INGRAM MICRO® COMMERCE & LIFECYCLE SERVICES

An Inside Look at the Mobile Device Lifecycle

Indianapolis, Indiana USA Site Visit

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The Ingram Micro distribution center (DC) in Indianapolis, Indiana is a multi-client facility within the 1.8 million square feet of value-added warehousing space in the Indianapolis campus providing third-party logistics services for manufacturers and mobile carriers. Ingram Micro handles one out of three mobile devices in the United States.

Ingram Micro Commerce & Lifecycle Services At-A-Glance

- Sales in 160 Countries Globally
- Reverse and Repair Capabilities in 23 Countries
- 19.6+ Million Square Feet Across 154 Logistics Centers Globally
- Ships 500 Million Units/Year Worldwide
- Authorized Service Provider for 70 Manufacturers Globally
- Six Million Technology Assets Reused and Recycled/Year Worldwide
- Part of the HNA Group, A Global Fortune 500 Company

It is estimated that a mobile device depreciates 3% to 5% every month. The Consumer Technology Association (CTA) reports that the top three most commonly owned consumer tech products are (1) televisions, (2) smartphones and (3) notebooks, laptops or netbooks.

Managing the forward and reverse logistics for a product with a short lifecycle and ever-changing technologies is complex. Ingram Micro provides end-to-end serialized tracking of individual units, proprietary phone support tools (PSTs) and software services (flashing, version updates, pre-programming, and SIM card kitting). Value-added services (VAS) include laser printing of unique identification numbers (UINs), repackaging, kitting, light manufacturing, sub-assembling, re-working, and labeling. Reverse logistics solutions include return, repair, refurbish/recycle and IT asset disposition (ITAD) solutions.

Order Fulfillment

Production Zone AL2 & AL3:

Single item pick, pack and ship

Case Study 1: New Product Introduction (NPI)

Rapid development and deployment in the technology/mobility segment puts pressure on the supply chain to quickly push innovative products to market. It is a delicate balance to manage NPIs while staying on top of existing volume. Once technology and mobile-connected devices are introduced to market, fulfilling orders is a critical step in NPI. Ingram Micro Commerce & Lifecycle Services performs this critical step for 30 Fortune 100 companies.

Ingram Micro Commerce & Lifecycle Services' mobile device NPI operations consist of a pre-order fulfillment phase and an e-commerce fulfillment phase. NPI pre-order fulfillment can generate 10 to 20 times more than the average daily volume. Volume can reach 100,000 orders per day. As pre-order fulfillment orders taper off, e-commerce fulfillment orders start to hit the system. During the e-commerce fulfillment phase, the volume of daily orders can swing from lows of around 20,000 to peaks as high as 400,000. The serial number for each device must be captured and all orders must ship same day, with 100% accuracy.

To meet this incredible challenge, the Ingram Micro leadership team deploys continuous improvement (CI) initiatives to better align daily NPI forecasts with Distribution Center (DC) capacity. Ingram Micro leaders work directly with customers to improve communication to the DC regarding NPI and upcoming promotions. Improved data analytics on the DC side aim to provide more accurate forecasts. As part of the CI initiative, the DC operations team delivers improved packaging for logistics and faster order fulfillment while maintaining the highest quality.

Here are some highlights for each of the four pillars of the CI initiative:

- **Communication:** Ingram Micro and its customers formalize the communication process with cross functional teams. The sales and operations planning (S&OP) process between Ingram Micro and its customers creates a responsive versus reactive continuous flow of order fulfillment.
- **Packaging:** Ingram Micro's engineers work with customers to design packaging that eliminates dunnage while ensuring the product is not damaged while in transit. Additionally, eliminating excess packing materials reduces shipping costs and increases order fulfillment productivity.
- **Speed:** Ingram Micro engineers a Hot Zone in the warehouse to manage the NPI volume. NPI goods move to the Hot Zone, are slotted in bin locations and allocated for picking. Additionally, the Hot Zone reduces travel and bottlenecking in the warehouse.
- **Quality:** The Hot Zone's purpose is to ensure 100% accuracy on every device shipped. The picking process and technology are a combination of pick-to-light with radio frequency (RF) scanning of each unit. Additionally, each shipment is weighed prior to shipping with a tight weight-out-of-tolerance (WOOT) variance standard.

