

## **Bioelectronic Medicine: Creating New Treatment Paradigms**

By Chad Bouton

Technology has become woven into virtually every aspect of administering care to patients. Electronic health records are being harnessed to identify ways to improve care, with predictive algorithms under development to warn us of potential health issues. Advances in wearable technology help both patients and medical professionals track vital health information, while new laboratory instrumentation and artificial intelligence aids in applications ranging from detecting infections to diagnosing cancer. Technology is also being used to treat an increasing number of medical conditions. A rapidly growing field, called bioelectronic medicine, uses technology to modulate the nervous system to address disease and injury without the use of pharmaceuticals. Initial positive clinical trial results are showing that the field is on its way to being a tangible alternative to certain medications. While it's hard to predict what will happen even within the next several years, it is important for health care leaders to make it a priority to stay abreast of new developments in bioelectronic medicine as they occur because it has the potential to have a major impact on how we administer care. Along with its impact on care, hospital organizations which have a research component should be aware of the field as research related to bioelectronic medicine has the potential to attract additional outside investment from donors and industry.

### **Harnessing the nervous system to treat disease and injury**

Before getting into what the future holds, it is important to understand the foundation of bioelectronic medicine and some of the recent discoveries as it is very different than drug research and development. Bioelectronic medicine combines neuroscience, molecular biology and bioengineering to tap into the nervous system to treat different conditions.

One of the initial discoveries in the space was made in the late 1990's by Kevin J. Tracey, MD, President and CEO of the Feinstein Institute for Medical Research who found that the vagus nerve is involved in controlling inflammation. This discovery led to the concept that we if we can interact with the nervous system we may be able to treat conditions involving inflammation. With inflammation being a component of many medical conditions, the list is long. Crohn's disease, lupus, rheumatoid arthritis (RA) and paralysis are among the initial conditions identified as benefiting from bioelectronic medicine.

But how do we tap into the nervous system? The answer is technology. Technology allows us to interact with the nervous system through specialized devices which emit and sense electrical impulses, the fundamental unit of communication throughout our vast neural networks. It is important to note that bioelectronic medicine devices are based on deep molecular research to understand fundamental mechanisms, while combining fundamental neuroscience and bioengineering principles, to create effective treatments.

In an effort to develop smarter and new diagnostic devices in the field of bioelectronic medicine, researchers are learning the language of neural signals so that we can listen for signals of disease and effectively treat injury.

There are many remaining questions and challenges in the field of bioelectronic medicine as it continues to grow. Development of improved neural implants is an active area. Identifying ways to make devices perform over longer periods reliably is crucial to their success. Also, further mapping of the human nervous system is a remaining frontier. There are many remaining mysteries when it comes to the way the brain and the peripheral nervous system function due to their sheer size and complexity. Many opportunities to further our knowledge and technology development are currently available in the field of bioelectronic medicine. Hospital staff can look for opportunities to get engaged in clinical and/or laboratory research to help drive the field forward.

### **Technological Developments Accelerating Discovery**

While the initial discovery of the link between the nervous system and inflammation has been around for some time, recent innovations in machine learning are accelerating bioelectronic medicine target discovery and device development. This is because an essential component to harnessing the nervous system is being able to analyze large amounts of data on how the nervous system communicates with the body, to identify signals of disease as well as health.

An example of this can be seen in the Center for Bioelectronic Medicine at the Feinstein Institute where machine learning was a component of recent research which successfully decoded specific signals related to inflammation. Researchers decoded the neural signaling of two molecules that control inflammation called cytokines— IL-1 $\beta$  and TNF – in the vagus nerve of mice and found that each cytokine triggered a unique response signal. Understanding that each molecule and process has dedicated signaling, researchers can use the neural decoding methods from this study to identify the neural signaling of a variety of other medical conditions in future bioelectronic medicine studies. These findings can be used as a basis for the development of devices which will employ the latest microchip technology to support the processing power of large amounts of data while being small enough to be planted on the nerve or to be housed within a portable device.

