Which OS to Choose for Warehouse Management Application Development

Considerations on matching OS and software requirements for rugged mobile devices to outfit the workforce

ADVANTECH

By Advantech iService Business Group

Digital Logistics as a Changing Landscape

Hardware and software designers in the logistics market have been handed a significant challenge to deliver products that help logistics providers meet immediate fulfillment accuracy and adapt to the frequent management software changes in today's roiling logistics landscape over the past years. Many distribution and fulfillment (D&F) operations encounter barriers to achieving process improvements, providing a great opportunity for warehouse management system (WMS) offerings that streamline warehouse and distribution center (DC) functions, optimize all facets of supply chain management, and are interoperable with the D&F customers' existing process. With these mandates in the logistics industry, a set of mobile device hardware and software offerings that meet these needs can expect favorable market demand.

In addition, cloud application adoption in WMS has increased over recent years. In supply chain execution, cloud integration has been a boon for IT-delivered resources, including warehouse, transportation and yard management systems. Therefore, as VARs and system integrators that approach the logistics market with the principal that digital logistics, and WMS in particular, feature the need to adapt to a shifting landscape of connectivity and edge computing in order to stay reliable, it will be easier to ensure that their go-to-market product offerings are both adaptable and future-proof. The choice of what Operating System (OS) for the design platform (Android®, Windows® or Linux®) becomes key for a product's success. Since the OS platform selection greatly informs hardware and software design decisions, we will take a look at the advantages of each of the popular OS from a mobile product development perspective and address overall considerations for today's WMS needs.

The Decision for Warehouse Management – An OS Comparison

Even when the product spec may have some unique attributes, the choice of OS hardly tips one way vs. another in the first design meeting. Yet before a software or hardware product begins the development stage, the choice of whether to design for Android or Windows is often an early discussion point. More frequently than not, the choice trends toward which OS the design team is most familiar with. While this OS familiarity factor may result in a more rapid product development in certain stages and perceived ease in later troubleshooting, this OS platform familiarity aspect alone should not be the deciding factor.

Designers benefit themselves when they hold the merits of the OS decision through the lens of the benefits that it will play to the end user firstly.


Android


Windows


Linux

Android as a WMS Platform

Along with its consumer market popularity, Android has increased in use in the mobile warehouse environment in the past decade, and for good reason. It has offered a familiar and intuitive user interface for diverse users across industries, and is known for its ease-of-operation and low compute requirement. Its comprehensive software ecosystem affords the ideal API availability, as well as good utilities and applications that exist across mobile devices.

In addition, it offers different partner support programs from Google, such as the ability to manage warehouse mobile tablets via Google® GMS (Google Mobile Systems) and Google Play® for easy app downloads. These all become motivating factors for its selection. Android is arguably the OS that, once having done a design-in, poses the largest chance of success that a developed app can be ported for other OSs, and thus is a more device-agnostic platform than others are. This is closer to the achievement of a “one architecture” concept than most other OSs.

From an OEM perspective, Google also offers the Android Enterprise Partner Program. So businesses can confidently select, deploy, and manage Android devices and services that meet enterprise requirements, all while ensuring validation by Google.

Windows as a WMS Platform

Although Windows Mobile went end-of-life in 2020, Microsoft Windows 10 is still the mainstay that sees its way in the warehouse in equal measure to enterprise users. With the familiar and easy-to-use Windows 10® interface and multi-tasking ability, the platform will continue to be a key OS selection – predominantly when on a 10” screen format or larger - to deliver high-performance apps for mobile users and workstation users in D&F operations.

Partially due to its being a largely adopted commercial software, Windows benefits from a large official support base, such is evident with its deep driver and peripheral compatibility. Additional benefits include its mobile-focused support, including the Microsoft's Enterprise Mobility and Security (EMS) suite, and Microsoft Intune. Microsoft Intune® offers IT cloud-based mobile device and application management tools to configure policies, control applications, and protect an organization’s data. Both Windows and Android devices can support the Microsoft Intune client, but integration with mobile devices running Windows 10 is more rapid. In addition, Windows 10 offers high synergy with Azure® Cloud Services, offering leading edge mobile cloud-based computing models that logistics providers are more frequently leveraging.