Hot Zone

The Hot Zone is set up away from the traditional pick and pack area so several pickers can be positioned to pick the product allowing a continuous flow of goods from pick to ship.

The Distribution Center Hot Zone solution leverages technology to meet the complexity and volume challenges characteristic of NPIs.

Case Study 2: Special Service Requests (SSRs)

High-tech electronic devices with a short product lifecycle and emerging technology are perfect for product mass customization and/or postponement at the Distribution Center. Ingram Micro developed and deployed an agile and cost effective SSR program to meet its customers' supply chain strategy. The SSR program allows customers to postpone product customization or configuration as late in the supply chain as possible. The customer can then offer more product variations with complex configurations, which in turn helps keep inventory low.

The SSR Process: The customer submits a scope of work (SOW) document to Ingram Micro. The SSR SOW is routed through operations, then to the on-site Industrial Engineering team. Once the Finance Department approves the resources needed to complete the SSR, Operations coordinates the deployment of the SSR with the customer.

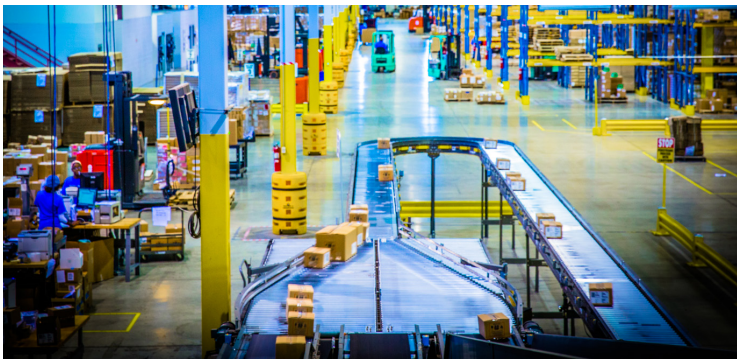
SSRs typically take 24 hours to validate engineering, confirm pricing, and ensure all bills of materials (BOMs) are available to deploy the SSR. The customer receives a run-sample of the finished product/kit and cost per kit, device, unit or finished good for approval along with documentation of the process steps with cycle time and photos..

Once the SSR is deployed to production, Ingram Micro measures the results daily and fine-tunes the process where needed to ensure on-time completion and on-budget execution at the defined standard of quality. Fast, efficient and cost effective...with no hidden fees.

Elements of the SSR include laser printing of UINs, re-packaging, kitting, light manufacturing, sub-assembling, re-working, re-packaging and labeling.

SSR production cells where more complex SSRs are performed. These cells are fully equipped with product location bins, computers, printers and supplies.

SSR linear production, line kitting. Cycle time and takt time are managed for each production line. The linear SSR project is predictable and repeatable.



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Technological SSRs include proprietary PSTs and software services for flashing, version updates, re-programming the consumer's device, and SIM card kitting.

Case Study 3: Reverse Logistics

Almost as quickly as cell phones and mobile devices hit the retail channels, older models enter the reverse supply chain lifecycle stage. Consumers may return devices for repair or as trade-ins towards the purchase of new devices.

