SCANDIT

Total Cost of Ownership of Mobile Barcode Scanning

A Comparison of Legacy and Smartphone-Based Scanning Hardware

Imagine you're a manager who needs to purchase barcode scanners for hundreds, or even thousands of employees. Which devices should you purchase? Should you choose a dedicated barcode scanner, traditional mobile computer, or are smartphones a reliable and cost effective alternative?

As more and more enterprises begin to embrace mobile technology, it's important to keep total cost of ownership in mind. Busy IT leaders can choose between a wide variety of device options on the market today, making it increasingly difficult to determine which ones will deliver the performance you need at a price point that works with their spending budget.
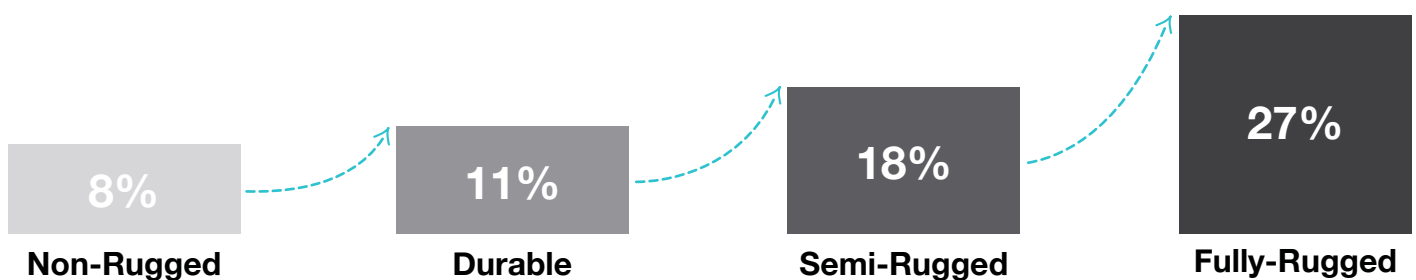
To help ease the decision making, we developed a comparison of the cost and feature differences between popular barcode scanning devices that highlights one of the most important metrics for decision makers: total cost of ownership (TCO).

Calculating device total cost of ownership (TCO)

The following TCO calculations assume that a rugged smartphone that meets the same durability standards is the equivalent of a ruggedized PDA or mobile computer. With this assumption, TCO has been established by referencing Exhibits 2 & 4 from the "TCO Models for Mobile Computing and Communications Platforms" study conducted by VDC Research.

Mobile hardware cost as a percent of TCO

8%	11%	18%	27%
Non-Rugged	**Durable**	**Semi-Rugged**	**Fully-Rugged**

Comparing lifetime total cost of ownership (TCO)

Our comparison found that the TCO of the Motorola MC3190 mobile computer is 512% more than that of a Kyocera Brigadier industrial smartphone running Scandit, and 280% more than a ruggedized, encased iPhone 6 running Scandit. Additionally, we found that the TCO of the Honeywell Dolphin 70e industrial smartphone is 287% more than that of a Kyocera Brigadier rugged smartphone running Scandit, and 157% more than that of a ruggedized, encased iPhone 6 running Scandit.

	Kyocera Brigadier	**Honeywell Dolphin 70e**	**Motorola MC3190**
Lifetime TCO	~1478 USD [1]	~4244 USD [1]	~7578 USD [1]
Device Cost	~399 USD [3]	~765 USD [2]	~1364 USD [2]
Description	Rugged Smartphone	Industrial Smartphone	Rugged Mobile Computer
Scanner Type	Scandit	Dedicated Imager	Dedicated Imager
Internet Capable	●	●	●
Battery Life (talk time)	20 hrs	6 hrs	Unknown
Storage Capacity	16GB (before SD card)	1GB (before SD card)	1GB
Durability	IP68 - Fully-Rugged	IP54 - Semi-Rugged	IP54 - Semi-Rugged

TCO Comparison (Five year and annual for PDA/handheld computers)

