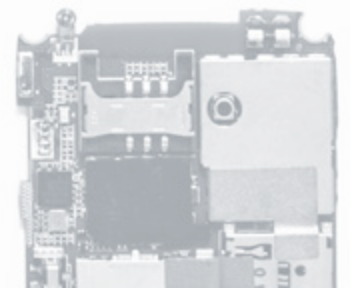
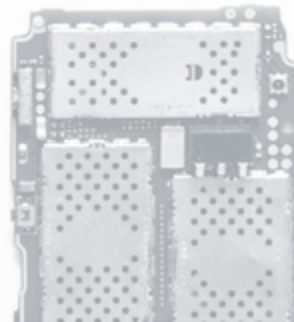
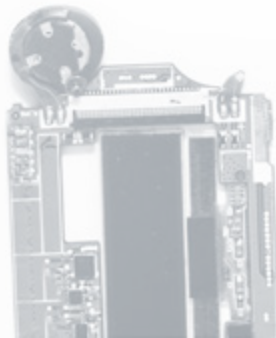
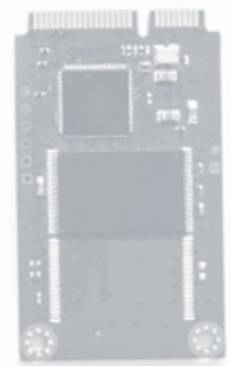
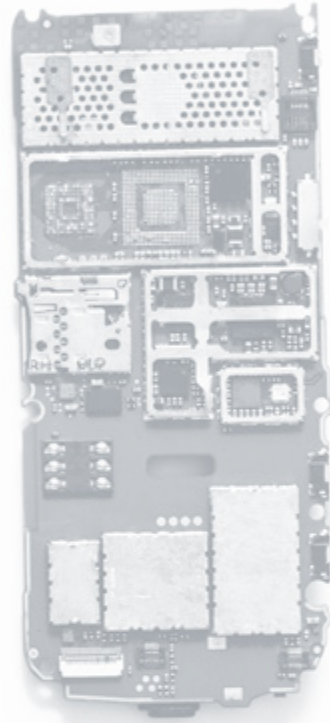
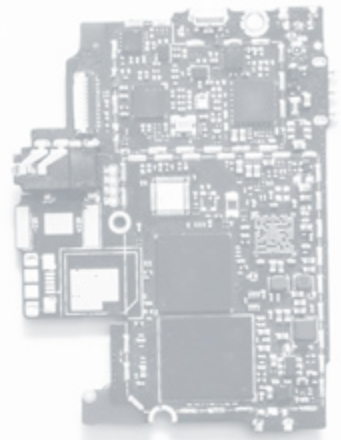
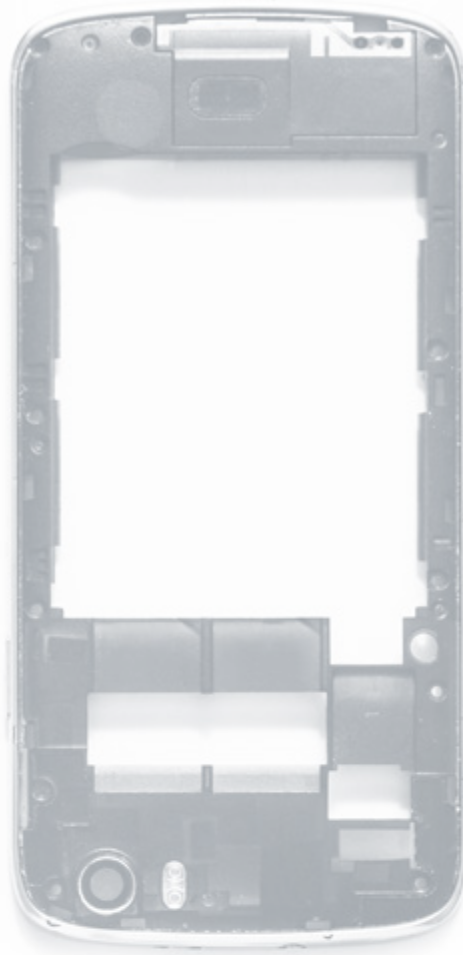


TREND REPORT: Q3 2018

# State of Mobile Device Repair & Security

December 2018



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# Introduction

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Smartphones are a crucial part of our everyday lives. And when these devices have issues, they have a huge impact on customers, ranging from simple frustration to lost business deals. From shortened battery life to frozen screens, we expect our devices to run properly. Mobile retailers need the ability to find these issues and fix them quickly.

