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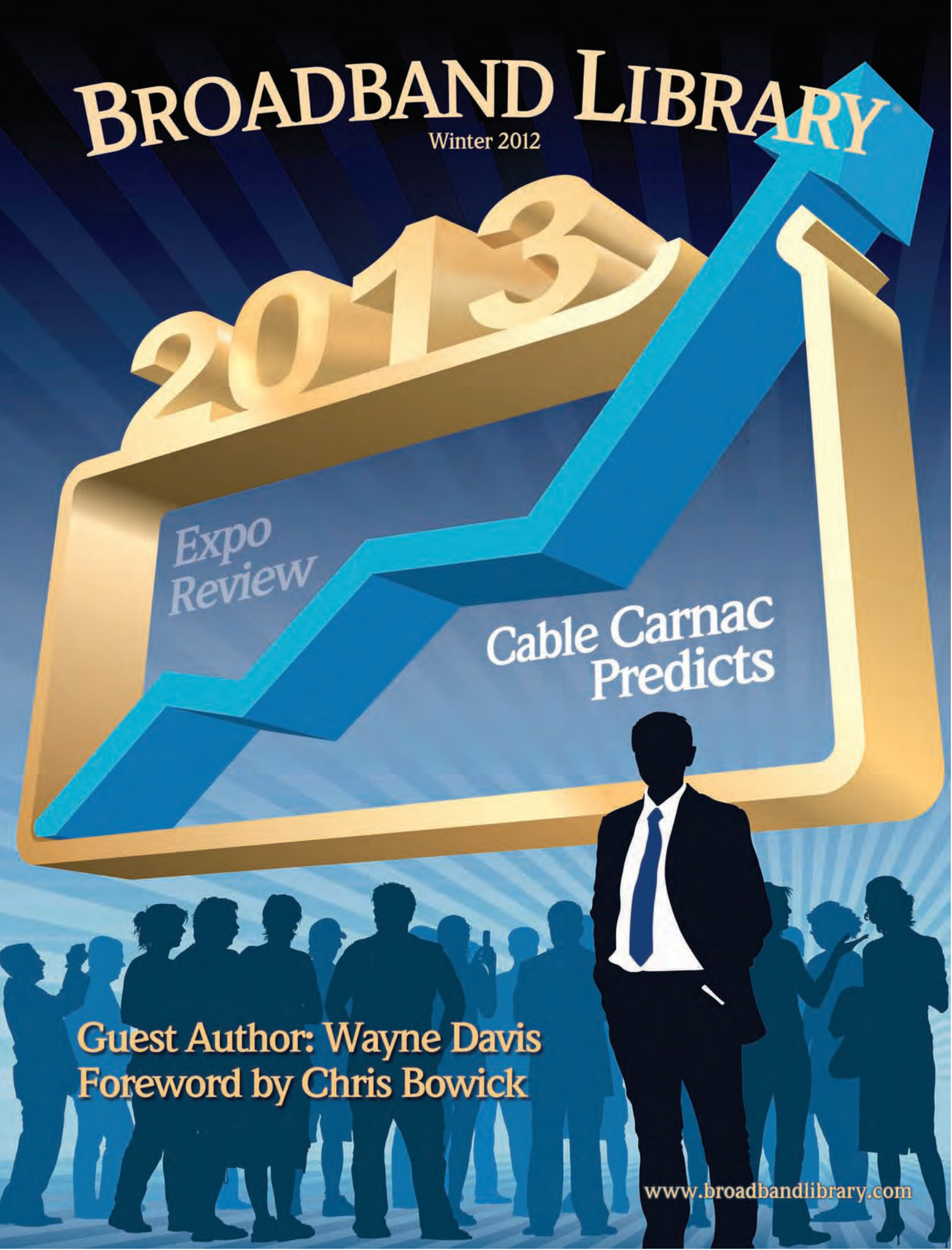
Winter 2012



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Cable Carnac

The Broadband Economy: A Healthy Forecast

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Dr. Rouzbeh Yassini has gained an international reputation as a broadband visionary for inventing the cable modem while founder/CEO of LANcity and for establishing the Data Over Cable Services Specification (DOCSIS) through CableLabs, SCTE and the International Telecommunications Union. As an entrepreneur and investor, Rouzbeh has participated in the progres-

By some estimates, the number of devices connected to cable's broadband networks from a single home will number in the thousands in just a few years. Blu-ray players that speak IP, webcams that watch over the house and even a new breed of intelligent kitchen appliances are yesterday's news. The trend to watch now is toward a sensor-based lifestyle in which a dwelling is converted to its own mini-hospital, university, business office and entertainment hub. Within this mix, the most compelling connection of all involves not a device, but a human being.

I contend the bigger impact, economically and societally, will come from the home *health* network.

Looking out over the broadband horizon I see a full-scale revolution brewing. It involves a new way of thinking about broadband, not just as a conduit for the traditional voice-video-data trio, but as the lifeblood of an enormous forward leap in human health, wellness, education, lifestyle and longevity that ushers forth a new, global information-based economy.

Among the most promising and immediate opportunities is health care. Today in our industry we often talk enthusiastically about the potential for the home *data* network. But I contend the bigger impact, economically and societally, will come from the home *health* network.

Here are just a few examples of work being done by innovators in what I think of as the emerging field of "Broadband Wellness":

• From MIT's Spectroscopy Laboratory: A tattoo made from carbon nanotubes that can provide non-invasive blood glucose measurements via a smartphone camera that measures reflectivity off the tattoo. No more pricking your finger. Fast real-time data.