	FULLY RUGGED PDA/HANDHELD		SEMI-RUGGED PDA/HANDHELD		DURABLE PDA/HANDHELD		CONSUMER GRADE PDA/HANDHELD	
	Five Year COSTS	Annualized COSTS	Five Year COSTS	Annualized COSTS	Five Year COSTS	Annualized COSTS	Five Year COSTS	Annualized COSTS
Hard Costs - Deployment Costs *Total Hard Costs*	$4,475.0	$895.0	$4,317.2	$863.4	$3,270.7	$654.1	$2,358.8	$471.8
Soft Costs - Operational Costs *Total Hard Costs*	$8,482.4	$1,696.5	$10,026.4	$2,005.3	$16,544.0	$3,308.8	$18,789.9	$3,758.0
Total Cost of Ownership	**$12,957.4**	**$2,591.5**	**$14,343.6**	**$2,868.7**	**$19,814.7**	**$3,962.9**	**$21,148.5**	**$4,229.7**

* Assuming a 4-year r eplacement for fully and semi-rugged notebooks and a 2.5 year r eplacement for durable and consume r-grade notebooks

** Normalized Acr oss all computer platforms

Why our numbers are conservative — hard and soft costs

Total Cost of Ownership (TCO) is calculated by assessing two categories of costs over a four year period: hard costs and soft costs. Hard costs involve the device itself, the software that runs on it and associated software development costs; while soft costs involve the training, operation and downtime costs.

We suspect that both our hard costs and soft costs are overstated for iOS and Android-based smartphones. The hard costs of these devices may be overstated because the VDC study we used for our calculations was developed in the era of Windows CE. Many traditional mobile computer devices operate on Windows CE or Windows Mobile, which have higher associated development costs due to the difficulty of programming and the likelihood of bugs. Another consideration that could impact costs is that not all employees necessarily need dedicated scanning devices, and apps that leverage a smartphone's camera can be extended to personal devices via BYOD policies. Soft costs such as training are likely overstated for iOS and Android-based smartphones due to the familiarity of the devices to users and consumer technology trends.
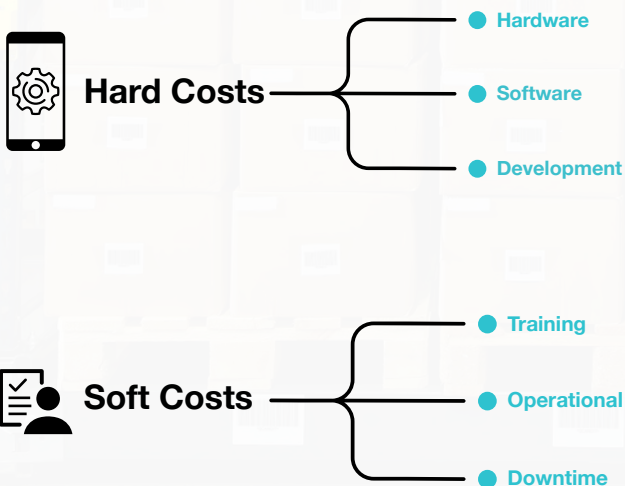
Hard Costs
- Hardware
- Software
- Development

Soft Costs
- Training
- Operational
- Downtime

Why rugged smartphones?

Rugged smartphones offer businesses greater overall functionality to meet IT needs. Dedicated, purpose-built devices are designed to solve a single business problem. Smartphones—unlike dedicated hardware—provide employees with access to telephone, GPS, email and enterprise mobile apps that make them many times more valuable in the workplace. Why purchase multiple devices when you can accomplish all tasks on a single, more cost-effective device?

Choosing a rugged smartphone

There are many options to consider when deciding upon a rugged smartphone. First you must decide whether you'd like to purchase a rugged smartphone or a rugged case for a consumer smartphone. Rugged smartphones tend to be designed with the enterprise in mind, while rugged cases provide the means to protect consumer smartphones.

Rugged Rating	Definition
IP58	Protected from limited dust ingress. Protected from long term water immersion (1m) up to a specified pressure.
IP67	Protected from total dust ingress. Protected from immersion between 15 centimeters and 1 meter in depth.
IP68	Protected from total dust ingress. Protected from long term immersion (1m) up to a specified pressure.
IP69	Protected from total dust ingress. Protected from steam-jet cleaning.