And it's not only new mobile devices that are making a huge impact. As the second-hand mobile market continues to explode, mobile processors and resellers must process these devices efficiently and address diagnostic issues quickly to get them back out into the growing market and address customer demand.

The following research highlights the current state of the mobile market and provides information to help mobile organizations address erasure and diagnostic issues across Android and iOS devices.

## About the Data Powering the Report

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The information contained in this report is based on internal Blancco mobile diagnostic and mobile erasure data collected from iOS and Android mobile devices. These devices were brought into hundreds of mobile carriers and device processors for diagnostic tests and mobile erasure in North America, Europe, Asia and Australia from August 1, 2018 to October 30, 2018 and is supplemented by information from various external sources.

Diagnostic tests, factory resets and erasure were performed using Blancco Mobile Solutions (including diagnostic and erasure solutions), and the reports were stored on the Blancco Management Console—a central repository for accessing key data onsite or in the Cloud. Mobile retailers and processors can leverage this information to provide a better customer experience and explore and implement best practices.

Read on to see more about the following highlights:

- Second-hand Mobile Market Sees Continued Growth
- Erasure Failures by OS, Common Erasure Standards Used & Average Erasure Times
- More Storage Capacity? iOS & Android Users Say, 'Yes Please!'
- Most Common Diagnostic Tests (Mobile Processors)
- Most Common Diagnostic Issues (Retail vs. Processors)
- Top 5 Diagnostic Issues by Model (Retail vs. Processors)
- Android Diagnostic Issues by Manufacturer: (Retail vs. Processors)
- Percentage of Diagnostic Issues by Region (Retail)
- New Features Bring Increased Need for Future-Focused Diagnostics
- Is the Second-hand Mobile Market Ready for a Robotics Revolution?

## Second-hand Mobile Market Sees Continued Growth

Consumers have been buying refurbished second-hand smartphone models for some time now, but now more people are starting to take notice. As the second-hand market continues to grow, sales for new mobile devices are declining. According to the International Data Corporation (IDC) [Worldwide Quarterly Mobile Phone Tracker](#), “smartphone vendors shipped a total of 355.2 million units during the third quarter of 2018 (3Q18), resulting in a year-over-year decline of 6.0%. This was the fourth consecutive quarter of year-over-year declines for the global smartphone market.” Much of the decline is attributed to loss of market share in China and by market-leader Samsung—and the quick growth of the second market.

Figure 1.

Top 5 Smartphone Companies, Worldwide Shipments, Market Share, and Year-Over-Year Growth, Q2 2018 (shipments in millions of units)

Company	3Q18 Shipment Volumes	3Q18 Market Share	3Q17 Shipment Volumes	3Q17 Market Share	3Q18/3Q17 Change
Samsung	72.2	20.3%	83.3	22.1%	-13.4%
Huawei	52.0	14.6%	39.1	10.4%	32.9%
Apple	46.9	13.2%	46.7	12.4%	0.5%
Xiaomi	34.3	9.7%	28.3	7.5%	21.2%
OPPO	29.9	8.4%	30.6	8.1%	-2.1%
Others	119.9	33.8%	149.8	39.6%	-19.9%
<b>Total</b>	<b>355.2</b>	<b>100.0%</b>	<b>377.8</b>	<b>100.0%</b>	<b>-6.0%</b>

Source: IDC Quarterly Mobile Phone Tracker, November 1, 2018

This data comes alongside estimated predictions from research firms such as Persistence Market Research (PMR), which in its recent report, estimates the global [refurbished and used mobile phone market](#) will expand by 8.9 percent CAGR from 2017 to 2025. This adds up to global sales of \$40 billion in refurbished and used mobile phones by 2025. The company estimates that “sales of refurbished and used mobile phones in company-owned and consumer-owned markets will collectively account for 277 [million] units by 2025-end.”

As the number of new mobile device shipments continues to flatten, we can make some assumptions that consumers are investing in older devices that are “just as good” in terms of features and performance. We can also look to environmental factors. The U.S. and Japan are expected to remain dominant in the North America and APAC refurbished and used phone markets, partially due to environmental concerns, though China is expected to have the fastest growth in the market.

# Key Trends & Insights

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In North America, Canada and the U.S. have both imposed strict rules for regulating e-waste, fuelling adoption of refurbished and recycled goods in the region. According to Persistence Market Research, “the U.S. is expected to be the most lucrative country for growth of the market in North America, with sales expanding at 7.5 percent CAGR through 2025.” In APAC, new mobile resellers such as Overcart, Reboot and Greendust.com are opening up new ways for consumers to buy and sell refurbished goods.

