Migrating Legacy Enterprise Mobile Applications

Getting It Right Means Everything

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Introduction

Enterprise mobility solutions are business critical. From enhancing workforce productivity to improving customer service and extending asset lifecycles, mobile solutions have become inextricably interconnected with many mobile enterprise workflows. Although the use of mobile solutions to communicate and collaborate with one's workforce and customers is increasingly the norm, these solutions are far from "normal" and often represent a compelling competitive differentiation. However, enterprise mobility solutions also represent substantial investments for organizations and are not without deployment and support challenges. Leading these challenges is the fact that the most popular and widely deployed operating systems for enterprise-specific mobile devices – specifically embedded operating systems including Windows CE and Windows Embedded Handheld (WEH) 6.5 – are off Microsoft mainstream support and are reaching their end of service (EOS). With no backward compatibility offered by Microsoft, migrating to a next generation platform will require a rewrite of existing applications.

With the massive volume of Android mobile device shipments and the exuberance surrounding all things Apple, it is easy to ignore Microsoft. At the end of the day, their global smartphone market share amounts to a couple of percentage points. However, among enterprise-specific rugged mobile devices, Microsoft reigns with over 90% market share of the 15M+ devices in use today. These devices are being used by some of the most iconic brands to help their businesses run more efficiently and ultimately more profitably. It is these devices and the applications they support that will require an upgrade. However, there is no clear path forward with several options for decision-makers to consider. Each of the options – sticking with Microsoft, migrating to Android, or adopting Apple mobile devices – has its benefits and limitations. Requiring significant investments and ensuring no disruption to operations, getting these decisions right will mean everything.

This whitepaper is written to support enterprise mobility decision-makers with their next generation OS strategies. Taking into consideration the unique requirements of the applications and workflows supported by enterprise mobile devices, the key factors driving OS differentiation and enterprise viability will be addressed.

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How Did We Get Here?

Rugged enterprise handheld mobile computers are used as data collection and processing devices across a variety of workflows in virtually every industry. These devices are ubiquitous in warehouses and distribution centers for inventory and material management applications to courier delivery drivers supporting parcel delivery verification and beverage distributors supporting digital exchange. Organizations rely on these devices to conduct business critical applications and operations in real time. However, the dominant OS supporting the devices is nearing its end of life, leaving current customers with no clear migration path forward. Put another way, no matter which OS platform an enterprise looks to deploy next to support these applications, the application will need to be redeveloped and recoded as it will not be forward migratable.

Over the past decade, Windows CE and WEH 6.5 have become the OS platforms of choice for the majority of enterprise mobile devices. The platform has offered its enterprise customers a broad portfolio of devices to select from; as well as strong development tools, a stable developer community and wide support among enterprise mobility-focused ISVs. In addition, with support from Microsoft for 10 years, enterprise customers received the stability critical to their enterprise mobility investments. However, Microsoft also recognized that their mobility efforts were not resonating with the broader market – especially consumers – and made a critical decision to develop a platform that took better advantage of the significant advances in mobile hardware and conformed to the touch-centric sensibilities of today's leading mobile solutions. Microsoft's initial attempt was Windows Phone 7 (WP7) which was introduced in 2010. WP7 was based on the Windows Embedded Compact 7 version of Windows CE, which was also used in Windows Mobile. The platform was designed with consumers in mind with tight integration of social media and other services and did not offer a viable enterprise device vision. The market did not take with Microsoft ending service for WP7 in 2014, two years after the release of Windows 8. In addition, and most importantly for the enterprise device community, as of January 2015, WEH 6.5 is completely off Microsoft mainstream support with only security patches provided until 2020.

Thus, the need to equip mobile workers with updated mobile devices and software over the next several years is clear. What is less clear is the direction to take in terms of next generation platforms. Options available to customers include Android, Windows Embedded Handheld 8.1, iOS, and eventually Windows 10. Alternatively, customers can elect to remain on legacy platforms knowing that Microsoft will no longer issue security patches and software updates after they have reached EOS, thus increasing risk and potential cost of ownership and support of these specialized devices. Beyond next generation platform, enterprise customers are also weighing the decision of timing. Although the EOS deadline of 2020 is fast approaching, the lack of a viable Windows option – beyond Windows Embedded Handheld 8.1, which for most represents a non-starter – has driven many organizations to hold off making a decision, extending the lifecycle of existing devices. These decisions have also had a significant impact on existing Windows ISVs, a critical

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community supporting enterprise mobility solutions. While these organizations are continuing to support legacy customers, the majority have focused their R&D resources towards developing next generation applications for their customers on Android and iOS.