While much of the discoveries published over the recent months regarding bioelectronic medicine are related to implantable devices, it is also important to note that the expansion and innovation of wearable technology will also play a major role in the creation of bioelectronic medicine therapies. As textile-based electronics begin to emerge, we will see ‘smart clothing’ applications multiply. For example, we could see shirts that can monitor our heart rate and blood pressure while measuring our stress levels through galvanic skin response. Not only will diagnostic applications rise, we will

begin to see therapeutic and rehabilitation devices that can potentially help with post-surgery recovery and even after a stroke.

### **Industry driving clinical trials**

These discoveries made in the lab are becoming a reality thanks to investment from industry. Leaders like Alphabet Inc.'s Verily and GSK (GlaxoSmithKline) forming Galvani Bioelectronics, and others, including Medtronic, Teva, Boston Scientific, GE, and United Therapeutics recognize bioelectronics as a growing sector that will present alternatives to the biochemical therapies traditionally offered Big Pharma in the treatment of many diseases and conditions. As such they are supporting the development of bioelectronic medicine devices and clinical trials. Major health organizations and hospital systems like Northwell Health in New York are also dedicating research budget to aid industry in identifying therapeutic targets and device development.

It is important to note that there are advantages for health organizations to conduct both clinical trials as well as translational studies in this sector as they can lead to additional benefits for hospitals and patients. Discoveries being made in the lab can be patented and licensed to outside companies for development which can lead to additional revenue for the health organization. In fact it is the Feinstein Institute's discovery of the inflammatory reflex that led to the development of new treatment methods which were subsequently licensed to SetPoint Medical. Initial clinical study results have demonstrated the efficacy of this new approach in rheumatoid arthritis (RA). SetPoint recently hosted a clinical trial in Amsterdam which found that active electrical stimulation of the vagus nerve inhibits TNF production – a key contributor to inflammation in RA patients and significantly attenuates RA disease severity. These positive findings were published in ([PNAS, July 2016](#)), resulted in SetPoint launching trials in the US in 2018 for RA as well as supporting trials in Europe for Crohn's disease.

Conducting research within a hospital system also allows researchers to collaborate with clinicians in the field to provide patients with access to cutting-edge care found through clinical trials. An example of this is a recent study examining bioelectronic methods in the treatment of traumatic injury. In this first-of-its-kind study, volitional hand movement was restored in a completely paralyzed male participant through the use of a brain implant. The experimental device decoded brain signals and re-routed them to affected muscles so movement was regained — through thought alone. These groundbreaking results were published in *Nature* in April 2016.

### **What's in store for the future?**

Technology continues to expand our ability to treat difficult conditions which have no cure, or where there are limited treatment options. If we maintain the current pace of discovery, we expect to see more bioelectronic medicine treatment options becoming available over the next five years. It is important that hospital professionals stay on top of the developments as they have the potential to greatly change and improve how we

deliver and administer care. As mentioned, we're already starting to see movement in Crohn's and RA therapies and should start to see more about lupus and treatments for paralysis.

While we're still some time away before bioelectronic medicine treatments are as common a therapy as a pacemaker, there are a growing number of clinical studies which are becoming available. It is important for hospital executives to ensure that their staff are current on the latest research and studies being conducted in bioelectronic medicine as we expect more patients will be inquiring about these studies and if they are viable treatment options for their condition.

If your hospital has a research component, this awareness of bioelectronic medicine can also lead to new collaborations between your research teams, other institutions or industry. Depending on the area of research being studied at your facility, this has the potential to attract donors and industry investment.

To aid with the connection to industry while protecting discoveries made by researchers, hospital executives should look to have dedicated staff who help with patenting. Having this support aids researchers while also laying the groundwork for licensing opportunities for the researcher and the health organization.

As with many new technologies, it is also important to stay ahead of any issues and to encourage discussions about the challenges and potential ethical questions. Holding conferences and open events related to bioelectronic medicine will help give medical professionals the latest information and also educate the public on current research and clinical results. This will help address concerns and provide insight into new clinical studies and treatment options that are becoming available.

