

# Collecting Patient Data at the Point-of-Care...

*Weighing the pros and cons of consumer devices in the medical environment*

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JADAK White Paper

Hospitals are under more pressure than ever to accurately track and secure patient data. It's no surprise that the use and advancement of mobile technology in the medical workplace is increasing rapidly. There's little debate over technology's positive impact on the healthcare system and its potential, especially as it relates to the improvement of patient safety. A notable trend in the industry is the convergence of consumer-grade products and technologies with the clinical environment. The use of commercial-grade tablets and smartphones by medical professional's is becoming more popular by the day and is causing plenty of debate on whether consumer-based or purpose-built devices are the better option. Consumer-based devices such as the iPhone and iPad are perfect for day-to-day personal use by the general population. They're easy to use and chock full of features intended to streamline anyone's daily tasks. Purpose-built devices are designed for specific jobs and applications. Both options have their advantages and disadvantages; therefore, it's important to weigh the pros and cons of both in order to choose a device that will best fit your medical application and environment.

So, what are the important factors to consider when choosing the right platform for your medical application? There are several areas to explore but for the purposes of this article we'll focus on a few of the key topics hospitals consider when implementing data collection devices and technologies.

## Device Performance

Consumer-based devices and purpose-built devices are battling for the top spot in two very common applications in healthcare today: Collecting patient information at the point of care and accessing patient data in a hospitals back-end system such as an EMR or EHR. Typically, data is manually keyed in to an application on the device by a clinician or it can be scanned in via barcode. Barcode scanning is a critical function in the medical field, as it is the primary means for verifying patient ID, ensuring patient 5 rights, tracking specimens or surgical tools, and many other tasks. Barcodes are found on nurses badges, medications, surgical instruments, and on wristbands worn by patients. Commercial devices like iPhone and iPad utilize third party decoding software that enable reading of standard 1D and 2D barcodes. Perfectly acceptable for non-mission critical scanning, however they're simply not optimized to read the wide-variety of codes found in the medical environment. In fact, non-optimized solutions have been found in some cases to



Most of today's smartphones can scan barcodes, but lack the dedicated technology to do it as quickly and accurately as a purpose-built scanning device.

have as high as a 10% error rate. Third party software also lacks the decoding power to handle poor quality codes which are a reality in the medical environment.



The flexpoint HS-2M Bluetooth Point-of-Care Barcode Scanner

These errors can have very serious, even life threatening consequences, not to mention its impact on user productivity.

In contrast, purpose-built solutions are equipped with integrated scanning engines that are specifically optimized for each application's requirements. Today's barcode scanning engines offer a broad spectrum of capabilities that range from high performance barcode reading to more sophisticated functions such as machine vision/image analysis and RFID. At their core, purpose-built scanners input data with speed and a

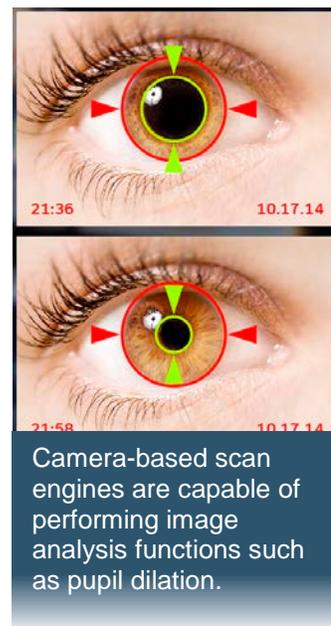
high degree of accuracy that simply cannot be matched by their commercial counterparts. Scan engines with two-dimensional (2D) reading capabilities will read virtually all barcode symbologies and offer superior decoding ability on poorly printed or damaged barcodes. Camera based scan engines can even be programmed to perform complex image analysis functions such as wound measurement, fluid measurement, and pupil dilation to name a few.

## Total Cost of Ownership

Cost reductions are top of mind for all healthcare organizations. Consumer-based devices are often associated with lower start-up costs, which make them an attractive technology option, initially. Whether a hospital is rolling out consumer devices or they have a 'BYOD' (Bring Your Own Device) policy, often times start-up costs are lower than that of a purpose-built implementation. The truth however is purpose-built devices have a much lower total cost of ownership over the life of the product - The single biggest contributing factor being that consumer-grade products are not built to withstand the rigors of the hospital environment.



VDC Research Group found that consumer devices are three times more likely to fail in the first year. The average first year failure rate for rugged or more purpose-built devices is 7 percent, compared with the 23 percent for consumer devices. Failure rates with consumer products have actually been known to be as high as 50 percent in some cases<sup>(1)</sup>.



Camera-based scan engines are capable of performing image analysis functions such as pupil dilation.