The Cost of Waiting

One of the clear benefits of deploying enterprise-class rugged handheld devices is in their durability and strong lifecycle support resulting in average upgrade cycles of 3-5 years. However, one of the consequences of the uncertainty surrounding OS direction has been customers postponing upgrade decisions, thus increasing the average age of the installed base of mobile devices. In fact, according to VDC's research, the average age of the installed base of rugged handheld devices has increased substantially over the past several years. In 2010, approximately 36% of the installed base of rugged handheld devices were four years or older. By 2014, that ratio had jumped to 42% of rugged handheld devices.

Exhibit 1: Correlation Between Device Failure and TCO (Source: VDC, 2015 TCO Analysis)

Equates a **5%** Increase in TCO
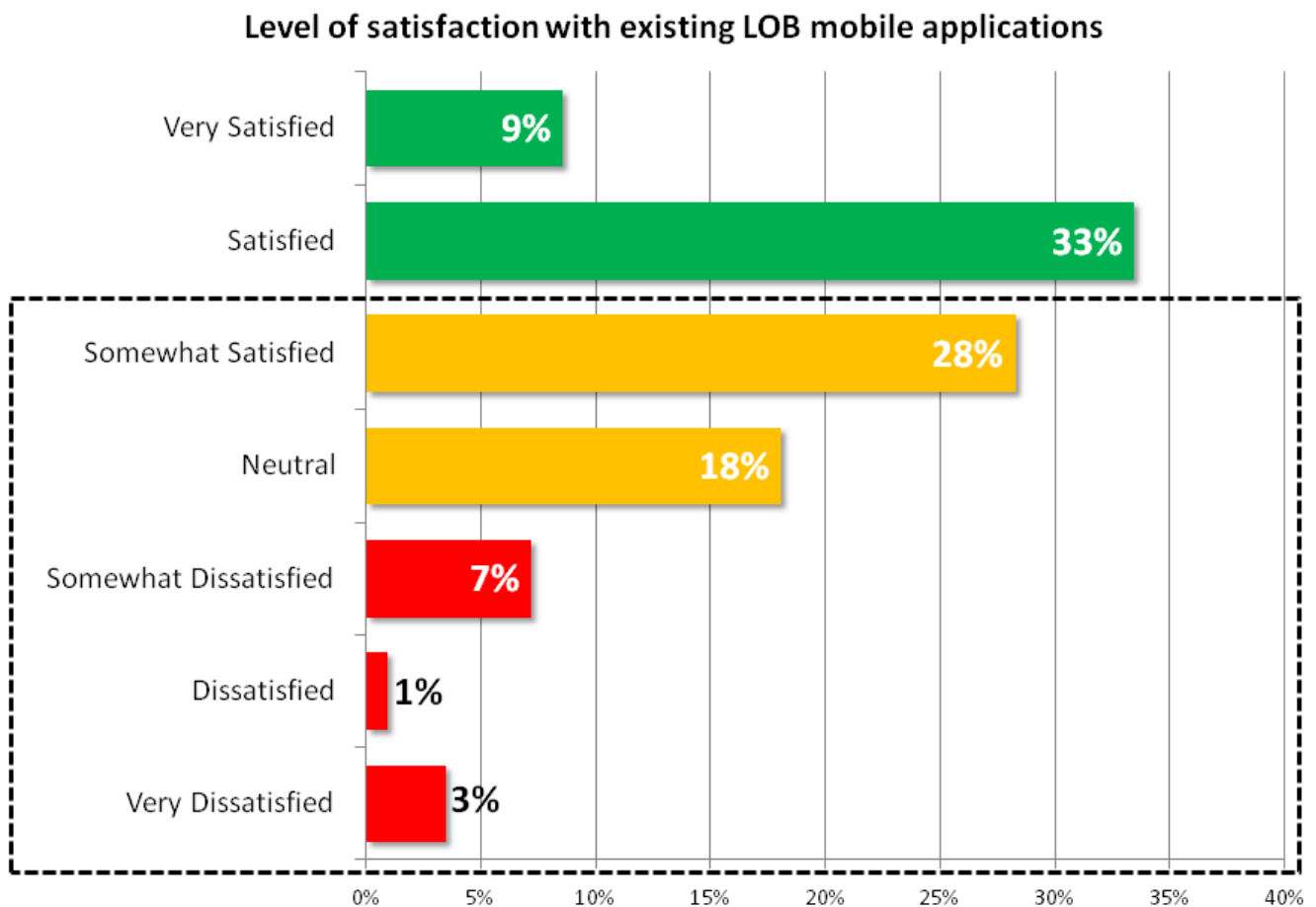
Each **1%** Increase in Device Failure…
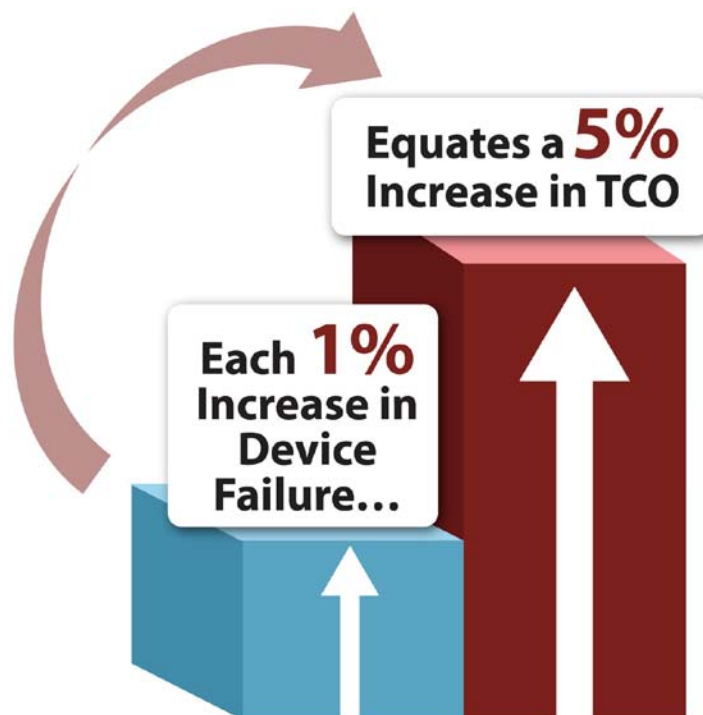
Although rugged devices are designed to withstand harsh environments and everyday use, failure rates of these devices does increase as the device ages. According to VDC's research, average annual return rates for rugged handheld devices during the first year of operation is approximately 1%. However, average annual return rates of devices in their fourth year of operation jumps to 8%. Therefore, the consequences of

