Computer Parts Suppliers Can Find Efficiency and Savings Through a Logistics Upgrade

Purolator International

Introduction

To understand what's driving the global computer industry, consider one key fact: personal computer (PC) ownership – including desktop and laptop models – is declining as a growing number of consumers turn to their mobile devices as their primary method of Internet access. Among millennials, for example, 20 percent of respondents to a comScore survey indicated they no longer use desktops and are entirely reliant on their mobile devices. This has resulted in a highly competitive environment, with manufacturers under constant pressure to "lure customers back" with more innovative operating systems and features at competitive price points.

According to International Data Corporation (IDC) market research firm, shipments of PCs dropped 5.7 percent during 2016 to 260 million units. Among the industry leaders:

	2016 Units Shipped	Increase/Decrease from 2015	Market Share
Lenovo (China)	55.5 million	-3 percent	21.3 percent
Hewlett Packard, Inc. (U.S.)	54.2 million	+1.3 percent	21 percent
Dell Technologies (U.S.)	40.7 million	+4.3 percent	14 percent
ASUS (Taiwan)	19.2 million	-0.8 percent	7 percent
Apple (U.S.)	18.4 million	-10 percent	7.4 percent

But, in a sign of just how competitive the industry is, Hewlett Packard claimed the number one ranking from Lenovo in July 2017, when market research company Gartner, Inc., reported a 20.8 percent market share increase for Hewlett Packard during the second quarter of 2017, while Lenovo shipments fell by 8.4 percent.

Important to note, PC sales have shown significant growth in two key sectors: PC gaming and educational sales. Although a small part of the overall PC industry, high-end gaming consoles are estimated to be growing by as much as 25 percent annually. With regard to education, sales of low-cost Chromebook laptops have soared over the past five years and today account for more than half the devices shipped to schools.

But aside from these two niche categories, why are sales declining? Gartner research cites several reasons:

- Insufficient technology improvements to drive real market growth
- Increased dependency on mobile devices, causing consumers to delay purchases of newer model PCs
- Consumers seeking "fresher experiences and applications in emerging categories, such as head-mounted displays, virtual personal assistant speakers, and wearables"
- Lack of demand in emerging markets, as consumers tend to rely on smartphones and tablets rather than PCs for their computing needs

It seems, then, that consumers who reliably upgraded their PCs to benefit from faster processors or greater memory capacity no longer prioritize having the latest and greatest. Or maybe the industry's "latest and greatest" isn't enough to compel consumers to invest in new equipment. According to Intel Chief Executive Officer Brian Krzanich, the replacement cycle for PCs is now roughly five to six years, whereas it used to be every four years. "Right now it's easier to move your phone to a new phone than your PC to a

new PC," the chipmaker CEO said at a 2016 analyst meeting.

Sales of PCs have dropped as consumers prefer to use mobile devices for Internet access.

Even the previously reliable business computer market has undergone a sea change, as companies that used to place regular orders for hundreds, if not thousands, of identical desktops have adopted new buying models. "One company may have a fleet of iPads for its sales-people to show coming shoe designs to clients, and conventional desktop PCs for its workers at the home office," the *Wall Street Journal* reported. "Others are buying stripped-down laptops that rely mostly on connections to corporate networks via the Internet. And a small number of businesses are letting the employees decide what kinds of computers work best for their jobs."

As manufacturers battle for dominance in the shrinking PC sector, the need for supply chain efficiency has become a key focus, as companies face global operations, tremendous pressure for innovation, consumer responsiveness, and price efficiency.

And it would seem the industry leaders are doing something right, with two of the top five manufacturers included in the 2017 Gartner Top 25 Supply Chain listing (Hewlett Packard is #19 and Lenovo is #24) and a third, Apple, achieving "supply chain master" status for having scored among the top five companies in at least seven of the last ten years.