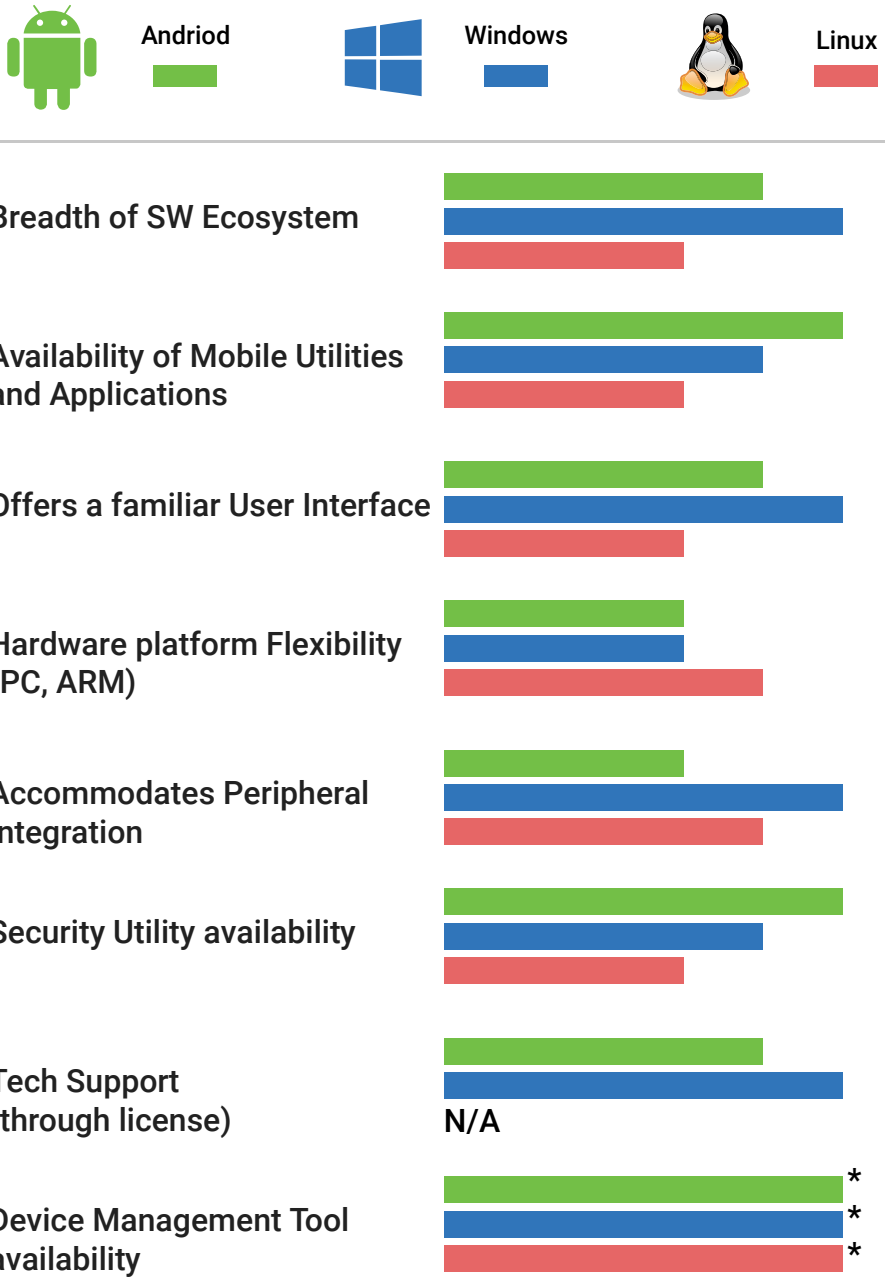
That said, Microsoft Windows 10 requires per-seat licensing fees. Consider this factor in the device pricing and the total cost of ownership (TCO). A certified partner such as Advantech Corporation can help you obtain a Microsoft CLA (Customer License Agreement), which will help mitigate the end unit cost.

Linux as a WMS Platform

Favored by the embedded market, many versions of Linux® show promise for the mobile designer, primarily due to the OSs' free license and open source nature. In addition to its variety of shared libraries and development tools, Linux offers high bottom-up scalability and flexibility that many mobile and embedded software integrators thrive in.

Most Linux versions provide a variety of choices in management options, such as support for remote access (Citrix®, Microsoft Remote Desktop, Secure Shell), and peripheral support to aid barcode scanner and RFID reader integrations, and more. However, Linux may require more of a programmer/sw development resource to bring Apps to market.

Operating System Ratings Comparison for Mobile App Designing Considerations



*Covered cross-OS through Advantech DeviceOn-iService, SOTI, or other

Source: Advantech

Other Considerations Beyond the OS

While there is much to discuss about the operating system alone from an application development perspective, there are many considerations on meeting the business side requirements and the end user preferences.

Ensuring a mature SW ecosystem plays a critical role in warehouse systems. Gladly there is a lot of cross-OS support in this arena. Mobile Device Management software, such as SOTI® MobiControl, offer popular choices for rapid device deployment, provisioning, and app management. Applications for productivity such as Ivanti® and Navis® will be a value add also, so ensuring compatibility in the choice of platform for their inclusion will be a benefit for IT teams.