Breaking down the cost of mobile computers vs. rugged smartphones

5× Mobile computers can cost over 5x as much as a rugged smartphone over the device's lifetime.

Rugged smartphones produced by traditional barcode scanning hardware manufacturers cost almost 3x as much as alternatives over the lifetime of the device.

Even a relatively expensive and fully featured device like the iPhone 6 (IP68 rugged case) is cheaper than alternative rugged smartphones produced by traditional barcode scanning hardware manufacturers.

But can smartphones actually scan barcodes reliably?

Enterprise-Grade Scanning

Scandit's enterprise-grade, camera-based barcode scanning has been a reliable alternative to laser scanning for several years now, and it's continuously improving.

Mobile Functionality

Even traditional manufacturers of barcode scanners have introduced a new class of smartphone devices designed with increased mobile functionality.

Equivalent Performance, Lower Cost

Legacy hardware providers are relying on the trust they've built through strong market positions as well as the high cost of dedicated scanning solutions to demand higher prices than comparable solutions.

Are rugged smartphones a reliable alternative to dedicated devices?

Improving All the Time

Some business decision makers have raised concerns about the reliability of consumer smartphones as an alternative to dedicated scanners. These concerns don't take into consideration the dramatic improvements to fully-ruggedized smartphones and encasement options now available.

Enterprise-Ready Ruggedness

Today's rugged smartphones are being designed with the enterprise in mind and present the same rugged options at a fraction of the cost of dedicated scanners, when paired with Scandit software that does not require an additional sled or barcode scanning imager component.

More Functionality, Low TCO

Dedicated barcode scanner manufacturers often overestimate the soft costs of rugged smartphones in comparisons. These comparisons exaggerate unnecessary soft costs not required when you leverage high quality built-in smartphone cameras for scanning barcodes.

How today's enterprises benefit from mobile barcode scanning

AMERICAN WOODMARK
CORPORATION

Industry: Manufacturing
Use Case: Asset Tracking

American Woodmark needed an effective method for employees to quickly identify and report product quality issues from the field. With the ubiquity of mobile devices, they settled on the development of FieldTrac, a cross-platform mobile app that would enable employees to identify products rapidly and report quality assurance details in a short amount of time. Today, FieldTrac allows employees to scan and identify products quickly, while remaining easy to use across multiple platforms.

Winterhalter Fenner AG

Industry: Wholesale Distribution
Use Case: Order Entry

Winterhalter + Fenner introduced a handy tool for manufacturers to order electronic supplies. With the integration of the Scandit Barcode Scanner SDK in the Winterhalter + Fenner app, customers can conveniently scan product barcodes to assemble orders. It's no longer necessary to type in a product name or search through product categories to place orders— scanning the barcode is enough. The tool saves time for clients and closes a gap within the procurement process for electronic goods. The results: an accelerated procurement process where customers can browse products, review important product information and assemble orders by scanning a barcode.

The conclusion: smartphones offer equivalent scanning performance at a fraction of the cost of dedicated barcode scanners

Smartphone-based barcode scanners can be significantly more cost-effective than traditional alternatives, while providing access to a broader range of functionality. It appears that while smartphones produced by traditional barcode scanner hardware manufacturers are an attempt to evolve from their traditional product offerings, the hardware is underwhelming and is currently sold at non-competitive price points.

The dramatic price gap between the systems offered by traditional scanner hardware manufacturers versus the systems that leverage Scandit's agile smartphone-based barcode scanning software represents the power software has to reshape traditional markets. As they would say in Silicon Valley both mobile and software are eating the world.

