According to Merriam-Webster, the word humanize means, “to represent as human, attribute human qualities to.” It can be used in so many ways... to humanize your brand, company, social media, workplace, e-mail address, pets, or healthcare experience. But the big question is, can healthcare technology be humanized?

**The Road Less Traveled: Humanizing Radiology**

When it comes to radiology, the answer is yes. While many healthcare providers have dedicated themselves to greater compassion in medicine, many providers in the field of radiology have been focused on image quality rather than the human element. But a few years ago, GE Healthcare initiated a quest to change that. The company set out to optimize the patient experience—while continuing to provide superb image quality, and technology with a purpose. “GE Healthcare is taking the less-traveled road of humanizing radiology while continuing our tradition of uncompromised image quality,” comments Jacques Coumans, PhD, General Manager, Premium MR, GE Healthcare. “We’re constantly challenging ourselves, and the entire MR community, to put the patient at the center of everything we do.”

**High touch, high tech**

To truly humanize radiology, Coumans explains that patient-centricity must also work in tandem with a focus on technologists and radiologists. According to Coumans, this caring focus on patients, technologists, and radiologists has not taken away GE Healthcare’s ultimate goal to bring the best possible diagnostic imaging quality to radiologists. For example, the Discovery* MR750w and the Optima* MR450w wide bore systems offer a balance of caring design and insightful technology. They bring together the versatility of 1.5T and the performance of 3.0T, with the care of a wider bore design.

The goal of humanizing radiology is to provide MR technology that touches everyone in the scanning process and

**Digital Dive**

Hear Jacques Coumans, General Manager, Premium MR, GE Healthcare, talk about the patient-friendly design and the advanced technology offered by a premium MRI scanner:

[http://www.youtube.com/watch?v=i6wFBMwZ2wI](http://www.youtube.com/watch?v=i6wFBMwZ2wI)
helps make their lives better. For example, the patient receives a more comfortable scanning experience; the technologist experiences ease of use, speed, and simplicity; the radiologist can count on superb image quality, as well as advanced procedures, exams, and protocols; and the administrator realizes economic sustainability.

Over the last five years, GE Healthcare has introduced technology with a caring purpose—from 10 new systems to innovative new applications—all aimed to create more personal and more satisfying experiences for all involved in the scanning process. See the sidebar directly following this story for a recap of the company’s innovation highlights.

Caring design, insightful technology

Among GE Healthcare’s many strides in humanizing radiology is the company’s introduction of its new wide bore systems. Using the symbol of caring hands as inspiration, the systems were designed to be soothing and welcoming to the patient, and intuitive and user friendly for the technologist. “Our vision is that MR exams should be a safe and comfortable experience for everyone,” comments Coumans. “We aspire to a design that makes our MR systems preferred by patients and technologists, without compromise.”

Some might question if system aesthetics can really make a difference. According to Jim Davis, Vice President and General Manager of GE Healthcare, it does. “An uncomfortable, moving patient can sometimes lead to poor image quality and time-consuming re-scans,” states Davis. “A soothing experience for patients could translate into a more positive outcome for radiologists, including better image quality. Technologists can now focus their attention more on where it matters most—on the patient.”

For more information about the caring design, visit www.gesignapulse.com/signapulse/spring2011#pg44.

Shining stars

A view of GE’s quest to humanize radiology wouldn’t be complete without a look back at the company’s key collaborations and advancements in MR. These key developments have all contributed to optimizing the human element in radiology.

“Strong collaborations push us to advance the MR industry,” explains Davis. “We salute those who apply their uncompromising vision to advancing and humanizing MR. Just as their work revolutionizes science today, so will it touch lives tomorrow.”

Key collaborations have been an integral part of cutting-edge innovations from GE Healthcare. These have aided the company in bringing many products to market that have improved patient-centricity in MR, such as:

3D ASL—David Alsop, PhD, Beth Israel Deaconess Medical Center. Advanced NCE technique for quantifying blood perfusion in the brain that is 3D FSE based and uses pulsed continuous (aka pseudo continuous) arterial spin labeling method.