Hardware and software designers for WMS mobile solutions will also need to understand the customer pain-points of spotty wireless connectivity in the DC. Solutions such as Advantech's MWLAN WiFi Booster provide IT teams with Wi-Fi status provisioning flexibility. This ensures reliable network settings for prioritized data streams. Wireless infrastructure management software, such as solutions from NetMotion®, will also benefit wireless device network connectivity.

The Double-Win of Supporting Multiple OSs

A way to ensure a good design path is to choose a mobile device product line from a trusted OEM that features support more than one OS. An example of value-added software across OSs is demonstrated with the Advantech DLT-V72 Vehicle Mount Terminals, where the Facelift version can support Windows, Android, and Linux. The built-in software utilities are offered because they can benefit logistics markets specifically, and they work smoothly across all three popular OSs, whatever the mobile designer chooses. Some examples are below.

MWedge

Integrates a data capture source from attached peripherals into targeted applications.

MStage

A staging tool to copy device settings from one device to another using USB or ADB.

Screen Blanking (for forklift safety)

Prevent operators get distraction from the screen while forklift is in driving mode. Screen goes dark when motion is detected.

WiFi Booster

Ensures a reliable advanced Wi-Fi experience.

Conclusion

The value of choosing the right OS can be crucial for a successful mobile logistics product roll-out. As much as timing is paramount in a go-to-market strategy, the decision of the OS becomes clearer when considering certain industry-specific aspects, such as flexibility of peripheral drivers needed for warehouse applications. Inventory management may require a barcode scanner integration in the field, or goods receipt and restocking may require a plug-in RFID reader. Your selection of the platform will need to accommodate the proper mobile controller to connect these extra devices easily.

In most cases, only when the list of requirements for the end user is first addressed, such as mindfulness of an intuitive GUI, flexible peripheral integration, diverse built-in utilities, and deep mobile software ecosystem, should the choice in OS come more firmly into view. Product life longevity is on your side if you have the flexibility to design an application that can be ported for multiple OSs. Current trends favor this strategy the most.

Work with a mobile device partner that has experience with Android, Windows, and Linux for Mobile applications - ideally with an established software ecosystem, API's, device management tool knowledge, and free Tech Support. You can contact Advantech to gain these benefits and select the right solution for your next logistics mobile device project.

Related Products

AIM-75/78 Rugged Tablet

Andriod

- Qualcomm SD660 Processor
- 8" or 10.1" Corning® Gorilla® Glass 3 LCD supports gloved touch
- Versatile WiFi 802.11 a/b/g/n/ac/k/v/r, Bluetooth v5.0, and 4G LTE
- Wide range of peripherals Expansion modules offer Barcode, RFID, LAN+COM extensions.

AIM-65/68 Rugged Tablet

Andriod **Windows**

- Intel® Atom™ Quad Core X8350 Processor
- 8" or 10.1" Corning® Gorilla® Glass 3 LCD supports gloved touch
- Versatile WiFi 802.11 802.11 a/b/g/n/ac, Bluetooth v4, and 4G LTE
- Peripheral options include Barcode scanner, NFC Reader come built-in. Expansion modules offer

PWS-872 Rugged Tablet

Windows

- Intel® Core™ i3/i5/i7/Celeron Processors
- 10.1” Corning® Gorilla® Glass 3 LCD supports gloved touch
- MIL-STD-810G certified design, IP65 rated
- 802.11 a/b/g/n/ac
- Peripheral options include Smart Card Reader and I/O extension. Barcode scanner built-in.

DLT-V72 F Vehicle Mount Terminals

Andriod **Windows** **Linux**

- 10.4/12.1" color TFT display
- Intel® Atom® E3845 quad-core Processor
- Supports latest 4G/LTE, BT 5.0, and WLAN
- Full IP66 rating for water and dust
- Supports a wide -30 ~ 50 °C operating temperature
- Optional screen defroster, ideal for cold chain tasks

Many of the products above offer cross-OS Advantech management software. These include the following:

Device-On/iService

This device management software suite enables remote management for mobile devices for enhanced efficiency and optimize warehouse operations. This includes notifications, remote shutdown, reboot, batch controls on multiple devices, and OTA updating.

MWLAN WiFi Booster

Ensures a reliable advanced Wi-Fi to optimize connectivity for inside the warehouse.

Advantech’s Device-On/iService is a device management software that enables remote management of field devices.

For more information on Advantech iLogistics Solutions products see Buy.Advantech.com/Go/AIM or call 888-576-9668