In looking at these companies' supply chains, several common "best practices" are evident:

- Laser-like focus on customer satisfaction and meeting customer preferences
- Streamlined processes to eliminate redundancy, add visibility across the organization, and improve efficiency
- High standards and accountability for all external vendors
- Heightened focus on manufacturing excellence with prioritization on inventory management and logistics efficiency
- Worldwide manufacturing facilities that cater to global consumer bases
- Sensitivity and commitment to the communities where facilities are located.

The following discussion will focus on these and other trends driving the global PC industry, with special attention on the critical role suppliers have in helping manufacturers meet their objectives. As the discussion will make clear, manufacturers have set strong expectations for their suppliers, with little tolerance for late, damaged, or incomplete deliveries. This in turn heightens the need for suppliers to ensure its logistics strategy can accommodate the unforgiving demands of today's manufacturers' supply chains. For many suppliers, the ideal solution has been an expedited logistics strategy, which offers guaranteed fast delivery with premium levels of handling, security, and customer service.

Industry Overview: Continual Focus on the Next Big Thing

When sales of Apple's iMac desktops and MacBook laptops fell by more than 10 percent during 2016, industry watchers were quick to blame the company's failure to offer any upgrades, or "wow" factors, to entice customers. "Apple's disgracefully outdated Mac lineup is killing sales," read one headline in technology news website ZDNet.com. The article listed the amount of time that had elapsed since Apple's computer lines had been updated:

- MacBook – 177 days
- iMac – 366 days
- Retina MacBook Pro – 513 days
- MacBook Air – 584 days
- Mac mini – 728 days
- Mac Pro – 1,029 days
- MacBook Pro – 1,584 days

"Apart from the MacBook, there's nothing in Apple's computer range that I'd recommend buying right now," the author wrote. "Everything is either old and crusty (5k iMac), or very old and crusty (Mac Pro), and you'll be throwing away top dollar for technology that is, by the standards of the fast-moving tech industry, ancient."

Apple saw a rebound in PC sales following a 2017 upgrade of its Mac Pro line.

The company did announce an "update" to its Mac Pro line in April 2017, which resulted in different configurations and pricing strategies. While a complete overhaul of the line is expected, the short-term tweaks were apparently enough to encourage consumers to buy, as sales of Apple computers rose by 6.7 percent during the second quarter.

But during the period in which Apple failed to announce any significant upgrades, competitors were ready to pick up the slack with new devices.

Microsoft, for example, claims many disappointed Apple customers switched to its Surface Studio PC, which *Wired* calls a "gorgeous" 28-inch all-in-one desktop that flattens out into a digital drafting table and runs on the Windows operating system. "If Microsoft succeeds, it'll be because Surface Studio truly is an innovative device – but even more so because Apple gave the competition a golden opportunity."

However, sales of the Surface line of laptops, desktops, and tablets apparently have yet to meet expectations, with industry daily newspaper *DigiTimes* reporting that orders have fallen short of expectations. The paper noted demand for the Surface brand has "been seriously undermined by other first-tier vendors' similar devices."

Among those devices, Lenovo's Yoga laptop, priced to compete in the "premium" category with Apple, currently accounts for more than 40 percent of the market in the $900-and-above price band, according to company Chairman Yang Yuanqing. Speaking in an interview with McKinsey consultants, Yuanqing added: "It's been a huge, huge success. And it's not only helped us to grow our volume and market share, but also to build our brand. It has repositioned us as a brand known for innovation."

Lenovo's Yoga laptop accounts for more than 40 percent of the market in the $900-and-above price band, according to company Chairman Yang Yuanqing.

Further, when asked how his company, which until 2005 was little known outside of China, was able to surpass such dominant players as Hewlett Packard, Apple, and Dell to gain the number one ranking, Yuanqing spoke about his company's success at forecasting consumer demand and its prioritization of research and development (R&D).