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postponing the decision to upgrade one's installed base of enterprise rugged handheld devices can lead to significantly higher costs of support and ownership of these solutions. Considering that these devices support business critical operations and that any device failure leads to a loss in productivity of up to 65 minutes, the impact on operational disruption and the potential for erosion of customer service can be substantial. In fact, each percentage point increase in mobile device failure leads to a 5% increase in total cost of ownership.

In addition to the potential cost of ownership issues when extending the lifecycle of enterprise mobile solutions, what is also increasingly evident is that the level of satisfaction with legacy enterprise mobility applications is waning. Not only do these applications not conform with the expectations of what modern mobile applications should look like, they similarly do not take full advantage of the capabilities of today's mobile devices. Moreover, lacking an intuitive user interface can significantly impact workforce productivity and performance.

Exhibit 2: Satisfaction with Line of Business (LoB) Mobile Applications (Source: VDC, 2015)

Level of satisfaction with existing LOB mobile applications

| Category	Value
Very Satisfied	9%
Satisfied	33%
Somewhat Satisfied	28%
Neutral	18%
Somewhat Dissatisfied	7%
Dissatisfied	1%
Very Dissatisfied	3%

Source: 2015 Enterprise Mobility Decision Maker Survey; n=533

One area where this is particularly acute is for warehouse and distribution center operations which are supported by part-time seasonal workers during peak times. Training these workers on legacy keyboard-based interfaces can take up to 2-4 days, while in most cases training on more modern touch-centric applications can be reduced down to several hours. For organizations such as Amazon, which hires up to 100,000 seasonal workers, this translates into substantial cost savings and operational improvements.