> *The appeal of consumer devices lies not only in their lower upfront adoption cost but also the significantly superior user experiences delivered on these devices and improved industrial design.*
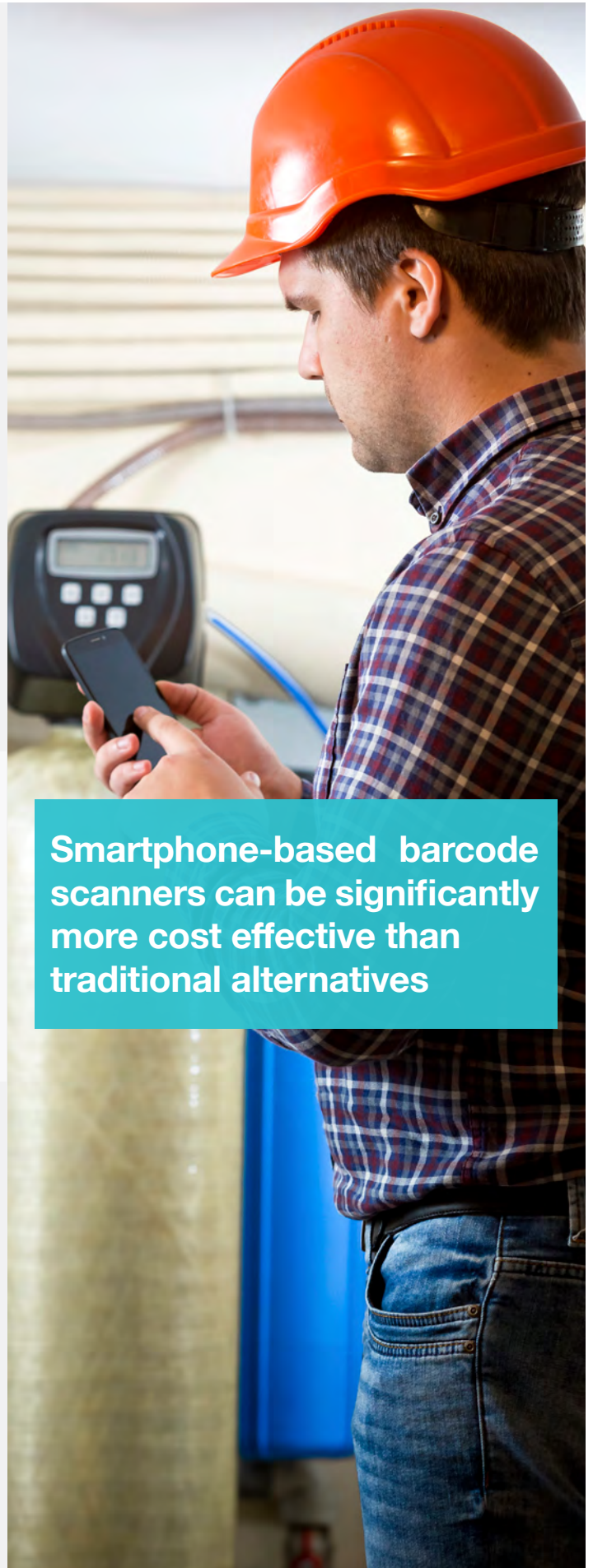>
> *- VDC Research*

Smartphone-based barcode scanners can be significantly more cost effective than traditional alternatives

Sources

1 TCO established by referencing Exhibits 2 & 4 from the "TCO Models for Mobile Computing and Communications Platforms" study conducted by VDC Research, 2007.

2 Price obtained from Amazon as of 11/20/14. Does not include tax or bulk/wholesale discount.

3 Price obtained from Barcodes Inc as of 11/20/14. Does not include tax or bulk/wholesale discount.

4 Quote obtained from "SMARTPHONE TOTAL COST OF OWNERSHIP: Analyzing the Impact of Device Failure for Line-of-Business Applications" study conducted by VDC Research, 2015.

About Scandit

Scandit delivers high performance mobile solutions for smartphones, tablets and wearables, designed to transform consumer engagement and operational efficiency for today's forward-looking enterprises.

Scandit solutions are built on its patented software-based barcode scanner and are used in a variety of industries including retail, manufacturing and logistics. With nearly 20,000 licensees in more than 100 countries, Scandit processes more than 200 million scans per year and develops enterprise-grade solutions for many of the world's most prestigious brands including Ahold, Coop, Home Depot, NASA, Saks Fifth Avenue and Verizon.

Founded in 2009 by a group of researchers from MIT, ETH Zurich and IBM Research, today Scandit and its network of global integration and technology partners are pushing the boundaries of mobile AIDC (automatic identification and data capture), delivering groundbreaking identification and data capture applications to customers. For more information visit www.scandit.com.

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