As bioelectronic medicine continues to take hold and is proven as an effective diagnostic and treatment method, we may soon see medical professionals reading nervous system signals either by implanted or external devices to diagnose disease. By being aware of the developments in this space, hospital professionals have the opportunity to be the first to offer patients access to this care while also being positioned to collaborate in this research to bring therapies to patients sooner.

## **Foodservice: Creating an Immersive Guest Experience with Candy & Snacks**

By Andrew Reitman

There is more pressure than ever before for foodservice establishments to identify ways to create memorable guest experiences. Every aspect of a vacation is shared on social media, from meals, to snacks, to drinks, to room amenities. Corporate and campus dining is more than a place to get a sandwich, but rather a bragged about benefit. Transforming resorts, restaurants and corporate dining to a destination could be as simple as looking to your candy and snack assortment.

Foodservice has enhanced meal options, bringing in exotic foods from across the globe. But only recently have they really looked to their candy and snack assortment at retail. By elevating their snack assortment, foodservice sites can help generate lasting impressions and sales by creating a wow factor.

This isn't a matter of completely re-vamping entire food assortments and menus. It's more about considering how appropriate pairing and placement of certain snacks can help create an immersive experience. Here are some ways to create a big impact — and sales — with candy and snacks.

### **Pairing Global Snacks with Global Food Stations & Quick Service**

Across the board a big ask from customers is adventurous, global flavors. Gone are the days of simple deli stations. Customers want high-quality dining (think the Whole Foods experience) at the job, at school too — even from their Grab & Go spots on resorts.

Two areas' flavors that are very popular now — Asia and Mexico.

For some time, we have seen sushi stations/quick service as a highlight of many dining programs. An easy way to give this area a refresh and create upsells is to incorporate Japanese candy and beverages to pair with the sushi.

Japanese candies offer unique textures and exotic flavors, helping add some excitement. There's Konpeito Star Candy, for example, with an extra crisp crunch and star shape. Or the bright citrus yuzu flavor found in a variety of candies and Japanese sparkling beverages.

Some Japanese candy and beverages are interactive too, creating easy social media moments. Take Ramune soda for example. Each bottle comes with a marble stopper that's pushed in for a signature clink. There's also peelable gummies with their thin strips that can be torn off.

Sometimes adding candy and snacks can bring new eyes to some of the more classic food stations. Take Mexican candy. It's currently a top trend on social media channels like TikTok, loved for its blend of fruit flavors with tangy tamarind, bold and spicy chili, as well as Chamoy. This has the potential to generate excitement particularly for mainstays like a taco bar or a burrito station.

The fun thing about international candies is there isn't that much clever merchandising required to add excitement. Here it's more about proximity and placement since many international candies have bold graphics that will attract attention.

### **Coffee Bar: Perk them Up with Single-Serve Items**

Another area ripe for upsell opportunities are coffee bars/stations.

Visits to the coffee station are about a recharge from that morning/afternoon slump. Many coffee bars are self-serve, but you can create a coffee-house like experience by offering premium single-serve chocolates and other snacks.

Over the last few years there has been a shift in customers wanting little permissible everyday indulgences. Here instead of completely cutting indulgent chocolates and snacks out of their diets, consumers are looking for balance with portion-sized chocolates and candy. This has led to a rise in single-serve confection options so they can treat themselves.

That's why single-serve chocolates are a great upsell option for coffee stations. Not only does chocolate go great with coffee. The smaller portions are more a portable snack as coffee is normally something enjoyed on the go. Here it's all about chocolate classics, like chocolate covered pretzels, salted caramels and chocolate covered graham crackers.

While coffee might be a Grab & Go, you can still create an elevated experience for customers through effective merchandising. By simply placing the single-serve chocolate in baskets or tubs, it helps to add some perceived value that will have customers picking the items up.

Also consider adding alternatives to coffee for their caffeine fix like protein bars with caffeine.