"R&D is critical because we must consider the whole package: hardware, software, services, and content. That is how you give customers the best user experience and rich applications," Yanqing said. "Our belief is that if you want to be the most innovative, you must leverage the best talent. And that talent and new technology come from everywhere, and different countries and different markets have different demands and requirements. So having global R&D centers is very important."

And what can consumers expect from manufacturers' commitment to R&D? Many analysts have given "next big thing" status to 2-in-1 PCs, which offer both tablet convenience and a fully operational PC within the same product. As one industry analyst noted: "These smaller combination devices are ultra-portable with generally exceptional battery life yet will often equal their big brothers in terms of performance."

Other PC innovations include:

- Desktop computers that feature curved screens, which is a key feature of the HP Envy 34. According to the *Wall Street Journal*, "the striking HP Envy is like having your own desktop IMAX theater."
- "Swivel" screens that allow the user to better position the screen for easy access. This is a key feature of both the Microsoft Surface Studio, which is intended for artists, and the Dell XPS 27, designed for home offices and dorm rooms.
- Down the road, Gartner expects functions including 3D scanning and printing, voice recognition, motion sensor, and holography.

As manufacturers battle for dominance in the declining personal computer sector, it's clear that innovation – along with a clear "cool factor" – will be one of the most important tools in their arsenal. Manufacturers understand the need to provide consumers with a reason to choose their product, and in the crowded PC category, consumers will reward companies that invest time and resources in developing products that provide an ideal experience and help facilitate their computing needs.

PC Customer Expectations Drive Industry Priorities

Hewlett Packard vice president and head of supply chain operations for EMEA Volker Schmitz spoke with *Supply Chain Digital* recently and noted the role customers have in shaping supply chain decisions. "Firstly, our supply chain is important for our customers," he said. "The way we interact with customers, and take, update on, and deliver orders is driving customer satisfaction." Schmitz expressed his personal mission, which is to "go above and beyond for customers, delivering a competitive advantage for HP's business and its partners."

As this statement suggests, the computer industry is not immune from consumer-driven changes taking place across the consumer retail environment. Businesses have had to adapt to a "new normal" in which consumers are firmly in control, with strong expectations for increasingly innovative products available through highly convenient and flexible multi-channel shopping experiences.

Consumers have never had more choices in selecting the PC that best meets their needs and expect companies to go the extra mile in adding new features and efficiencies.

Within the personal computer industry, this has manifested itself in several ways. Consumers have never had more choices in selecting the PC that best meets their needs and expect companies to go the extra mile in adding new features and efficiencies. Key considerations prioritized by PC consumers include:

Functionality

The 2016 American Customer Satisfaction Index, not surprisingly, found strong consumer opinions about PC functionality:

Feature	Score (Based on 0-100 scale)
Design (size, visual appeal)	84
Graphics and sound quality	81
Ease of operation (navigation, settings, touchscreen, mouse)	80
Availability of software or apps	82
Availability of accessories (chargers, adapters, printers, game controllers)	82
Ability to keep system crashes to a minimum	79
Features (operating system, preloaded software, memory)	77
Processor speed	79
Website satisfaction	78
Call center satisfaction	70

Customization

Consumers expect to be able to "build" their own system based on preferences in key areas, including screen size, memory, processor, storage, software preferences, and even the color of the monitor casing.

This preference for customization is not unique to computers. Deloitte research found customization to be a competitive factor, with businesses that do not offer an element of personalization at risk of losing revenue and customer loyalty. The Deloitte analysis also found many businesses are

postponing production until the latest point possible to allow individual customization, which can have the added benefit of helping to reduce inventory levels and increase efficiency.