What kinds of devices are the most popular in the second-hand market? Sources point to Apple. A Yale-led study recently analyzed roughly 500,000 listings of second-hand Apple and Samsung phones sold on eBay, and they found that the device’s brand is more important than reparability or memory size in extending the life of a product. In the [\*Journal of Industrial Ecology\*](#), researchers in the study conclude that Apple’s iPhones have an average of one additional year of use even though the Samsung Android phones they were tested against were comparable in quality and features.

As [Yale’s School of Forestry and Environmental Studies website](#) reports, “After evaluating depreciation rates based on a range of variables — including reparability, battery size, data capacity, and screen size — they found that Samsung smartphones lost their value faster and reached the end of their ‘economic’ life after 54.5 months, while Apple phones reach it after about 67 months, a difference of about one year.”

As the second-hand market continues to grow, we will continue to keep a close eye on device value, compliance and more.



## Erasure Failures by OS, Common Erasure Standards Used & Average Erasure Times

Figure 2.



### Android Erasure Standards & Factory Resets, Q3 2018

Erasure Standard	Percentage of Devices	Median erasure time (s)
Aperiodic random overwrite	71.9%	20 mins, 49 secs.
HMG Infosec Standard 5, Lower Standard	9.9%	12 mins, 37 secs.
Factory Reset	6.8%	2 mins, 18 secs.
Android smart reset (Encryption, factory reset)	6.8%	1 min, 19 secs.
Android smart reset (Aperiodic random overwrite)	2.3%	21 mins, 51 secs.
HMG Infosec Standard 5, Higher Standard	1.2%	24 mins, 26 secs.
Factory Reset (No verification)	1.0%	26 seconds
Other methods	<1.0%	N/A

Figure 3.



### iOS Erasure Standards & Factory Resets, Q3 2018

Erasure Standard	Percentage of Devices	Median erasure time (s)
Apple iOS erasure	81.7%	8 mins, 48 secs.
iOS smart reset (Verification)	18.3%	10 seconds

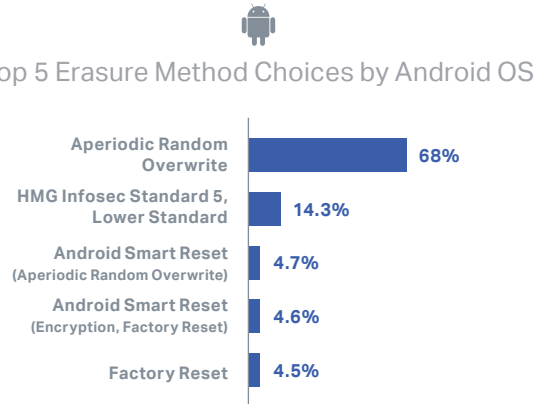
More customers are investing in secure erasure, and that's a good thing.

Most operators are choosing Aperiodic Random Overwrite to securely erase Android devices, something Blancco recommends since factory resets are not always effective for Android, especially on older models. Additionally, only 1 percent of Blancco mobile processing customers are choosing Android Factory Reset in Q3 2018, versus a significantly higher 4.5 percent in Q2 2018.

# Key Trends & Insights

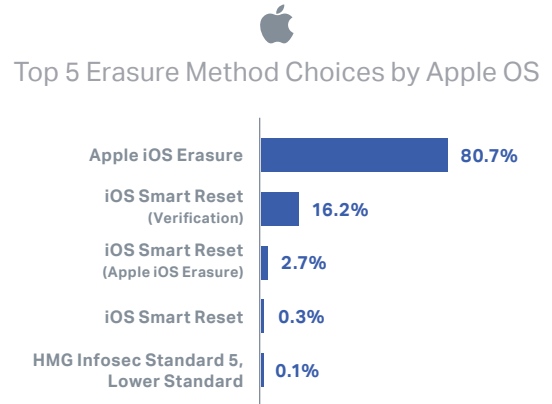
This is good news because it means that more Blancco customers are choosing to use secure methods of erasure. While Android Factory Reset may be fast, it also may leave data behind in some models, and with the added negative of lack of verification, security may be at risk in these situations. This is less important in iPhones, which with all of the supported versions are encrypted by default. Around the same number of Blancco customers are choosing to use Apple iOS Erasure as last quarter.

Figure 4.



Note: Numbers have been rounded to the nearest minute or second, whichever is applicable.

Figure 5.



Note: Numbers have been rounded to the nearest minute or second, whichever is applicable.

Note that the average Android erasure or factory reset takes about three times as long as the average iOS erasure or factory reset. This is because [a more secure erasure method is needed for Android devices](#).