### **Offer A Spa – Like Experience with Groupings of Premium Wellness Items**

The trend of little indulgences might be taking off, but better-for-you foods and snacks are still in top demand. This is one category where grouping like foods can create major impact.

Consider creating a wellness oasis — an area where all the foods and snacks containing the latest trending claims — are grouped in one place. This is where you can have your low sugar, minimally processed, sustainable and allergen-friendly items.

A trending texture for 2025 is crunch. So, nut and seed mixes are a great option for your wellness assortment. Traditionally, nuts are minimally processed to let their rich flavors shine through, fitting the demand for minimally processed foods. Nuts also have a reputation as a healthy food item. So, if there's a large assortment, consumers will instantly associate with better-for-you without the need for much signage.

If you do look to add nuts to your wellness oasis, try to stick to dry roasted nuts. Dry roasting means the nuts are cooked without added oil, helping to keep the calorie and saturated fat count down.

### **Create Moments with Exclusive Branded Items Year-Round & Seasonally**

Sometimes it's not the merchandising that creates an immersive experience — it's the exclusivity and branding. Private label branded candy and snacks are a great way to position properties as a destination while potentially spurring repeat business.

If customers think that the resort or dining place is the only destination for a certain snack, it might tip the scales for repeat bookings.

Private label mint tins with the business' branding are an easy entryway into a private label snack program while also being a versatile option. These can be sold as a souvenir at the gift

shop, given out as a part of a loyalty program, or even as a little perk during breakout sessions at corporate meetings or conferences at resorts.

The mints space is getting innovative with flavor. So, there is an opportunity to pick a signature flavor that would make the business a standout.

Another way to add to the exclusivity is with seasonal private label items. There's always an urgency to purchase around seasonal items as they're only around for a short time. Consider adding signature seasonal packaged items like peppermint bark or foiled chocolate presents to holiday brunches and in property gift shops.

### **Sweeten the Upsell with Cocktails & Baked Goods Adorned with Candy**

In the age of social media, exceptional flavors mean nothing without a dramatic presentation. That is where candy garnishes for cocktails and other dessert items can help create a memorable moment with minimal effort.

A giant gummy shark in a tropical cocktail at a seaside resort will have visitors pulling out their phones to snap a picture. Gummy brains or pressed candy in Halloween shapes topping a signature fall cocktail helps create fun and make the business stand out. It can also be as simple as rimming cocktail glasses with popping candy for select cocktails.

When selecting candy to add to your beverage or dessert program, consider the trends. Espresso martinis are very popular at the moment, so an espresso martini adorned with chocolate covered espresso beans creates a premium experience customers will pay more for.

Draw cues from candies playing well on social media and consider adding to your food program. Like freeze dried candies adorning a cupcake or adding Chamoy coated gummies to a margarita.

### **Let the Guest Be Part of the Experience with Self-Serve Stations**

Self-serve candy stores have been around for a long time. But more and more resorts are adding smaller-scale self-serve candy areas as an on-site activity.

For a truly unique experience, go beyond the candy to self-serve trail mix stations. Resorts and campuses are often filled with active outdoor activities, having visitors looking for fueling snacks. Trail mix stations bridge both worlds, offering a better-for-you option with nuts and fruit, while also leaving the door open for fun, indulgent mix-ins like gummies, candy buttons, chocolate covered nuts.

Create a tiered program with premium items like chocolate covered gummy bears going for a higher price.

Snacks and candy items have always been primed for upselling. But in today's foodservice industry, candy and snacks are more important than ever to enhance the guest experience. With careful selection and pairing along with food offerings, visitors can be kept immersed in exotic flavors and exclusive feelings from start to finish while generating more sales.

*Andrew Reitman is Executive Vice President, National Brand Confections for Nassau Candy, a leading importer, distributor and manufacturer of specialty and private label confections.*

## **Appealing to Generation Alpha**

They're only 13 but have the potential to surpass the buying power of their parents and grandparents. Generation Alpha (that's anyone born between 2010 and 2025) will be one of the biggest generations ever and they're already flexing their buying power.