The root cause of 77 percent of those failures is a dropped device. Hospitals are fast-paced, harsh environments and generally consumer products are fragile and unable to handle multiple drops to hard hospital floors. The costs associated with device repair, loss in productivity and overall downtime of the device can be significant.

What's more, consumer device lifecycles are inherently shorter. Most devices are designed for no longer than 1-2 years of use, not to mention the frequent firmware updates and fixes released every few weeks across multiple operating systems. This results in a tremendous strain on IT departments and often ends up being a very costly infrastructure to maintain effectively. Conversely, purpose-built devices virtually eliminate these challenges. Generally, enterprise devices exist in a given environment for 5-7 years or longer with support from the original equipment manufacturer for the life of the product. In this scenario, all devices run on the same operating system with synchronized firmware or software updates, simplifying IT's job and making it a more predictable infrastructure to manage.

The flexpoint HS-1M and flexpoint HS-2M Bluetooth model are built to endure the rigors of the hospital environment.



## Medical-Grade Plastics

The conditions in a healthcare environment are much different than that of a standard office atmosphere. Medical instruments and devices require constant disinfecting to prevent the spread of deadly infections from patient-to-patient. In the United States, the Centers for Disease Control and Prevention estimated roughly 1.7 million hospital-associated infections, from all types of microorganisms, including bacteria, combined, cause or contribute to 99,000 deaths each year<sup>(2)</sup>. Extremely harsh cleansing agents are used multiple times a day to sterilize medical equipment and instrumentation. Purpose-built products are often designed with medical-grade plastics, meaning their housings are void of microscopic pores that would allow chemicals to seep in and ultimately degrade the integrity of the unit. Most importantly, medical-grade plastics allow disinfectants to kill infectious bacteria on contact.

Consumer-based devices are not held to the same standards. After frequent cleanings, overtime, these chemicals will degrade device housings making them more susceptible to damage. Worse yet, many organizations allow staff to bring their own devices which increases the potential for infectious bacteria to travel outside of the hospital.

## Security

Data breaches are an all-too-frequent headline in the news today. The highest profile stories are usually associated with large retail companies being hacked or accidentally leaking customer credit card information into the wrong hands. Unfortunately, the healthcare industry is no stranger to data breaches, so security for patient Protected Health Information or "PHI" security remains a primary concern. In fact, HIPAA data breaches have climbed 138 percent since 2012 with more than 7 million patient records compromised in 2013 alone<sup>(3)</sup>. So, what has caused this sharp increase? The reasons vary, but it is well known that "Bring Your Own Device" policies are a risky proposition.



Not unlike most of us, practitioners tend to be passionate about their mobile devices. No one would argue that today's top mobile phone companies know a thing or two about making products that are incredibly intuitive and provide a world-class user experience. There are clear benefits for having a device that a clinician is comfortable with when seconds matter. A recent Cisco study finds that 90 percent of Americans employed in the healthcare industry use their personal devices for work <sup>(4)</sup>. The same study also states that 40 percent of those mobile devices were not password protected. Unsecured patient information is often stored on the device itself, but the device can be used to access their organizations EMR system over public networks. Historically, these data breaches have occurred when personal phones and tablets have been lost or stolen.

Today, purpose-built data collection solutions are a hospital's best option for mitigating security risks. Generally, these devices are not taken outside of the hospital and are required to work only within the confines of the building. Beyond that, enterprise-level data collection devices may be equipped with any number of security-based features such as encryption technology, remote lock or wipe features, restricted access, or IT control over downloading and updates.

<b>Comparison Chart</b>		
	<i>Purpose-Built</i>	<i>Consumer-Grade</i>
<i>Durability</i>	✓	
<i>Medical-grade plastics</i>	✓	
<i>Lower Total Cost of Ownership</i>	✓	
<i>Security</i>	✓	
<i>Lower start-up costs</i>		✓
<i>Familiarity</i>		✓

In closing, it is extremely important to weigh the pros and cons of both consumer-based and purpose-built devices when considering which handheld data collection product to deploy to hospital staff. Consumer-based devices can be appealing because of their low start-up costs and user familiarity. Hospitals have to weigh these benefits against purpose-built solutions that offer a much lower total cost of ownership, inherently more secure, and

are built specifically to withstand the rigors of the hospital environment.

1. Krebs, David, "Mobile Device TCO Models for Line of Business Solutions, Volume 1|Track 7: Enterprise Mobility Mobile Device TCO," VDC Research, April 2013
2. Pollack, Andrew, "Rising Threat of Infections Unfazed by Antibiotics," New York Times, Feb. 27, 2010
3. Breach Report by healthcare IT security firm Redspin, Feb. 2013
4. Cisco mConsigner Study "BYOD Insights 2013: A Cisco Partner Network Study," March, 2013



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