The Mobile Options

Exhibit 3: Smartphone OS Market Share (Source: VDC, 2015)
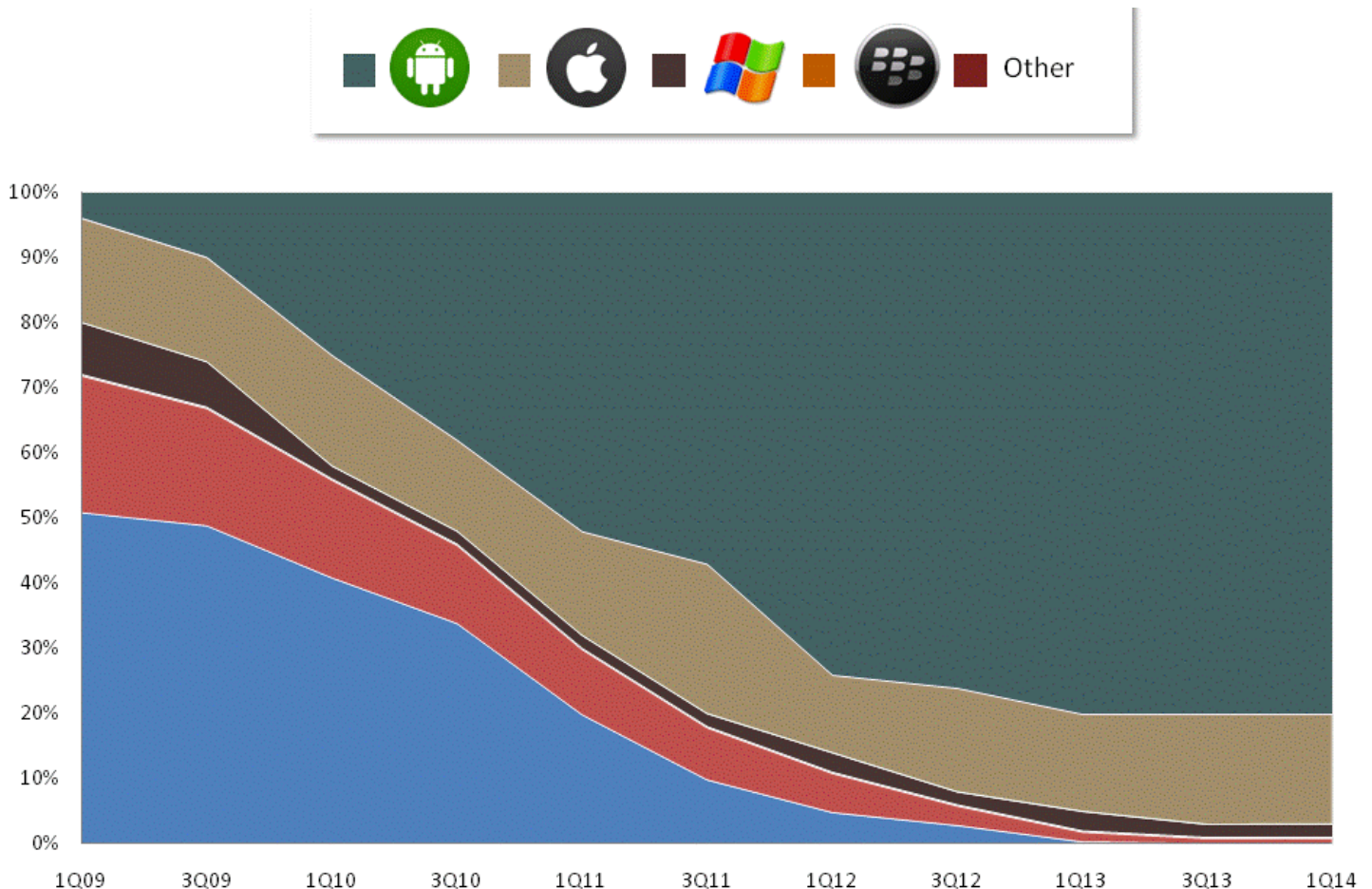
Android is the leading smartphone operating system with approximately 80% market share. With its origins firmly rooted in consumer mobile devices, Android has recently made significant inroads as an enterprise mobile platform suitable for business critical mobile applications. The Android ecosystem benefits from widespread support from a diverse group of OEMs and a growing community of ISVs and developers. However, the vast success and rapid ascension of Android has also exposed many of its vulnerabilities. As an open platform that provides OEMs with opportunities to

customize, the issue of platform fragmentation is a legitimate concern. Moreover, the success of Android devices has made it a popular target for malware attacks. Finally, the rapid development of the platform – following the release of Android 6.0 (Marshmallow) there have been 13 updates or versions since the release of Android 1.0 in 2008 – is a concern for enterprise customers for whom platform stability and lifecycle support come at a premium.

However, various initiatives by prominent Android OEMs, Google and MDM ISVs have evolved the platform into a more robust option for enterprise applications. Enterprises have the option to prevent access to Google's Play Store, can prevent side loading of applications and control access to the Internet on these devices. In addition, through widely available MDM solutions, devices can be managed and supported via a centralized dashboard. In addition, the ISV community that has built businesses around developing solutions for legacy Windows platforms has migrated many of these applications to Android. Ihe issue of platform fragmentation can actually be of benefit to the enterprise device eco-system as device OEMs can provide extended support for legacy platforms and not force customers to persistently migrate to the latest OS version. Consequently, by the end of 2015, 20% of rugged handheld unit shipments will run on Android.