Now let's take a look at how successful the erasure / factory reset process was for both iOS and Android devices.

Figure 6.

Android Erasure / Factory Reset State, Q3 2018

Erasure Standard	Percentage of Devices	Median erasure time (s)
Successful	94.9%	18 min, 16 secs.
Failed	5.1%	7 min, 11 secs.

Figure 7.

iOS Erasure / Factory Reset State, Q3 2018

Erasure Standard	Percentage of Devices	Median erasure time (s)
Successful	89.3%	7 min, 45 secs.
Failed	10.7%	3 min, 7 secs.

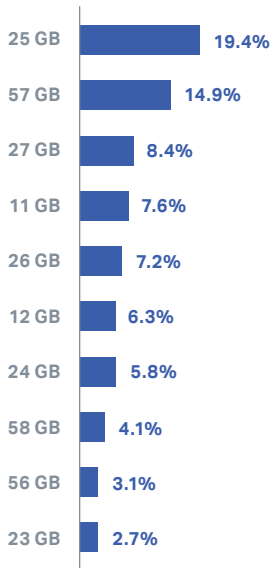
You may notice there's a significant difference between the number of overall iOS erasure failures and that of Android failures. This is because iOS erasure is much more prone to errors because there is so much more data transferred over USB. The problem is usually a bad cable connection, insufficient memory in host PC or bad networking. Blancco Mobile Diagnostics & Erasure automatically re-tries the erasure (for both iOS and Android devices), resolving most USB issues.

## More Storage Capacity? iOS & Android Users Say, 'Yes Please!'

Figure 8.



Top 10 GB Android Storage Capacity Choices, Q3 2018



Note: Does not include any storage capacity making up less than 1% of sample.

As our mobile processing customers continue to receive a plethora of used phones for resale, they collect a wide range of device data (personal data, however, is not collected or stored). One type of data they collect is information on storage capacity, and it's clear from the data that consumers continue to invest in more storage capacity. While the top choice for Android storage capacity was still 25 GB (at 19.4 percent), 57 GB models, which didn't even make the top five list in Q1 or Q2 of this year, managed to land the number two slot, with 14.9 percent. That's a huge jump and shows that customers are storing more data on their phones. Because much of this data is sensitive, it must be securely wiped before it moves through the second-hand market.

Figure 9.



Top 5 GB Android Storage Capacity Choices, Q2 2018

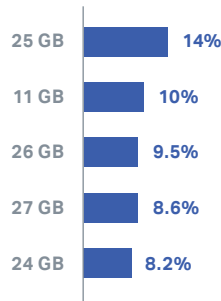
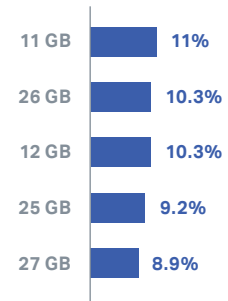


Figure 10.



Top 5 GB Android Storage Capacity Choices, Q1 2018



iOS storage capacity also increased, though not as significantly as the Android devices tested using the Blancco Mobile Diagnostic & Erasure solution. This increase can most notably be seen in the 128 GB models, which have increased from 11.3 percent in Q1 of 2018, to 17.1 percent in Q2 2018, to 20.6 percent this quarter. The 64 and 16 GB popularity has varied so far throughout the year.

Figure 11.



Top 5 GB iOS Storage Capacity Choices, Q3 2018

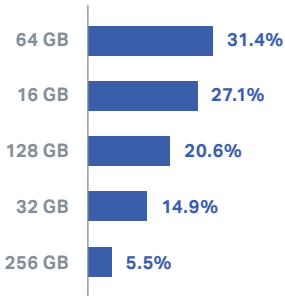


Figure 12.



Top 5 GB iOS Storage Capacity Choices, Q2 2018

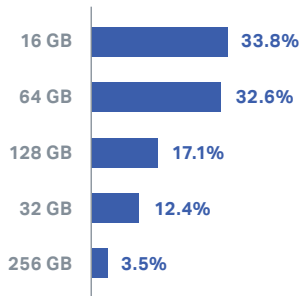
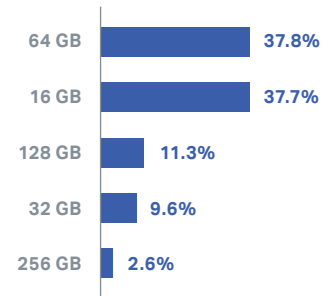


Figure 13.



