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Upleveling Mobile Device Processing with AI

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In today's challenging and often unpredictable economic landscape, enterprises across all industries are under increasing pressure to streamline and rationalize operations. A shortage of labor and economic challenges have led businesses to seek new and innovative ways to make their processes more efficient. In fact, for the majority of organizations, remaining competitive will likely depend on their ability to strategically automate where possible.



A good example of this can be found in the mobile device refurbishment and repair sector. The market for secondary devices is experiencing tremendous growth. Analyst firm IDC estimates that shipments of used and refurbished smartphones will increase from \$283 million in 2022 to \$413 million in 2026, largely due to the popularity of smartphone trade-in programs.

Managing all these used devices from the point of trade-in to being refurbished and repurposed is a complex operation: devices enter the processing warehouse facility shipped in boxes that need to be opened, and then the devices must be extracted and sorted by make and model. Devices go through cosmetic grading, refurbishment or repair if needed, software loads, dozens of functional and connectivity tests, quality control, kitting (packaging for resale), and then shipping to buyers and new owners. Those that fail the tests or are deemed to have reached the end of life stage are sent for recycling.

Innovative organizations operating in this market are actively investing in automation and robotics, while leveraging artificial intelligence (AI) and machine learning (ML) to improve device cosmetic grading, device diagnostics, and repair. Not only are these advancements speeding up mobile device processing times, but they are also improving accuracy in grading—something that is very important to buyers of repurposed phones.

For instance, in the case of cosmetic grading, the traditional manual approach to this task takes between 30 and 45 seconds per device—valuable time lost when you consider the thousands of devices that need to be processed daily. An automated grading system on the other hand amounts to three to five seconds per device—accelerating the process of preparing them for resale and maximizing customers' profits as a result.

Relatedly, it is vital that the combination of software and hardware solutions work seamlessly when creating an automated testing and grading solution. Both are crucial to improving processing times and grading accuracy.

The key to ensuring trade-in value retention

These time-savings are critical in the secondary device market, where the value of used devices can depreciate relatively quickly. According to industry research, devices depreciate at an average of 1% per week, subject to seasonal cycles. Shortening the time it takes to grade, recondition and resell a used device into new markets is key to protecting its residual value. For operators, OEMs, and retailers offering trade-in services, maximizing device value is critical; it ensures they can offer consumers the best possible price for their device at trade-in, and also drive revenues when re-selling these devices into secondary device markets.

Modularity in end-to-end device processing

When it comes to preparing pre-owned devices to be sold into the secondary market, there are a number of steps that are a critical part of the process: wiping any previously stored user data, checks to ensure the working state of existing components such as screens, Wi-Fi, camera, backlight function, and so on, and the replacement of said components when they are faulty. Add to that the specific requirements of each device trade-in program, which often differ, and the complexity of the process becomes even greater. Modularity is a key advantage to providing the flexibility needed to tailor automated processes to meet varying business needs at scale, and drive cost and production efficiencies.

When applied to the repurposing of mobile devices, a modular design offers flexibility in choosing to configure device processing in the most suitable order—for example, performing data erasure before cosmetic evaluation. This approach allows organizations to support the end-to-end processing of devices, while built-in redundancy means that devices can be processed with little to no downtime. Automation-enabled processing at scale is a means to retaining as much as possible the residual value of the device. Meanwhile, increases in the velocity of device processing allows organizations to optimize performance.

A path to upskilling and workforce development

Automation is opening doors to new, compelling opportunities for many companies and employees. It has great application for repetitive work for which many operations are having difficulty staffing. Businesses from a diverse range of sectors can re-assign employees to different areas of the organization where creative thinking adds value. The long-term implications of this strategy are greater overall productivity and elevated employee satisfaction as workers can move to higher paying positions, acquire more technical skills, and gain more job security. And, as organisations pivot to a more automated model—one which is geared towards scalable efficiency, agility, and innovation—such an approach may be the catalyst for unlocking greater meaning, choice, growth, and autonomy for employees.

An example of this in secondary device processing is the unboxing of millions of traded-in devices that come into a processing facility. Prior to automation this was the type of task that could only be achieved by a team of people, but it is a physically demanding yet monotonous job that carries safety risks. As a result, this type of job is very difficult to recruit for, and staff retention in this area tends to

be low. Through automation, this can now be taken care of by a robot with built-in intelligence to assess the dimensions of every box that enters the processing line. It can then automatically determine the optimal cutting configuration.

Other critical steps where automation may also be applied to relieve operators of simpler and repetitive tasks include device charging, cleaning, debugging, lifting and transporting, cosmetic evaluation, and packing. At nearly every stage of the processing, it is possible to implement automated solutions with a view to redeploying staff to more specialized roles that require human ingenuity, interaction, and the type of business acumen that cannot be replicated by a machine. This translates to higher levels of job satisfaction and creates more opportunities for people to acquire in-demand skills that will help them thrive in a new technological landscape.

Automation in support of data security

As you can imagine, data security is a top priority when it comes to used mobile devices. Automated technology can be used to quickly and securely complete data sanitation of the devices that enter the processing facility. Parallel processing allows for the scaling of the operation so that the resetting of factory defaults, test cycles, and the collection of the resulting feedback can be performed in batches. This provides operators, OEMs, retailers, and consumers with added assurance that data and identity theft is avoided throughout the entire mobile device processing in order to meet data protection requirements.

Enhancing the customer experience

Today, automation is helping to improve the customer experience by giving businesses the ability to respond to queries quicker and more easily address customer queries. For example, a customer may dispute the grading given to their device. Through automated systems, organizations can now have immediate access to real-time data, including AI/ML-driven high-resolution camera photos that can clearly reveal any flaws or other evidence for the grade. Providing more accurate information to customers gives them clearer, more transparent visibility into the process and greater confidence in the objectivity of the grade.

Automation: unlocking sustainable and responsible long-term progress and growth

In addition to creating efficiencies, speeding processing times, and increasing accuracy and consistency in grading, automation is enabling secondary device processors to further contribute to sustainability. Every year, between 50 and 60 million tons of e-waste are generated globally, making e-waste the world's fastest-growing waste problem. To put those numbers into perspective, that's the equivalent of throwing away 1,000 laptops every second for an entire year. In fact, it's estimated that e-waste will surpass 70 million tons annually by 2030, a 100 percent increase over a 16-year period.

The more used devices we can repurpose means less waste that is thrown into landfills. Automation is playing a critical role in repurposing more devices, extending connectivity to more people, and providing a more sustainable environment.