Even at their young age, Generation Alpha has \$360 Million in disposable income, according to Bloomberg. And their influence over household spending already stands out.

Financial education expert, Currency Marketing reported that the annual spend for kids and teens in the US was around \$24 billion, or \$450 each. The top categories they were spending on — gaming, retail, tech, fashion — and food.

Beyond their sheer size and large spending power, Generation Alpha is changing how we think of packaging and product rollouts. Nassau Candy experienced this change firsthand when developing its Clever Candy Everyday Packaged Line of gummies.

Today it's more than the product itself. You need to examine brand mission, brand values, and how your brand connects with the consumer.

Here's some of the key takeaways Nassau Candy uncovered about Generation Alpha.

### **They're Super Visual**

In an age of smartphones, tablets and video games, it's not surprising that Generation Alpha is very visual. 65% of kids ages 8 to 11 own or have access to a mobile phone, according to Currency Marketing.

What this means to brands is that packaging and product shape have a big impact on product appeal. Here think bold colors and color combinations, and dynamic shapes. The Clever Candy Packaged Line used layered splats in vibrant colors on its packaging to mimic the visual interest that you might see on those screens.

Since Generation Alpha are savvy shoppers, they want to see the product as well. Consider including product images or windows as part of package design and marketing materials.

We all know that packaging is the first step to getting their attention, but what's inside needs to be exceptional too. This goes for shape as well as flavor.

Generation Alpha is inspired by their Millennial parents, so they are a little more adventurous with flavor, according to flavor company, Fona.

While they might not be ready for bold spices just yet, Generation Alpha is looking for something beyond the norm. The Clever Candy line offers some unique flavor combinations like cherry, cola and lime as well as caramel. The gummies themselves feature unique shapes like sharks, frogs, turtles and whales.

### **They Love Interacting with Brands & Peers**

This generation was born at a time where social media is the norm. Generation Alpha has never known a time where they didn't have direct, immediate access to friends, family — even brands.

Because of this, they're looking for their interaction with brands to go beyond basic posting or liking a comment on social media. Companies have to create avenues for Generation Alpha consumers to interact with their brand and product, keeping them engaged and making them feel connected.

While social media might drive them to your product, the product itself needs to be post-worthy. Think fun shapes that create dramatic social media posts. Or a fun surprise, whether it be from the product itself or packaging they can react to.

This doesn't mean you have to be creating social media contests daily to create a lasting connection with Generation Alpha consumers. Upping engagement can be as simple as adding an interactive element like a joke or riddle to every package, that can be shared in-person or on social.

### **They want their Brands to be Socially Conscious**

Growing up with Gen Z and Millennial parents, Generation Alpha is more socially aware at a younger age than any other generation. What this means for manufacturers is they want to connect with a brand's story as much as they do with product.

66% of Generation Alpha admit they like to buy from companies trying to do good in the world, according to a survey by advertising company, Wunderman Thompson. How a brand makes the world a better place has many faces.

It can be as basic as donating a portion of profits to non-profits that support communities/areas of need, like the environment, hunger, animal welfare, etc. Warning — what you're supporting not only has to be a cause important to Generation Alpha, it should be authentic to your brand.

One of the biggest causes for Generation Alpha is the environment. You can differentiate yourself from the competition by offering your products in recycled packaging, and/or made with recyclable or upcycled materials.

In the food space, supporting the environment can go little farther. Generation Alpha is looking for brands to employ sustainable farming and sourcing practices whenever possible. If the factories creating these products are certified for their sustainable manufacturing practices, even better.

### **Their Parents Are an Important Part of their Decision-making Process**

Remember, as much as Generation Alpha is a consumer powerhouse, they're still children. So, parents are still a big part of their purchasing decisions.

This fact is even truer in the food and beverage space. 87% of parents admit their children influence their purchase decisions, on food and drink categories, according to Currency Marketing.

Usually, parental involvement is looking for online reviews, or references from friends and family before making the purchase. Any instances where you can have your product reviewed can be beneficial.