Top 5 GB iOS Storage Capacity Choices, Q1 2018





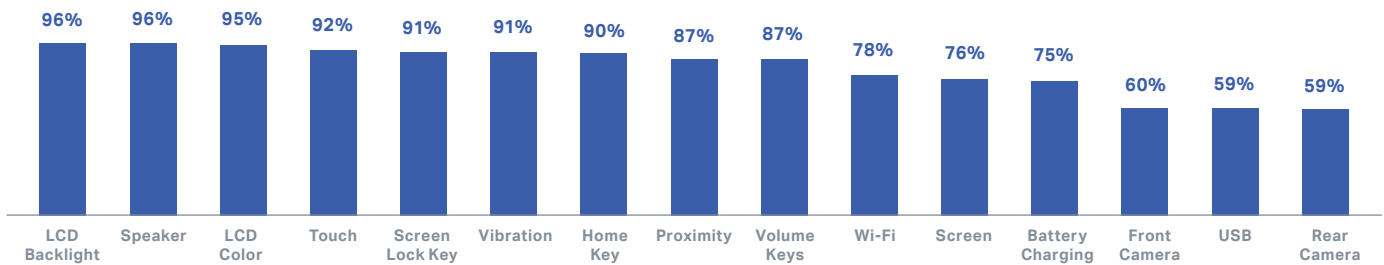
# Key Trends & Insights

## Most Common Diagnostic Tests (Mobile Processors)

Across the globe, our mobile processing customers chose from a bank of over 40 diagnostic tests this quarter to determine how well devices were performing before moving them on for resale or repair. Here are the top 15 tests performed across hundreds of global customer locations.

Figure 14.

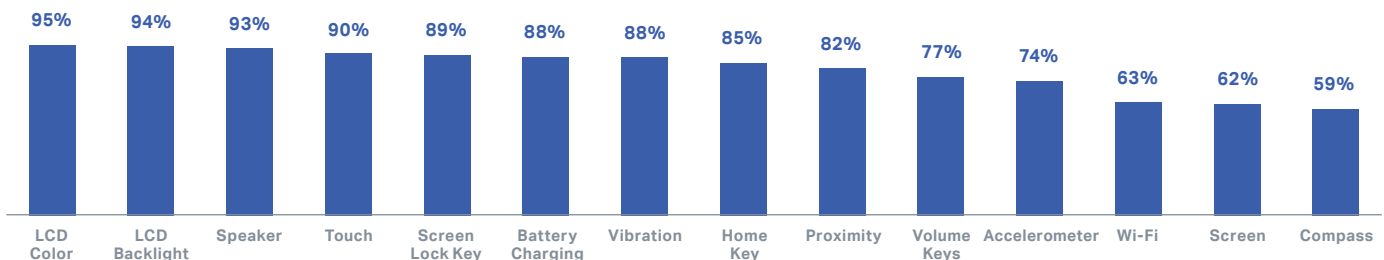
Most Common Diagnostics Tests – All OS,  
Q3 2018



Compare this with the most common tests from last quarter.

Figure 15.

Most Common Diagnostics Tests – All OS,  
Q2 2018



The tests are much the same as last quarter, though compass and accelerometer dropped off the list in favor of additional camera testing. This is interesting when we note that some of the camera tests were most likely to show diagnostic issues this quarter.

## Most Common Diagnostic Issues (Mobile Retail vs. Mobile Processors)

Both Blancco retail and mobile processing customers use Blancco Mobile Diagnostics to diagnose issues with mobile devices. Retailers do so to help customers understand any issues on the spot, while processors want to ensure that phones are in good working order before they go back out into the market. Let's look at some of the most commonly detected devices issues from both types of customers and compare the two.

# Key Trends & Insights

iOS devices tested in retail settings saw the most issues with Wi-Fi at 5 percent, an issue which didn't show up in the mobile processors sector. However, the two areas did share high levels of performance issues in headset and touch testing.

Figure 16.



Top 5 iOS Performance Issues, Q3 2018 Retail Data

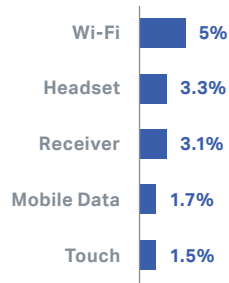


Figure 17.



Top 5 iOS Diagnostic Issues, Q3 2018 Processor Data

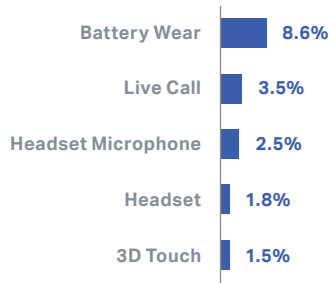


Figure 18.