IDEAL IQ—Scott B. Reeder, MD, PhD, University of Wisconsin. IDEAL IQ is a promising MR-based technique that provides volumetric whole-liver coverage in a single breath-hold and generates estimated T2* and fat fraction maps in a non-invasive manner. To review clinical cases that demonstrate the potential clinical utility of IDEAL IQ including examples of its role in diagnosis and therapy monitoring, and how it could be used in conjunction with the MR Touch application for assessment of diffuse liver disease, visit www.gesignapulse.com/signapulse/spring2011#pg75

PROPELLER—Jim Pipe, PhD, Barrows Neurological Institute. The first commercial MR method to eliminate blurring in a scan due to patient movement—a method now available on most commercial scanners.

New heights

Using the past as a guide and incorporating many existing MR innovations, GE Healthcare continues to work with its research collaborators to bring more products to market that will elevate radiology’s human element further. This year, GE Healthcare is

“Strong collaborations push us to advance the MR industry. We salute those who apply their uncompromising vision to advancing and humanizing MR. Just as their work revolutionizes science today, so will it touch lives tomorrow.”

Jim Davis, Vice President and General Manager, GE Healthcare
introducing several new innovations that will benefit the patient, technologist, radiologist, and administrator.

**GEM-enabled workflow**—With the redesign of the Optima MR450w, and the addition of the Geometry Embracing Method (GEM) Suite, GE Healthcare has committed to a focus on the human element. In that vein, GEM-enabled workflow gives equal priority to patient, technologist, and radiologist needs. For more information, see pages 60–63.

**MultiDrive RF Transmit**—The leap in image quality from 1.5T to 3.0T is unquestionable, yet as MR technology improves, new challenges continue to present themselves. For example, shading artifacts are more challenging at 3.0T than 1.5T, particularly with abdominal scans. Wide bore MR systems further complicate this issue, since at 70 cm the space between the RF coil and RF shield diminishes, requiring more precise control over the RF transmit system. To help solve this issue and unleash the power of 3.0T on the Discovery MR750w, GE Healthcare introduces the MultiDrive RF system, an independent RF pulse control, and a new whole-body, 4-port drive RF coil design. Together, these innovations improve signal uniformity across the FOV regardless of patient size. For more information, see pages 66–67.

**MR Experience**—GE Healthcare’s MR business collaborated with PDC Facilities to provide the MR Experience™ in a PDC Experience Cassette™—a relocatable diagnostic imaging suite, expressly designed to house a GE MR system. The MR Experience gives patients a unique degree of control over their environment, helping reduce the anxiety often associated with an MR exam to help minimize patient movement and decrease retakes.

The heart of the MR Experience gives patients a real voice in their diagnostic surroundings by enabling them to instantaneously change the scan room environment. One touch on a tablet changes the video screen over the exam table, as well as the LED room lighting to the patient’s choice from a variety of different color schemes. Along with familiar photos or videos on the overhead screen, the colored lights warm the room in soft tones, making the environment less intimidating. For more information, see pages 72–74.

Will there be greater advancements in humanizing radiology in the future? According to Coumans, where GE Healthcare has been drives where the company is going—and there’s still a lot left to do in the effort to humanize radiology. “Our new, caring direction, combined with uncompromised technology and image quality, should influence the next generation of products for years to come,” he offers.

**More to come**

And will GE Healthcare stop there? Davis is confident there are more technology advances to come, such as metabolic imaging with hyperpolarized Carbon 13(C13). GE Healthcare recently announced that it is dedicating $1 billion of its total R&D budget over the next five years to expand its advanced cancer diagnostic and molecular imaging capabilities, as well as its world-class technologies for the manufacture of biopharmaceuticals and cancer research. The company is a leader in diagnostic imaging for the detection of cancer and is a leading provider of technologies for cancer research and biopharmaceutical manufacturing.

In MR, this reinforces our focus on the development of technologies such as metabolic imaging with hyperpolarized C13 for research and biopharm manufacturing activities. For more information, see pages 64–65.

“None of us can move the needle in MRI alone... it takes a team bigger than any of us as individuals to come together and make smart decisions to push the boundaries of MR,” says Davis. GE Healthcare intends to continue its quest when it comes to humanizing radiology.

‡‡ CAUTION: Sterile compounding equipment. Output of this equipment may only be used for human applications under an approved research study (IND or equivalent).