Microsoft's answer to the next generation platform for rugged handheld devices is Windows Embedded Handheld 8.1. The platform has been adopted by a small number of OEMs, however, the devices available supporting this platform today are limited. Other limitations include lack of MDM support and issues relating to VPN integration. While Microsoft is providing support for this platform through 2019, its efforts and focus have shifted towards Windows 10. Microsoft's approach with OEMs supporting Windows Embedded Handheld 8.1 and Windows 10 has been to more tightly control specifications, limiting customization options to OEM partners, solution providers and end users.

The impact of Windows 10 on the rugged handheld market is still largely unknown. Microsoft will have 10 editions of Windows 10 with the version of enterprise devices labeled Windows 10 IoT for Mobile Devices. Although adoption of Windows 10 on PCs is ramping substantially – primarily among consumers – the version for enterprise rugged handheld devices is not currently available. While products are expected to become available in 2016, the continued postponement of the release of the version for enterprise rugged handheld devices could jeopardize that schedule. Consequently, the pent up demand that does exist for a Windows solution among many existing rugged handheld customers has forced some of the market into a pro-longed holding pattern, while many are increasingly migrating to alternative platforms. Other unknowns that are contributing to customer's concerns include the pace at which Microsoft will provide updates moving forward and the guarantee or protection against a similar scenario occurring that will force an application re-write in the near future. In addition, lack of customization options for enterprise customers will in several cases also represent a critical concern.

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Unlike Android or legacy Windows embedded OS platforms, Apple's iOS is a tightly controlled environment with Apple the only supplier of mobile devices. Although Apple designs products and applications primarily with the consumer in mind, it is increasingly targeting the enterprise and is actively developing relationships with leading enterprise integrators and solution providers. Apple's share of the smartphone market ranges between 15% and 20%, and, although Android is gaining ground, today has arguably broader enterprise presence and support.

Apple, however, is not well positioned to support many of the more specialized applications supported by ruggedized devices. Although iPhones can be accessorized with protective cases and scanner sleds to enable some of the enterprise functionality required for these applications, the final solution often reflects a series of compromises.

HTML5 offers the opportunity or promise to develop cross-platform applications that can be ported seamlessly from one platform to another, and provides some level of protection from the rapidly changing mobile landscape. The HTML5 standard has evolved to address some of the limitations of earlier versions including offline support and support for certain device-side capabilities such as the camera or scanner. However, for many enterprise mobility applications – especially those with more sophisticated data capture and management requirements – enterprises prefer the performance of native applications and typically relegate lightweight "micro" applications to HTML5. According to recently conducted research by VDC, enterprises supporting or developing line of business mobile applications prefer native development over other options.

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Conclusion

Rugged handheld devices are used to support some of the most business critical applications today. However, the underlying operating systems supporting applications running on these devices are rapidly reaching EOS. Thus, the need to upgrade the applications to run on modern operating systems is an imperative facing thousands of the largest and most iconic brands the world over. Ensuring that decisions made regarding next generation investments do not compromise their utility is imperative. From an OS perspective, decision-makers have several options, each of which carries with it benefits and potential concerns. Moreover, from an application development perspective, options exist including rewriting/recoding the application natively, leveraging HTML5 or using cross-platform tools that leverage existing .NET/C# skill sets. There is no silver bullet answer. However, doing nothing or pursuing the wrong option can result in performance issues, disruption to operations, and budget overruns. Ultimately the right decision will be based on a combination of key factors including ISV support and availability of third-party applications, availability of enterprise-class software tools to support and manage your mobile devices and applications, access to talented developers who can support your initiatives, and a broad portfolio of mobile devices to select from that best support your requirements.

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About the Author

DAVID KREBS has more than 10 years' experience covering the markets for enterprise and government mobility solutions, wireless data communication technologies, and automatic data-capture research and consulting. David focuses on identifying the key drivers and enablers in the adoption of mobile and wireless solutions among mobile workers in the extended enterprise. His consulting and strategic advisory experience is far reaching and includes

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About VDC Research

Founded in 1971, VDC Research provides in-depth insights to technology vendors, end users, and investors across the globe. As a market research and consulting firm, VDC covers AutoID, enterprise mobility, industrial automation, and IoT and embedded technologies, and is among the most advanced in the industry, helping our clients make critical decisions with confidence. We also offer syndicated reports and custom consultation. Our methodologies consistently provide accurate forecasts and unmatched thought leadership for deeply technical markets. Located in Natick, Massachusetts, VDC prides itself on its close personal relationships with clients, delivering an attention to detail and a unique perspective that is second to none.

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