to us wanting to lease unused data capacity on our existing RDS carriers, to test remotely-controlling loads for the electric utilities. We were happy to help facilitate become familiar with this method of transmitting alerts to devices.

In addition, in Annex 1 RDS Use Cases, two new applications are discussed, including recent work from Global Security Systems' Earthquake Early Warning system, and Wisconsin Public Radio's implementation of Emergency Alert System text as an input to their Metadata Management System for displaying text-based EAS alerts via RDS and HD PSD.

Alan Jurison is a senior operations engineer for iHeartMedia's Engineering and Systems Integration Group. He chairs the NRSC Metadata Usage Working Group. His opinions are not necessarily those of iHeartMedia, the NRSC or Radio World.

Got a question about best practices for RDS? Email them to us at radioworld@futurenet.com and we'll ask Alan.

Energy Efficiency – FM Radios And Water Heaters

Hello, welcome and thank you for being a pioneer in energy efficiency

If you think FM radio and water heaters sounds like a funny pairing, you're not alone, but let us tell you more about this innovative technology and how you can help.

How can FM radio and water heaters work together?

• FM radio waves can reach almost every electrical device – and through that connection, radio waves can convey important information. Smart electrical devices can use this information to adjust how much power they are using and thus how much power they are pulling from the electric grid. So, by having your water heater receive FM radio messages, your water heater will know if it is a good time to use electricity and can crank itself up – or it can see that demand for electricity is high and reduce its electric use accordingly to save energy. You can learn more at e-Radio Inc.

Do I have a role in this?

• You could...one day. The visionary scientist, engineers and companies, like KINK

Broadcaster Alpha Media explained the concept on its website. "If you think FM radio and water heaters sounds like a funny pairing, you're not alone, but let us tell you more about this innovative technology and how you can help."

that for them."

Under the program, e-Radio provided both stations with UMC data feeds to insert into their RDS streams. Providing this service "was very low impact in terms of our operations," said Everhart. "We were able to provide them with secured access into our broadcast IT network to use certain data blocks on the RDS encoders, and it was just very, very easy to do. It took minimal involvement by our IT people to enable this."

As for the profit potential for radio broadcasters? "e-Radio paid us a reasonable sum for carrying their service within our RDS data," replied Everhart. "If that was extrapolated across the country, it could be a significant revenue boost for our industry."

Despite a decade of working to grow e-Radio and lobbying for awareness among broadcasters and utilities, Wang believes there is dramatic potential upside. "Utilities are an extremely conservative industry — read: glacial pace

E-RADIO

of change," he said. "However, just like glaciers, once momentum is finally gained, it can be unstoppable."

He points to a recently published BPA report as a key development; he feels it provides detailed technical and financial proof that the concept is sound and will put e-Radio onto the path of commercialization.

According to the announcement, this study — which involved e-Radio and eight utilities, such as Bonneville Power Authority and Portland General Electric — "demonstrates that smart water heaters can eliminate a major barrier to alternative energy growth while reducing the need for the majority of inefficient (mostly dormant) peaker plants at a cost a fraction of electrical storage devices … The multi-year study further showed that e-Radio's patented technology can help U.S. (West Coast) utilities satisfy their customers' overwhelming support for renewable energy as a source they expect utilities to provide."

How would the business work? In its current model, e-Radio would act as a "one-stop shop" for the utilities. "However, for full-scale commercial deployments, we are looking at other possible structures that are commensurate with additional contributions and investments from partners," Wang said.

Over two decades, the company has done test installations in approximately 30 markets. "All of them can be switched to be full-time Utility Message Channel stations on short notice as we commercialize." He said e-Radio has agreements with major private and public networks, some listed under the News tab on its website.

"The networks we've done agreements with over the years can cover the majority of the population in the North American continent. As many of them are part of a network of stations, more can be added quickly via our relations with their corporate management teams."

On the station end, the equipment needs would vary based on a broadcaster's existing equipment. "We have over the years accumulated many more tools to adapt each to be a live UMC station," Wang said. "It can range from no hardware at all, just network access security settings, to full encoder/servers etc."

And how much might a given station earn? Wang didn't give specific numbers to Radio World. "The lower part of the range is in line with existing market rates for the bandwidth required. However, some broadcasters are considering more of a partnership arrangement, which can be significantly more interesting than just being a bandwidth provider."

WHAT NEXT?

The company believes it has proven the viability of its FM RDS model in numerous field tests. It won a 2015 CES Innovations Awards for its P2D 2045

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A TECH CAREER

Jackson Wang, founder and CEO of e-Radio, was an aerospace engineering officer in the Canadian military; he then worked as a systems engineer with Litton Guidance and Control Systems on the U.S. Tomahawk Cruise Missile program and at the Ontario Ministry of Transport as a senior project manager specializing in public/private partnerships.

He co-chairs the U.S. National Radio Systems Committee's Digital Radio Broadcasting subcommittee. According to his bio, he also leads the Broadcast subcommittee of the Home to Grid (H2G) Domain Expert Working Group of the U.S. Smart Grid Interoperability Panel. He was a founding committee chairman of Advanced Traveler Information Systems of the Society of Automotive Engineers and past chair of International Organization for Standardization (ISO) TC/204 WG10.1 subcommittee on advanced traveler services integration. He's the principle author of numerous U.S. and international patents in the field of broadcast-based datacasting.

