

# PHILIPS

## 2014 North American Positron Emission Tomography (PET) Imaging Technology Innovation Leadership Award



F R O S T & S U L L I V A N



50 Years of Growth, Innovation & Leadership

## *Industry Challenges*

The last year marks a revival of technology and product innovation in the field of positron emission tomography (PET) imaging. Indeed, during 2013 and the beginning of 2014, each of the three major PET imaging equipment manufacturers introduced a new-generation PET imaging system as their new premium offering. Recent industry innovation efforts in PET imaging have centered mainly on two aspects of the modality, seeking to improve, on one hand, the image quality of PET images, and, on the other hand, the quantitative accuracy of PET image measurements.

Enhancing the quality of PET images, e.g., by means of a higher signal-to-noise ratio, and improving PET imaging's quantification capabilities, e.g. by improving the measurement accuracy of standardized uptake values (SUV) means, have been universally recognized as the two most important potential areas of improvement for state-of-the-art PET imaging. Collectively, these improvements can serve well the clinical case for PET, by yielding a higher reproducibility of PET-based measurements and a higher reliability of PET study results, which is essential for a modality that is used throughout the various stages of the oncology continuum of care.

However, being a specialized and costly modality, PET imaging is subject to very different clinical utilization patterns and clinical requirements, than those characteristic of the frontline modalities used in the early stages of clinical care pathways. Given the comparatively low procedure volumes of PET imaging – estimated at just over 2.0 million PET procedures in 2014 – and their high procedure length and cost, it is absolutely critical, in order for the modality to remain clinically and financially viable, that it delivers the most definitive and actionable diagnosis possible.

In addition, to further solidify the viability of capital PET system investments, the improved diagnostic value in PET imaging must extend beyond oncology – PET imaging's traditional stronghold – to have a positive impact on cardiology and neurology procedures as well. Although smaller in terms of adoption and procedure volumes, these two areas of clinical application for PET imaging are promising, and growing.

As these multiple challenges continue to mount, they are preventing PET imaging from reaching its full potential and becoming a modality of high clinical value that is also cost-effective for the healthcare enterprise. As such, PET has been ripe for a breakthrough technology upgrade that effectively boosts its value proposition and performance, such as the definitive leap forward from analog to fully-digital PET imaging technology, driven by Philips Healthcare.

## *Technology Excellence and Visionary Innovation of Philips Healthcare*

### **Commitment to Innovation:**

Philips Healthcare's Vereos digital PET/CT system is the product of more than six years of intense research and development efforts conducted in-house by Philips, which, in 2006, set out to create the industry's first digital PET/CT.

At the core of Philips' Vereos digital PET/CT system is the novel silicon photomultiplier detectors, which overcome the limitations of avalanche photodiodes (e.g. heating and vibrations) to provide a definitive replacement option for traditional analog detectors. The Vereos' all-digital imaging chain was re-designed from the ground-up, forming a brand new digital system that enables the next level of performance in PET imaging.

### **Application Diversity**

A few years after its pioneering efforts in developing time-of-flight (TOF) photon counting technology, which drove the last growth cycle in the PET imaging systems market, Philips is now spearheading the next growth wave for the PET market.

Assessing the last few years' PET imaging market, it can be said that TOF technology brought significant enhancements to oncology PET imaging, but only marginal improvements to cardiology and neurology PET imaging. However, while oncology PET still holds considerable untapped potential, the two areas of cardiology and neurology PET are expected to be more dynamic growth drivers for the PET imaging market in the next few years. Indeed, clinical advances and new radiopharmaceuticals are set to accelerate adoption and increase procedure volume in these two areas.

### **Unmet Needs:**

Philips Healthcare's Vereos PET/CT addresses the major shortcomings of PET imaging, which, in the previous state of the art, clearly had room for improvement in image quality, in quantification accuracy and reproducibility, and in procedure workflow efficiency.

Through a combination of hardware and software advances, including yet another major boost to TOF imaging speed, the Vereos PET/CT yields considerable sensitivity and volumetric resolution gains, thereby opening the way to a whole new level of image quality, performance, reliability and diagnostic confidence in PET imaging.

In fact, the high level of anticipation in the radiology and molecular imaging community surrounding the launch of the first digital PET system, is testament to the market's appetite for the next major innovation PET imaging represented by Philips' Vereos PET/CT system.

### **Use of Mega Trends:**

With the rise of value-based healthcare and the advent of value-based imaging, the clinical value and patient outcomes generated by advanced and expensive imaging procedures are being all the more scrutinized by health systems and payers.

Therefore, it is more important than ever today for imaging providers vested in molecular imaging to be able to demonstrate to their enterprise customers that PET imaging is a modality of choice for deriving definitive diagnoses and treatment plans for patients.

It is only through such an upgraded value proposition on the clinical side that PET imaging can start to represent a cost saving opportunity as part of bundled payment initiatives, and thereby act as a true value driver for the broader healthcare enterprise.

**Blue Ocean Strategy:**

As is customary for new-generation technologies, digital PET imaging is seeing its early adoption phase stem from academic and research centers of excellence, which are typically seeking new and better tools that will improve the quality of their clinical research.

In addition, given the workflow, performance and reliability improvements of digital PET imaging, facilities looking to enhance their competitive positioning in diagnostic imaging in general and in each specialty area in particular, are now closely evaluating Philips' technology to be the next great addition to their imaging arsenal.

Yet, perhaps the most encouraging sign in the adoption curve of digital PET imaging, is the fact the modality is proving to be appealing to the value-based segments of the market as well. Indeed, with the new value-based purchasing mechanisms being implemented, even the more cost-constrained customers are now more likely to see the overall value generation potential and long-term returns on investment of digital PET imaging, outweigh the initial investment costs in the decision-making process.

**Aspirational Ideals:**

To be the first vendor to introduce a major new technology innovation in any given market has its advantages, but it holds intrinsic risk as well. Philips Healthcare took on this challenge several years ago with digital PET and is now seeing its efforts come to fruition despite particularly difficult years for technology innovation and market growth, particularly in advanced medical imaging.

Now equipped with the first digital PET in the industry, Philips is extremely well positioned today to be the first to benefit from this new growth opportunity.

However, the importance of digital PET technology goes well beyond the technology, competitive and business excellence it demonstrates of Philips Healthcare. In fact, it is this type of powerful and meaningful new technology that is needed in the imaging industry in order to bring diagnostic imaging back to the forefront of the healthcare value chain.

**Conclusion**

With the design and launch of its Vereos PET/CT system, Philips Healthcare is effectively helping to push the boundaries of PET imaging to the next level. This breakthrough innovation is set to enable providers to reach the next frontier in the clinical utility of PET imaging, while setting the stage for wider-scale utilization of this high-potential modality. Philips Healthcare is also acting to push the medical imaging industry forward.

Given the multi-faceted enhancements brought by the Vereos PET/CT system spanning all of its clinical, operational, and financial aspects, this innovation from Philips is a clear

demonstration that value-based healthcare still holds a place for cutting-edge capital imaging equipment, so long as it can truly boost patient care and drive overall value to the healthcare system. Frost & Sullivan is proud to present Philips Healthcare with the 2014 North American Technology Innovation Leadership Award in Positron Emission Tomography to Philips Healthcare.

## Significance of Technology Innovation Leadership

Ultimately, growth in any organization depends upon finding new ways to excite the market, and upon maintaining a long-term commitment to innovation. At its core, Technology Innovation Leadership is therefore about three key things: understanding demand, nurturing the brand, differentiating from the competition. This three-fold approach to delivering Technology Innovation Leadership is explored further below.