Top 5 Android Diagnostic Issues, Q3 2018 Processor Data

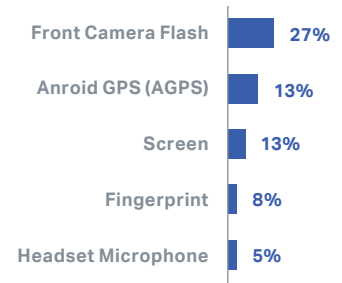
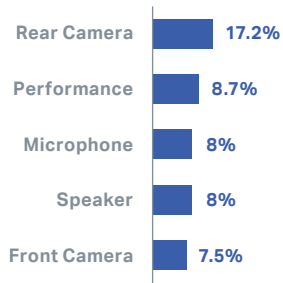


Figure 19.



Top 5 Android Diagnostic Issues, Q3 2018 Retail Data



Note: Numbers have been rounded up or down by one decimal place in some cases. Tests with fewer than 200 instances have not been included.

Android device issues differed greatly from iOS diagnostic issues, sharing only one of the same types of performance issues across operating systems (headset microphone). Cameras racked up the largest number of diagnostic issues at retail locations, at 17.2 percent, followed by performance issues at 8.7 percent. To clarify, the performance test is conducted across 3 main resources that are used by the device: RAM, CPU and disk storage. If any of these three resources are consumed more than 90 percent, the device fails the performance test.

Android processors have the most trouble with the front camera flash at 8.0 percent. Both processors and retailers saw issues their cameras on Android devices. Processors saw additional issues with screens, fingerprint and GPS functions, while retailers saw more issues with Android performance, microphones and speakers.



## Top 5 Diagnostic Issues by Model (Retail vs. Processors)



Figure 20.



Top 5 Android Diagnostic Issues Rate by Model, Q3 2018 Retail Data

Manufacturer	Model	Percentage of Devices Tested with Diagnostic Issues	Percent of Android Models Tested
OPPO	CPH1859	7.4%	5.4%
OnePlus	ONEPLUS A6000	5.7%	5.1%
Xiaomi	Redmi Y2	4.6%	3.9%
HUAWEI	BND-AL10	4.0 %	3.4%
Xiaomi	Redmi 5	3.9%	3.1%

Figure 21.



Top 5 iOS Diagnostic Issues Rate by Model, Q3 2018 Retail Data

Manufacturer	Model	Percentage of Devices Tested with Diagnostic Issues	Percentage of Overall Apple Devices Tested
Apple	iPhone 6	20.8%	12.8%
Apple	iPhone 6S	17.0%	11.0%
Apple	iPhone 7	10.9%	14.6%
Apple	iPhone 7 Plus	8.8%	10.8%
Apple	iPhone 6S Plus	7.6%	5.3%

Let's look at some of the highest- and lowest-performing mobile devices in terms of the number of diagnostic failures experienced by each.

Retailers report that the OPPO CPH1859 has the highest number of diagnostic issues, with 7.4 percent failing their diagnostics tests. This is especially concerning

# Key Trends & Insights

considering this model makes up only 5.4 percent of overall Android devices tested. This is followed by the OnePlus A6000, at 5.7 percent. All these devices have a high percentage of diagnostic failure when compared to the number of overall devices tested. As all these models were released between December 2017 and 2018, age does not seem to impact these diagnostic failures.



iOS devices, for their part, are performing similarly to past reports. As we have previously discovered, the iPhone 6 and 6S perform poorly when compared to other iOS models—and even many Android models. The iPhone 7, for its part, has a diagnostic issues rate of 10.9 percent, significantly lower than the 14.6 percent of the number of iPhone 7 devices tested overall. This speaks to the quality of this device.

Compare this to the data we received from mobile processors.

Figure 22.



## Top 5 iOS Diagnostic Issues by Model, Q3 2018 Processor Data

Model	Percentage of Devices Tested with Diagnostics Issues	Percentage of Overall Devices Tested
iPhone 6 Plus	25.9%	3.4%
iPhone 6	18.8%	8.3%
iPhone 6S	14.7%	9.0%
iPhone 7	8.7%	7.6%
iPhone SE	8.1%	2.4%

*Note: Devices making up less than 1.0% of total devices tested have been excluded.*

iOS devices that came into mobile processing centers show a similar pattern to those in retail store. The iPhone 6 models all make the list again here, with the lowest performers being the iPhone 6 Plus at 25.9 percent showing diagnostic issues, the iPhone 6 showing 18.8 percent issues and the iPhone 6S at 14.7% issues. The iPhone does a bit better here, with the number of issues closer to that of the overall number of devices tested. The iPhone SE is in fifth place with 8.1 percent of devices showing diagnostic issues.