NEWS

How Smart Will AI Get?

Welcome to the era of contextual awareness

▶ **TECHNOLOGY**

BY GREG SCOBLETE

While artificial intelligence has been kicked around academic computer science departments for decades, it's enjoying an unprecedented public moment as the fruits of machine learning and neural networks become an inescapable part of our daily lives.

At CES 2019, products that leverage some form of artificial intelligence were expected to be ubiquitous.

And, according to analysts tracking the development of artificial intelligence, we'd better get used to it.

IN THE RECIPE

To understand how AI will evolve, it helps to think of it less as a thing by itself and more as an "ingredient technology," said Sayon Deb, senior research analyst at the Consumer Technology Association. Like salt, it will be sprinkled liberally into in a wide range of products, software and services but not in the same way or to the same degree. Asking how big the demand for AI will be in consumer and business markets is a bit like asking about the demand for USB ports, Deb noted. "It's so large because it's everywhere."

In the near-term, look for AI-powered improvements to arrive in any device that uses sensors to interact with the real world, in particular, via voice-based interfaces, predicted Bob O'Donnell, president and chief analyst at TECHnalysis Research. Advances in natural language processing will enable devices such as smart speakers to better understand and respond to verbal commands. It will also deliver voice interaction to new product categories. The spread of Amazon's Alexa is a good example of the trend, Deb said.

Any device with a camera will be the beneficiary of advances in machine vision and neural network-powered object classification, enabling cameras to differentiate objects in a scene, recognize human faces and more. Home security cameras, for instance, can learn to distinguish home owners from visitors and analyze exterior behavior for signs of trouble, O'Donnell said. While sophisticated facial-recognition technologies do raise privacy concerns, some of the early use-cases (like unlocking your phone) have proven very popular among consumers, Deb added.

One of the big shifts that's underway concerns how AI devices acquire knowledge.

Thinkstock/Rafik

Improvement in edge-device intelligence will mean a more personalized experience — devices that are smart enough to learn your unique patterns and even attempt to anticipate them, O'Donnell said.

Today, much of the machine learning that powers AI capabilities is performed in the cloud, where developers can harness massive amounts of computing power and ingest huge data sets that no local desktop or tiny electronic device has the memory or processing power to cope with. The results of this learning get loaded onto so-called edge devices (your security camera, your smart speaker) which then interact with the world, but no longer acquire any new knowledge about it.

IT'S IN THE CONTEXT

But edge devices will increasingly be able to perform their own local learning, O'Donnell said.

Chips from NVIDIA, AMD, Qualcomm and others are increasingly capable of running AI algorithms and conducting some sparse local learning without a server farm. This improvement in edge-device intelligence will mean a more personalized experience — devices that are smart enough to learn your unique patterns and even attempt to anticipate them, O'Donnell said. You could, for instance, have user interfaces on devices that refine themselves on the basis of real-time feedback from the user.

This so-called "contextual aware-

ness" will be extremely important for autonomous vehicles and personalized robotics as well, O'Donnell said. Both need an immense of data to navigate on their own, but the real world constantly throws new data at them. Vehicles and/or robots that can perform localized learning but then upload those results to the cloud will help in the collective effort to make robotic devices more intelligence.

This two-way communication does raise privacy concerns, particularly when it comes to the kind of granular, location-based data that contextually aware devices can generate, O'Donnell said. Ironically, the better devices get at edge learning, the less they'll need to send personalized data up to the cloud, he added.

While personalized devices grow more responsive, AI will also be leveraged by more businesses to automate and augment the work previously done by humans. According to a recent report from Forrester Research, natural language processing will combine with robot process automation to build more responsive chatbots, organize unstructured business data and automate a variety of business tasks.

This business automation naturally gives rise to concerns that as AI gets smarter, we'll collectively be automated out of a job. One widely cited study from Oxford University's Martin School noted that 47 percent of jobs, including many white-collar professions, are vulnerable to automation. CTA's Deb sees those fears as unfounded, at least for now. What studies like the one from Oxford can't measure is the new jobs that AI may create, Deb said.

"There's bound to be growing pains," Deb said, "but the potential of AI is boundless."

This article originally appeared in the CES 2019 Daily.

E-RADIO

FM radio module in the Tech For A Better World product category.

Still, the radio industry cannot profit from e-Radio's technology until it is widely deployed by utility companies nationwide; without that deployment, e-Radio will not be leasing RDS capacity on a major scale. No major deployment means no $55 billion a year to the radio industry. Wang hopes broadcasters can be partners in spreading the word.

"We need radio broadcasters to help us get the news out about our appliance-messaging technology, and to help us begin full commercial deployments with utilities across the

United States, Canada and the rest of the world," he said.

As an example, Wang points to an information web page posted by Alpha Media at *www.kink.fm/energy-efficient/,* which provides visitors with information about the pilot program and its possible future benefits. Alpha also ran public service announcements on air and on its website.

"We would love to work with broadcasters to do community outreach and to work with them to engage corresponding local utilities as potential customers for our services," Wang added. "Radio and utilities are both local [and] market-focused, and have special opportunities to connect.

"We have proven that e-Radio works, and that it serves the public in a new way, saving utilities money while generating revenues for ourselves and radio broadcasters," he concluded. "All we need now is a widespread commercial deployment, to deliver substantial benefits for everyone."