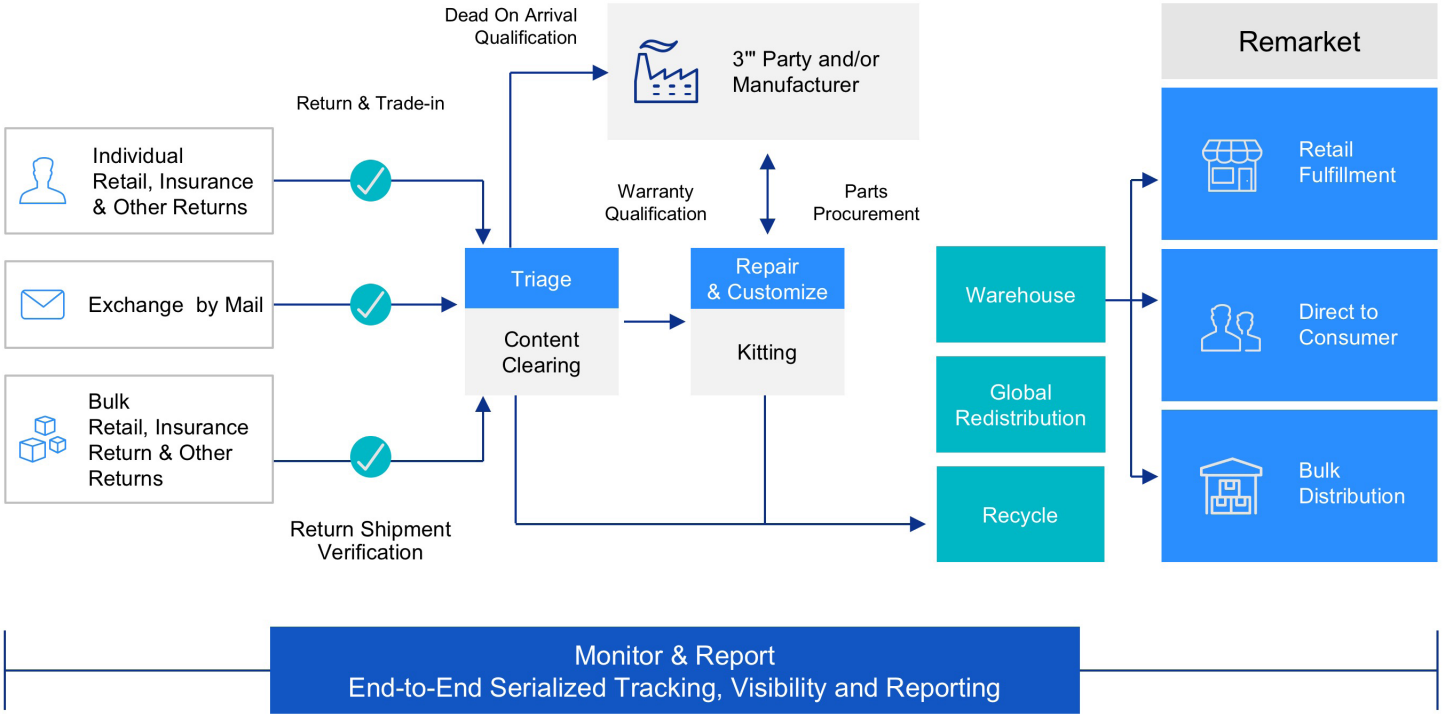
In either case, Ingram Micro conducts an initial evaluation triage on each return to determine whether the product can be refurbished and resold or if it must be recycled.

Ingram Micro manages reverse logistics services for products such as cell phones, multimedia gadgets, digital cameras, music players, wearables (wrist bands, watches and glasses), GPS systems, and just about anything electronic and mobile.

Customers consign products to Ingram Micro to enable reverse logistics services. Services may include testing and flashing of the unit with software updates, sampling, repair, disassembly, reassembly, reclamation or recycling. Ingram Micro manages the parts inventory/supply chain from procurement to completion of the reverse logistics services. Ingram Micro's reverse logistics services add value by extending the lifecycle of products and returning products to consumer channels as quickly as possible.

Data collection and retention are critical. Ingram Micro's Fusion software allows end-to-end tracking of phones and/or components throughout the entire lifecycle. Furthermore, the big data captured by Ingram Micro in the reverse cycle is used for forecasting replacement parts needs and helps the original equipment manufacturers (OEMs) better understand why products are being returned.

Site certifications, quality: Reverse logistics for electronics requires rigorous certifications for responsible recycling. The R2 Certification establishes requirements to handle electronic waste responsibly.



What's In Ingram Micro Commerce & Lifecycle Services' Future?

Ingram Micro Commerce & Lifecycle Services continues to invest in global expansion, infrastructure, automation and business intelligence. Along with Forward and Reverse Logistics Services, Ingram Micro has continued to expand its enterprise IT Asset Disposition Services to provide flexible, secure and compliant data destruction, remarketing, and recycling services for end-of-life assets to better serve its customers' entire product lifecycle.

Ingram Micro also continues expanding into new regions based on customer needs. A good example of such services is Ingram Micro's remanufacturing services in Costa Rica. In Costa Rica, mobile device remanufacturing occurs within a Free Trade Zone providing a number of tax exemptions, including exports. While exporting the product from the U.S. to another country may seem time consuming, the transit time for this service is only 2.5 days, including customs clearance from our facility in Fort Worth, Texas.

The challenges facing companies in the consumer electronics space - and particularly mobility companies - include increasing Average Selling Prices (ASP) and longer product lifespans. Ingram Micro Commerce & Lifecycle Services addresses theses challenges by providing insights and driving efficiencies that are critical to client success.

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