Acknowledgement:
The editor sincerely acknowledges the direction and input of Jason Polzin, PhD, Chief Engineer, MR Software and Applications, GE Healthcare, Global, in crafting this article.
Over the last five years, MR has been seen in a new light, thanks to these GE innovations that are patient-conscious, offering a caring focus and design.

Advances in MR imaging, including 3.0T SAR management, new approaches in cardiac imaging, applications designed to help improve breast diagnosis, and solutions for producing high-resolution MR images despite patient movement.

The introduction of the Signa* HD product family and a comprehensive breadth of powerful clinical applications: PROPELLER HD for high-quality brain imaging overcoming motion artifacts; MR Echo for real-time heart imaging without breath holding or ECG gating; VIBRANT for bilateral breast imaging in a single exam; TRICKS for MR angiography of the legs; and LAVA for making outstanding abdominal MR imaging easier.

The unveiling of MR-guided focused ultrasound from InSightec®, on the GE Signa* HDxt 1.5T, enabling non-invasive MR-guided treatment of uterine fibroids with thermal ablation.

Breast MR technology, including VIBRANT and VIBRANT-XV; BREASE—an easy-to-use, breast-specific, single-voxel spectroscopy tool for lesion characterization and assessment of early treatment response; and the HD 8-channel Breast Array—exceptional SNR for high image resolution and excellent access for intervention.

The next dimension in HD MR imaging, the Signa HDxt, and innovative applications that radiologists could put to immediate use on the new system:

- IDEAL—consistent, exceptional fat suppression for even the most challenging anatomies, addressing the problem with metal and chemical shift artifacts;
- Cube—the 3D, HD acquisition that allows viewing in any plane, eliminating operator variances and minimizing blurring to acquire complete data from scan—all while significantly reducing total exam time by at least one-third;
- LAVA Flex—abdominal imaging with four contrasts in one breath-hold, in-phase, out-phase, fat, and water images;
- ARC—a major step forward in speed and accuracy, delivers a highly accelerated parallel imaging technique, enabling tight FOV prescriptions; and
- BrainSTAT—provides an effective way to visualize the effects of neurological conditions, providing valuable treatment information quickly.

The Discovery* MR750, a powerful 3.0T system offering greater coverage, higher resolution and significant improvement in uniformity and accelerated acquisition and reconstruction speed, a reduction of set-up time up to 70% over fixed-table designs, plus a high-resolution in-room display (compared to previous systems).

Exceptional clinical images were released from the Discovery MR750, Discovery* MR450, MR Touch, and Signa* HDe—the first “green” ecomagination product. Plus, more options for non-contrast imaging were added, such as the Inhance Applications Suite, and the company introduced SWAN—a fast, easy, multi-echo acquisition technique to help clinicians diagnose patients with ischemic and cerebral disease.

The introduction of the Optima MR450w wide bore system, which overcome a 40% loss in efficiency resulting from moving from 60 cm to a 70 cm diameter patient bore while maintaining excellent image quality.

The announcement of MR Touch—an important diagnostic test in assessing patients with suspected liver disease to detect the presence of hepatic fibrosis, which can often be treated if diagnosed early enough before it progresses to irreversible cirrhosis. This innovation arose from the company’s collaboration with Dr. Richard Ehman at Mayo Clinic.

The company expanded into the extremity-specific arena by purchasing certain assets of ONI Medical Systems. The Optima* MR430s, based on technology and comfort offered on the ONI MSK Extreme 1.5T, was then unveiled.

Two new systems were introduced—both using the same proven magnet as the Discovery MR450. Designed for customers needing strong performance, versatility, and outstanding value without compromise, the Optima* MR360 delivers a broad range of advanced software applications, new RF technology enhancements, workflow automation features, and low overall cost of ownership. The comprehensive, affordable, and intuitive Brivo* MR355 was intended for the first-time MR institution—aiming to bring high-field MR within reach to a vast array of hospitals.

GE Healthcare received FDA clearance of READY View, a new MR advanced visualization platform to help clinicians process and analyze images anytime and anywhere.

The introduction of the Geometry Embracing Method (GEM) Suite of Flex coils, used in imaging all joints—replacing the hard, plastic coils with embracing, flexible ones—and offering a way to more comfortably image any joint.