• Developed by AliveCor of San Francisco: an attachment to an iPhone that can provide clinical-quality electro-cardiogram measurements. Patients can use it to capture and send real time ECG measurements to their care provider.

• A "smart bra" made with integrated heat sensors that can detect early stages of breast cancer by monitoring micro flashes of heat in human body and informing doctors via broadband.

• From EyeNetra of Cambridge, Mass: A smartphone attachment that allows individuals to perform diagnostic eye tests, attain prescriptions and connect to their eye-care provider. Has the potential to significantly drive down the cost of eye care for the average person.

• In development: Cameras linked to phones, tablets, laptops or even future TV sets that record blood pressure. Users could provision a system to measure blood pressure at predefined times of day and to issue alerts if measurements exceed acceptable limits.

• Being tested by the University of Washington and Seattle Children's Hospital: an app that uses a smartphone microphone to measure lung health. Allows those with pulmonary disorders such as asthma to monitor lung functioning at home or on the go.

• In sports, many Olympics athletes now use broadband-connected sensors to monitor calorie intake, body heat, energy consumption and other critical performance metrics in pursuit of a gold medal advantage.

These examples are just the beginning. The pace of innovation is accelerating as risk-takers, investors and entrepreneurs begin to fathom the economic scope of a health care revolution that puts more innovation, more capability and more control in the hands of patients. As we know, broadband has a history of democratizing every sector it touches: Books are more attainable and affordable than ever. Video pours forth from millions of devices on demand. Music no longer is fixed to compilation discs sold exclusively on store shelves. Some of our most revered college professors make lectures available online — for free.

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sion of numerous start-ups from concept to successful exit. He is the author of Planet Broadband, *a humanized look at broadband technology. The NCTA awarded Rouzbeh with a 2004 Vanguard Award, one of the cable industry's highest honors, for his contributions and dedication to the industry. In the spring of 2008, he opened the Yassini Broadband Knowledge Center in Boston, offering research grants and facilities to investigate fresh ideas in broadband technology that will improve the way we work and live. Rouzbeh holds an honorary Ph.D. in science and a B.S. in electrical engineering from West Virginia University, an honorary Ph.D. from Merrimack College, and an equivalent M.B.A. from GE's Financial Management Program.*

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Health care is ripe for a similar disruption, one that has potential to propel tremendous productivity gains in the global health care economy as health care technology migrates from expensive/fixed-location to inexpensive/mobile. This shift toward affordable, easy-to-use monitoring, detection and lifestyle management offers the promise of preventing harmful illnesses and reducing the need for the expensive remedies we now rely on to treat them. I believe it is entirely possible that the policy objectives laws and legislation struggle to accomplish can actually be achieved through inventive applications of technology.

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Standards work

Already, standards bodies have developed specifications for interoperability of medical devices and applications. The ISO/IEEE 11073 Personal Health Devices working group, with input from IETF and the Continua Alliance of companies involved in this area, has established a family of specifications (known as the **104xx series**) that allow information to be "exchanged to and from personal telehealth devices and compute engines" such as smartphones, PCs, personal health appliances and set-top boxes in an interoperable manner, using existing Bluetooth and USB connectivity.

A glance at these standards illustrates the range of potential in the category:

- IEEE 11073-10404 - Pulse Oximeter
- IEEE 11073-10407 - Blood Pressure Monitor
- IEEE 11073-10408 - Thermometer
- IEEE 11073-10415 - Weighing Scale
- IEEE 11073-10417 - Glucose Meter
- IEEE 11073-10420 - Body Composition Analyzer
- IEEE 11073-10421 - Peak flow
- IEEE 11073-10441 - Cardiovascular Fitness and Activity Monitor
- IEEE 11073-10442 - Strength Fitness Equipment
- IEEE 11073-10471 - Independent Living Activity Hub
- IEEE 11073-10472 - Medication Monitor

Additional potential standards addressing respiration monitors and insulin pumps, among other device specifications, are in development now.

Global ecosystem

Health care, though, is just one example of the transformative potential of broadband. With broadband as our toolbox, we can move to a global ecosystem in which each home becomes a business center, university campus, health care facility, energy management center, library, town hall gathering place and innovation corner.

To make it happen, though, we need two things: connectivity and creativity.

On the "connectivity" side, cable-powered broadband networks, and especially in-home broadband wireless networks, are critical enablers for this transformation. In the same way that Henry Ford's brilliance helped to accelerate the industrial revolution, the rising performance capabilities of cable's broadband networks are delivering on the promise of the information age.

But to seize the moment, we need more than powerful networks. We need to become more creative. Broadband service providers must adopt a broader view of what broadband is, and does. Voice, video and data should not be seen purely as end products in their own right, but as tools and bridges that enable and sustain a meaningful advancement in a global economy that has been stuck in neutral for nearly a decade. We have moved beyond the triple play. Instead, we need an infinite play: hundreds of thousands of applications and services, connected to thousands of devices per household, available to billions of people across the world through the power of broadband.

It is a transformation to a true information economy that broadband providers can help to bring about. Our highest potential won't come just from delivering voice, video and data, but from connecting our networks to people in ways that foster improved quality of health, learning, and longevity and an automated lifestyle. That's the promise of broadband. That's where I see our future.