Even though it seems like a two-pronged marketing approach – Millennials and their Generation Alpha Children share similar values. Like sustainability, social activism, etc., so the messaging can be similar.

Don't let their size and age fool you. The oldest members of Generation Alpha might only be tweens, but they are already demonstrating they're on the path to being powerful, savvy consumers.

Manufacturers don't have to make a total pivot, but they need to be more critical about the look of their product, their brand values and how they connect with customers. If you can successfully balance all these elements, you have the potential to have a lifetime brand loyalist.

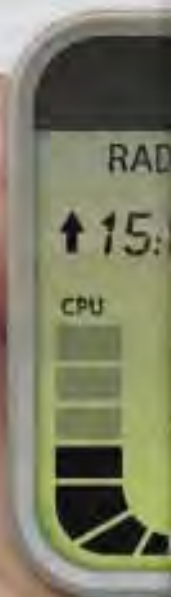
Dana Rodio is Director of Brand Strategy at Nassau Candy, leading wholesale manufacturer, importer, and distributor of confectionery and gourmet food products, including packaged, specialty, and bulk candy, as well as candy and chocolate gift boxes.

# Building a file-based workflow

BY KIRK MARPLE

The following steps, when done correctly, help prepare content for distribution formats.

**W**hile the process for building a file-based workflow is typically thought of as nonlinear, a series of steps should be followed in a linear manner to ensure successful results. The steps — ingestion, indexing, quality control (pretranscode), transcoding, quality control (post-transcode), publishing, distribution and notification — when done in the proper order, help to better prepare content for the various distribution formats, including online, video on demand and cable. Depending on the different transcoding processes that are being performed, this workflow can be a combination of both hardware-based and software-based technologies. Also, several other considerations to keep in mind when selecting elements for your workflow are the turnaround time, the amount of files being managed and the amount of staff available to help with the process. Let's take a look at each of the steps involved so you can better understand their benefits.





Metadata and asset management are essential organizational elements of a file-based workflow. RadiantGrid's catalog management feature (pictured here) supports the searching, browsing and filtering of ingested assets.

### Ingestion

One thing to always keep in mind is that all content must be brought into the workflow either via satellite transmission, a file from an editing workstation, or physical media such as a videotape, CD or DVD. When selecting software to handle a file-based workflow, it is best to select one that can handle the majority, if not all, of these ingestion formats. During the ingestion, files are preprocessed into a form that is optimal for the transcoding stage. This can mean breaking down or demuxing files into essence formats. From this, mezzanine streams can be made from the source media; these are optimal for transcoding.

### Indexing

While ingestion creates the assets in the repository, indexing — the next step — creates the metadata that is attached to those assets. Via indexing, all media-specific metadata (i.e. file length, frame rate, codec, etc.) is pulled out. With metadata being a big portion of the file-based communication process, the best software solutions are those that offer a means to easily manage the data and allow for changes to be

easily made. Many software platforms offer catalog management, which allows for all items associated with a file (a thumbnail view, a preview version, the master) to be packaged and delivered along with metadata throughout the workflow along with the ability to search by any of these connected items.

### Quality control pretranscode

Before starting the transcoding process, the file needs to be checked to make sure that all elements of the ingested file are correct, such as the frame size and the bit rate, or there will be issues later on. There are two ways quality control can be performed. One is through an external or Web-based program that can check the policies set for the project. A second option would be to use a software program that can be integrated into the workflow. The amount of time you have for this process is going to help determine which option works best for a particular workflow.

### Transcoding

All audio, image, closed-captioning and subtitle processing happens in

the transcoding phase. Transcoding can take place all within the software platform or within a combination of software and external hardware. Many transcoding software platforms now include audio and video processing, which were typically solely found in hardware previously. Because the audio and video processing is now in the software, this allows multiple transcoding processes to go on simultaneously within the platform, which can speed up the process, particularly when working with a large number of files.

