



Microsoft Embedded Operating Systems

Support implications from a Device Manufacturer's Perspective

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Introduction

Keeping customers satisfied and coming back to do more business is always a top priority for companies. At the same time, consumer mentality based on smartphone use has raised the bar in terms of innovative approaches to automation and mobility in the workplace. Enterprise guidelines demand high level of reliability, security and high-quality service for their business critical devices.

Market research and Datalogic customer feedback demonstrates a very discerning and technology savvy end customer that is not willing to tolerate lower levels of service. Rather than remaining loyal customers, they're more likely to take their business elsewhere if services are not up to their expectations.

Currently, there is a shift in technology in the works but is still evolving. For example, Microsoft has recently made a choice to drop legacy overhead in exchange for a more innovative platform approach that will enable growth in tablet and smartphone markets, among others. This need is being driven from competing consumer oriented platforms such as Android and iOS that are now encroaching into the enterprise. While this is good for gaining efficiency in the workflow, this new approach needs to mature (risk vs. gain) before the enterprise feels confident in the value of adopting. A good example of this is in the trend we see with Windows OS on desktops, most enterprise customers skip one or sometimes even two versions until the benefits clearly outweigh the risks.

Keep in mind that while the Windows desktop world is a very open architecture approach driven by the need for universal support by 3rd parties, in contrast rugged handheld devices use a very closed approach, much to the benefit of its users. The rugged handheld device manufacturer must do a high level of integration of the Windows kernel provided by Microsoft and port to their specific hardware and feature offering. In turn the rugged device manufacturer is responsible in total for the device reliability and stability and is able to extend support way beyond (5 years or more) what Microsoft alone can do for their extended support.

Demands of Rugged Handheld Industries

Receiving excellent customer service and satisfaction typically rates very high on the enterprise list.

Datalogic understands that beyond rugged handhelds, partners and customers expect providers to deliver reliable products and top notch support. Customer loyalty is only earned by the support received from business providers. And length of support provided by the manufacturer is a critical factor for enterprise customers.

Research in this area delivers a strong message: Customers will not hesitate in dropping one provider for a competitor whenever they're not receiving the level of support expected. Customer support needs transcend regions and culture. For example, in the 2012 Accenture Global Consumer Survey, queried 10,000 consumers in 27 countries, two-thirds of respondents said they switched suppliers as a result of poor customer service. Imagine impact to your business if six out of every 10 became dissatisfied with service your business provides and decided to use a competitor's product instead of yours?

Mobility Feature Demands of Rugged Handheld Industries

One of Datalogic's core lines of business is mobile computers within its Automatic Data Capture division, targeting retail, manufacturing, transportation & logistics and healthcare industries. A natural approach to determine what customers need in mobility devices is derived from working closely with customers to identify critical needs both in terms of service and product features.

Research from respected firms, such as VDC among others, in the verticals being served by rugged handheld terminals is another angle closely monitored by the Datalogic team. Delivering high quality mobility products that address customer needs works hand in hand with excellent customer service.



Source: VDC 2013

Windows Embedded CE6 r3 and WEHH6.5: Best Mobility OS Choice

Determining platform of choice for mobile products is key to the success and acceptance of a product. There is always a tradeoff between high tech, new features vs reliability and legacy compatibility. Compatibility weighs heavily on acceptance from the enterprise.

Datalogic has selected CE6 and WEHH 6.5 for its current X3 and X3+ product lines for two main reasons. Both CE6 r3 and WEHH6.5.3 have a track record of stability and reliability. Together CE6 and WEHH 6.5 have approximately 85% share of small form factor rugged mobile devices being manufactured today. Compact 7 and now Compact 2013 (released late 2013) are out there but have not yet had the adoption one would like to standardize on. Two key reasons for this:

1. CE6 is still the platform of choice for Compact Embedded by far. Performance and functional differences between CE6 and Compact 7 are minor in comparison to the testing and validation that solution providers and end customers would need to perform to start using CE7.
2. Compact Embedded 2013 is the latest version of CE and is where significant architecture, functional and performance improvements come in. However, no rugged handheld devices for this version have been released as of early 2014, to our knowledge. This is in part due to Microsoft's removal of numerous legacy compatibility features.