## Android Diagnostic Issues Rate by Manufacturer (Retail vs. Processors)

Figure 23.



Top 5 Android Diagnostic Issues by Manufacturer, Q3 2018

Manufacturer	Percentage of Devices Tested with Diagnostics Issues	Percentage of Overall Devices Tested
Xiaomi	17.7%	17.4%
Samsung	16.9%	24.7%
HUAWEI	12.1%	10.0%
OPPO	9.8%	7.6%
Motorola	9.6%	8.7%

Note: Records with fewer than 100 diagnostic tests performed are excluded. Manufacturers with fewer than 0.1 percent of overall devices tested have been excluded.

Figure 24.



Top 5 Android Diagnostic Issues Rate by Manufacturer, Q3 2018 Processor Data

Manufacturer	Percentage of Devices Tested with Diagnostic Issues	Percentage of Overall Devices Tested
Fujitsu	21.8%	1.0%
Kyocera Corp.	17.1%	8.3%
Sony	17.1%	4.8%
Sharp Corp.	12.9%	2.4%
Samsung	11.9%	20.2%

Note: Records with fewer than 100 diagnostic tests performed are excluded. Manufacturers with fewer than 0.1 percent of overall devices tested have been excluded.

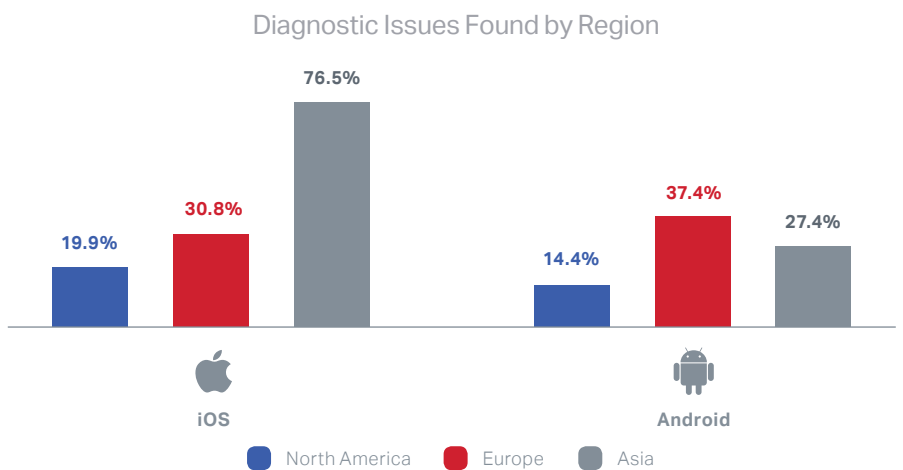
Data from retailers shows that Xiaomi have the most issues when customers bring them in store, with 17.7 percent of these devices showing some diagnostic issue upon testing. This is followed by Samsung, then Huawei, OPPO and Motorola. Note that though Samsung is in second place in terms of diagnostic issues at 16.9 percent, Samsung devices made up almost 25 percent of all devices tested, so this reflects positively against the brand. As you may note, all the other manufacturers had a higher percentage of diagnostics issues versus the percentage of overall devices processed.

Our mobile processor data shows a slightly different story, with Fujitsu devices having the highest percentage of diagnostic issues at nearly 22 percent (and making up only 1 percent of devices tested), followed by Sony, Sharp Corp., Apple and Samsung. It's worth noting that despite making up 59.1 percent of overall devices tested by mobile processors, Apple only saw diagnostic issues with 12.1 percent of its devices.



## Percentage of Diagnostic Issues by Region (Retail)

Figure 25.



Blanco brings fast, easy-to-use diagnostic testing to mobile retailers across the globe. Here are some of the findings from those different regions. Keep in mind that, typically, customers are bringing these devices in because they believe they have issues. You will notice that the numbers are quite high because of this. iOS numbers in Asia are especially elevated—with 76.5 percent of devices tested showing at least one diagnostic issue. We dug into this number and found out what was causing these devices to fail their diagnostic tests. The top three issues were temperature (21.6 percent), headphone (13.6 percent) and battery charging (7.9 percent). Interestingly, Android devices were far less likely to fail their diagnostic tests in Asia, at only 27.4 percent. This is interesting considering Android has a much higher [mobile market share in Asia](#).