For those looking to use a combination of hardware and software processors, transwrapping (also called transmuxing) is another option. With transwrapping, the source file is ingested, and the video and audio are demuxed into the essence streams. This allows either the video or the audio to be processed within the platform; then both are muxed back together, and the transwrapped file can be processed using hardware processors.

Another feature to consider is the ability to assemble one or more assets into the final product for distribution. One common scenario where this feature would be used is to stitch a black slug, with a promotional interstitial, with the master asset (movie, TV show, etc.), with a trailing interstitial, and finally with a trailing black slug. Some developers also offer multitrack assembly; this can be used as a basic nonlinear editor so that different takes of the same project can be put together.

Along with the software and what processes are handled within the platform, another factor to consider is the actual transcoding process being used and how the content is being distributed throughout the server. Some software distributes transcoding tasks across the transcoding farm, as capacity becomes available. Though effective, this can limit the speed at which a file can be converted. A second option is grid transcoding, which allows source content to be

transcoded in parallel across all available transcoding resources, and can speed up the transcoding process.

### Quality control post-transcode

While the transcode may have already been completed, it doesn't always guarantee a conforming file. Similar to the quality control pre-transcode, this stage is where the transcoded file is validated. Like quality control testing pretranscode, this can also be performed either by an external program or one within the software platform.

### Publishing

The publishing step is where the transcoded files and metadata are taken into the repository and packaged for delivery. Publishing doesn't touch the actual media file, but it may put the files into some special directory

structure or rename them so they are properly noted for output.

### Distribution

The second to last step of the process is distribution, which takes the generated files, the transcoded files and possibly the metadata, and pushes them out to a file server somewhere. Then, the files could be posted to a website, sent to an online cable provider, made available to an online music download vehicle such as iTunes for distribution and purchase, or to online video services such as Hulu.

### Notification

Even though there is a lot of software involved in a file-based workflow, things never happen in a vacuum. The final stage, which is notification, can either be handled by humans or by an automated process. For example, this could mean simply

sending an e-mail, sending a message via a Web service or a notification system within the software platform telling the final user that the files are there. The amount of people utilizing the files and their general proximity will determine the best solution.

Clearly, a file-based workflow is a combination of old practices and new. Software allows much of the process to now be automated, but there will always be a human element required for the workflow. An example is dropping a file out of one piece of software and loading up another piece of software, transcoding it and putting it in another folder. Having a better understanding of the various elements involved in a file-based workflow will help you create better results for your projects and give you the ability to better manage your content. **BE**

*Kirk Marple is president and chief software architect of RadiantGrid Technologies.*

## NEW TAHOMA-LX Multiviewers

### • Built-in Routing Switchers - any input source to any Multiviewer output

- Built-in CATx extenders (1080p @ 115 feet)
- 4 to 32 auto-detect HD / SD-SDI video inputs (3G Ready)
- 16 channels of embedded audio per video input
- 4 channels of discrete audio per video input
- Multiple outputs in DVI, HDMI or VGA
- Output resolutions up to 1920 x 1200 / 1080p / 2048 x 1080
- SDI Output
- Skin Technology for customizable user interface
- Cost-effective solution with 3-year warranty
- 18 models available - 1 RU and 3 RU (depending on model)



## NEW TAHOMA-LI Multiviewers

### • Looping Video Inputs - for further distribution or duplication of inputs - including 3G up to 140 meters

- Built-in CATx extenders (1080p @ 115 feet)
- 4 to 16 auto-detect HD / SD-SDI video inputs (3G Ready)
- 4 to 16 auto-detect PAL / NTSC Composite video inputs
- 16 channels of embedded audio per video input
- 4 channels of discrete audio per video input
- Multiple outputs in DVI, HDMI or VGA
- Output resolutions up to 1920 x 1200 / 1080p / 2048 x 1080
- SDI Output
- Skin Technology for customizable user interface
- Cost-effective solution with 3-year warranty
- 12 models available - 1 RU and 2 RU (depending on model)



[www.apantac.com](http://www.apantac.com)

+1 503 616 3711 • [info@apantac.com](mailto:info@apantac.com)

**APANTAC**