On a separate note, Windows Embedded 8 Handheld (WE8H) is the next generation of WEHH (aka Windows Mobile) released in late 2013. There are some big challenges for device manufacturers, solution providers and end users with this platform as it broke all backwards compatibility. This whole new OS based on Windows Phone 8 will take some time to stabilize and mature before end customers' trust it and complete new

development of solutions targeting this OS. Additionally, most major device manufacturers have elected to hold off releasing WE8H products until v.next release later in 2014, when it is rumored to offer enterprise ready functionality.

'Given its legacy position in this market and the significant investments in the Windows Mobile and Embedded CE platforms, Microsoft remains the logical choice for next generation solutions.' Source: VDC 2013

Microsoft Product Lifecycle

Microsoft has the best support lifecycle policy in the industry by far and provides consistent and predictable guidelines for product support to its partners from product release and throughout that product's life. Fifteen years of product availability, ten+ years of support, no-cost security updates, and premier account management are key advantages of being a Microsoft partner (Datalogic is a Microsoft Gold Partner).

For further reference, following are CE and WEHH lifecycle data.

	Products Released Life Cycle Start Date	Extended Support End Date	Distribution End Date
Windows Embedded Handheld 6.5 (Falcon, Elf, Skorpio, Lynx)	December 2010 ^{Note1}	January 2020	April 2022
Windows Compact Embedded 6 [CE 6] (Falcon, Elf, Skorpio, Memor)	November 2006	April 2018	February 2022
Windows Embedded Compact 7	March 2011	April 2021	February 2026

SOURCE: MICROSOFT

NOTE1: WEHH 6.5 was originally released as Windows Mobile 6 in May 2007. This version was upgraded to Windows Mobile 6.5 in September of 2009; Windows Mobile 6.5 was rebranded to Windows Embedded Handheld 6.5 on December 2010.

An important note on this subject is to remind Datalogic partners and end customers that the Support dates are related to Microsoft OS updates that Datalogic end customers would not receive directly, they are furnished to the device manufacturer only and they decide if the patch or update warrants a new firmware image (may not impact their customer use cases).

Microsoft Support Lifecycle Policy

The Microsoft Support Lifecycle (MSL) policy is a worldwide policy. However, Microsoft understands that local laws, market conditions, and support requirements differ around the world and differ by industry sector. Therefore, Microsoft offers custom support relationships to device manufacturers such as Datalogic that go beyond the Extended Support phase. These custom support relationships include assisted support and hotfix support, and can extend beyond 10 years from the date a product becomes generally available. Also, Microsoft partners, such as Datalogic (Gold Partner), offer support beyond the Microsoft Extended Support phase.

Mainstream Support, Extended Support, and online self-help support

Support provided	Mainstream Support	Extended Support
Paid support (per-incident, per hour, and others)	X	X
Security update support	X	X
Non-security hotfix support	X	Available to Device Mfr for added fee
No-charge incident support	X	
Warranty claims	X	
Design changes and feature requests	X	
Product-specific information that is available by using the online Microsoft Knowledge Base	X	X
Product-specific information that is available by using the Support site at Microsoft Help and Support to find answers to technical questions	X	X

Note A hotfix is a modification to the commercially available Microsoft product software code to address specific critical problems.

Per Microsoft, “If you own a device or solution developed with Windows Embedded software, please contact the respective manufacturer for support.”

Datalogic Support Policy: Protecting Customer Investment

Datalogic products are strategically developed to maximize and future proof your investment. As a Gold Member of the Microsoft Partner’s Program, Datalogic provides support and services beyond Microsoft extended support end dates.