Android diagnostic issues rates are also lower than iOS in North America, at 14.4 percent and 19.9 percent, respectively. In Europe, iOS devices are performing a bit better than their competition, at 30.8 percent versus 37.4 percent for Androids.



## **New Features Bring Increased Need for Future-Focused Diagnostics**

Smartphones are getting smarter—and other mobile devices along with them. With new features such as dual SIMs, eSIMs, and fingerprint and facial recognition now available and many others, such as 5G, triple-sensor cameras, Face ID 2 and augmented reality set to hit the scene next year, it's more important than ever that mobile retailers and mobile processors have scalable, future-focused mobile diagnostics testing tools that can keep with the latest developments.

Blancco aims to support these features as soon as they appear (and sometimes before their official launch), ensuring our customers have the tools they need to run comprehensive testing on all devices. Though our Q3 data does not include enough findings to report on these new tests at this time, we expect our future reports will provide more insights on these new features and how they're performing. Of course, our retail customers will likely report these changes first, as the mobile processing market is typically dealing with used devices.

## **Is the Second-hand Mobile Market Ready for a Robotics Revolution?**

There's been a lot of talk in the past couple of years around robotics in the second-hand mobile marketplace. With robotics, mobile processing organizations benefit from a more predictable process and a streamlined approach to mobile device processing. Some companies have even built their own robots to perform automated testing. But in the market at-large, the feature has yet to take off on a grand scale. Our customers tell us that while they are interested in robotics, it still seems to be out of reach for the time being. What is possible is manually augmented automation—software that is still guided by the user but uses automated functions to increase accuracy and speed up processing times.

Blancco puts a large focus on future-proofing our products, and we've added in automation in the way we perform diagnostic tests—making these tests as “touchless” as possible. Our recent Mobile Diagnostics & Erasure release decoupled all diagnostics tested so they could be called individually and help customers support any potential robotics integrations. (This release also improves the speed of tests and allows them to be run in parallel instead of in a series). In short, there are many ways to automate both the mobile diagnostics and mobile erasure processes without integrating with robotics. Take Blancco's Mobile Workflows as an example. This solution allows allow mobile processors to tailor our mobile diagnostics and erasure solutions, including numerous automated capabilities, to perfectly fit their organization's specific needs.

# Conclusion

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As the second-hand mobile market continues to grow and devices continue to evolve, it's more important than ever for mobile processors and retailers to understand how devices are performing across the globe. Once retailers and processors understand how these devices are performing, they can adjust their strategies for improved processing and customer support.

In today's highly competitive mobile marketplace, mobile retailers and processors must deliver maximum value for their customers across every channel— with the goal of optimizing the long-term performance of mobile devices, increasing mobile resale values, reducing the number of customer complaints, the amount of returned devices and the time spent diagnosing and erasing these devices.

To accurately diagnose, erase and support mobile devices on a global scale, mobile organizations need comprehensive mobile diagnostics and erasure solutions with a full set of diagnostics tests and secure, certified erasure methods. To learn more about how you can outpace your mobile competitors by using [Blancco Mobile Solutions](#), contact us today.



# About Blancco

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Blancco is the industry standard in data erasure and mobile device diagnostic. Blancco data erasure solutions provide thousands of organizations with the tools they need to add an additional layer of security to their endpoint security policies through secure erasure of IT assets. All erasures are verified and certified through a tamper-proof audit trail.

Blancco data erasure solutions have been tested, certified, approved and recommended by 15+ governing bodies and leading organizations around the world. No other data erasure software can boast this level of compliance with the rigorous requirements set by government agencies, legal authorities and independent testing laboratories.

Blancco Mobile Diagnostics solutions enable mobile network operators, retailers and call centers to easily, quickly and accurately identify and resolve performance issues on their customers' mobile devices. As a result, mobile retailers can spend less time dealing with technical issues and, in turn, reduce the quantity of NTF returns, save on operational costs and increase customer satisfaction.

Additionally, Blancco Mobile Diagnostic solutions empower mobile processors, 3PLs, Recyclers and Repair & Refurbishment Operations to easily, quickly and accurately process used mobile devices to identify any issues and determine overall value. By incorporating Blancco Mobile Diagnostics, mobile processors automate processes, deliver intelligent routing based on device attributes and increase overall efficiency, while driving incremental revenue and profitability.

For more information, visit our website at [www.blancco.com](http://www.blancco.com).

# Contact Us

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**For Marketing, Please Contact:**

Email: [marketing@blancco.com](mailto:marketing@blancco.com)

**For Corporate Communications & PR, Please Contact:**

Email: [press@blancco.com](mailto:press@blancco.com)