Unlike PCs that run an operating system out of the box, with Datalogic mobile computers - end customers never need to contact Microsoft for any support. As a device manufacturer, Datalogic takes full responsibility for the entire device including the operating system which is one part of our firmware image. Our customers need never be concerned about Microsoft’s end of support policies as this has very little likelihood of having any impact on the supportability or reliability of the product, and in the end Datalogic has complete responsibility for its firmware image.

Microsoft typically drops “extended support” after 10 years for embedded products due to the maturity of the product and lack of need for further updates (theory is that the system is very stable even after a few years, but Microsoft continues to support for minimum of 10 years). Datalogic extends Microsoft’s support policy to a minimum of 5 years after our announced End of Life of a Datalogic product. Datalogic has the option to request support from Microsoft even after their end of extended support, if required. Reality is Datalogic has never in its history needed to do that, but we have the option should there be a need in the future.

Device downtime is not acceptable in an enterprise environment. Datalogic devices must be in use enabling worker productivity as expected by customers. Worldwide support coverage and well trained experts keep Datalogic customers satisfied.

When a device needs to be returned to device manufacturer, device downtime will inevitably affect productivity and TCO. Although an ideal solution might be to keep spares at hand, this isn't always possible. Datalogic understand that device downtime is not an option. Top notch support means a cost effective support policy that covers normal wear and tear to accidental breakage of the mobile device (i.e. broken screen). A variety of options ranging from overnight replacement to end user data restoral will protect our customer's investment.

Firmware Image: What is it?

Because there are various elements that make up a mobile computer system, one of them being an operating system, a container is provided to deliver features and functionality provided to end customers. These elements are contained in what is commonly referred to as a "firmware image".

Microsoft provides the operating system which is one (granted "critical") component of the overall firmware, whereas Datalogic provides many other components to offer a complete mobile device firmware image. Datalogic goes thru an extensive product development process to ensure stability, security, compatibility with 3rd party software providers and consistency across product platform (extremely important to solution providers that expect one solution to work across Datalogic devices). Following table provides a high level view of what is contained in a Datalogic device firmware image:

Firmware Image Components

Component	Datalogic	Microsoft
Operating System Kernel (CE 6/WEHH6.5)		X
Radio Drivers*	X	
Supplicant (Security)*	X	
Scanner drivers and decoding algorithms	X	
Development Tools (SDKs)	X	X
Power Management	X	
Connectivity Management	X	
Configuration/Device Maintenance Tools	X	
Device, System and Internet Browser Lockdown*	X	
Device and Application Management (MDM)*	X	
Cross Datalogic device application compatibility	X	
Backwards compatibility for customer applications (within OS constraints)	X	

* Maybe be provided by licensed 3rd parties, certified by Datalogic

After initial product release, there is a continuous cycle of enhancements and corrective maintenance carried out by the device manufacturer (Datalogic) with firmware images. This process includes all activities for the diagnosis and correction of any defect along with updates and enhancements including:

- Defects reported by customers or discovered by Datalogic Quality Assurance team.
- Updates from Microsoft, Datalogic software components or third parties, such as the Wi-Fi driver, the RIL driver, software libraries for scan engine, the tools inside the control panel, SDK software, etc.

Prior to releasing a firmware image, it goes thru rigorous testing cycles and customer validations. New releases must be backward compatible with previous versions and must meet compliance of the product to market demands, legislation, environmental interventions and alignments to the other Datalogic products. As a final step, certification from Microsoft (for WEHH) must be obtained before a firmware image is formally released to our customers.

Summary and Conclusion

In conclusion, the device manufacturer is responsible for the product as a whole through its entire lifecycle. With Datalogic, end of support for a product comes at least 5 years after our announced end of life. Service and support from the device manufacturer should be a critical factor. The Microsoft operating system is one piece of the solution puzzle and rest assured that Datalogic will leverage its relationship with Microsoft in the unlikely event that support is ever needed after end of the extended support period. It is the device manufacturer in the end that is responsible for producing a reliable and stable product, regardless of Microsoft or any other 3rd party software or drivers embedded in our image – and don't forget the hardware!