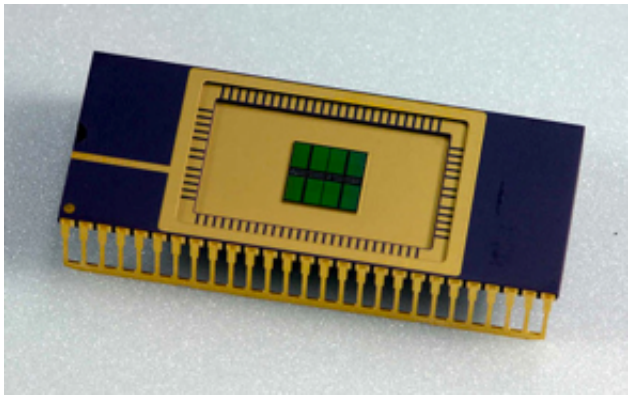
Competitive Pricing

Not only must manufacturers try to win the battle for design, battery life, screen appearance, and any number of other performance features, but they must deliver their innovative new products at increasingly competitive price points.

But, given manufacturers' reliance on suppliers for vital components, pricing can often be difficult to control. For example, in analyzing ongoing decline in PC sales, *MarketWatch* cited increased computer prices, caused by "higher prices for certain components, namely memory chips" as a contributing factor.

Although manufacturers have been largely prevented from passing along the component prices to business customers, due to existing contracts, consumers have seen higher prices and have pushed back. "In the consumer market, the price hike has a greater impact as buying habits are more sensitive to price increases," Gartner analyst Mikako Kitagawa told *MarketWatch*. "Many consumers are willing to postpone their purchases until the price pressure eases."

Shortages in key components, including DRAM chips, have caused PC manufacturers to raise prices.



Kitagawa estimates prices have increased by as much as 10 percent versus 2016 levels.

In response to consumers' pushback, some manufacturers have tried to control costs by using less costly configurations. This includes adding less memory, stripping down the specifications of the system, and instead installing smaller amounts of DRAM at prices that would have covered larger amounts in the past.

Or, according to *Computerworld*, some consumers are choosing to buy additional components on their own in response to manufacturers' practices of limiting customization to control PC pricing.

Company Name	Overall (100)	Web Score (60)	Phone Score (40)	Average Call Time
Apple	93	56	37	6:00
Acer	88	50	38	8:36
Lenovo	86	50	36	11:57
Microsoft	82	48	34	21:20
HP	80	45	35	27:00

Customer Service

A review by LaptopMag.com of Dell's 2017 laptop lineup had generally strong comments about the company's latest offerings, using phrases including "drool-worthy" displays, "comfortable keyboards," and "wonderful build quality." But when it came to customer service, the review turned decidedly less positive. The company's "mediocre tech support" was cited as a main weakness. "Support reps didn't know basic information about the company's preloaded software and kept us on hold for a long time," the review stated.

In fact, *Laptop Mag* publishes an annual ranking of manufacturers' customer service capabilities, which for 2017 placed Apple at the top of its list.

Apple's dominance was also affirmed by *Consumer Reports*, which surveyed 3,200 consumers and found that "Mac users gave Apple's phone and online support glowing reviews, and four out of five said tech support was able to resolve their problem." Apple's high marks stood out against other manufacturers included in the study, which consumers gave just "a 50-50 chance" of being able to solve a consumer's PC issue.

Fast and knowledgeable tech support is an integral part of the customer experience. If a manufacturer has any doubt about this, a quick review of customer comments posted to industry-related websites will provide ample proof. Keep in mind: Satisfied customers tell three friends, while angry customers tell 3,000.

Computer Suppliers – Vital to Manufacturer Success and Customer Satisfaction

From the earliest days of the PC industry – which only dates back to 1975 – manufacturers have understood the vital role of suppliers and have largely taken steps to build positive, mutually beneficial working relationships. An obvious example is the relationship that exists today between Apple and its largest supplier Foxconn, the Taiwan-based contract manufacturing company that produces products including the iPhone, iMac, and iPad. "From a strategic point of view," an article in *The Economist* noted, "the partnership could not be more successful," pointing out the billions of dollars the supplier has invested in building capacity across China – and more recently in the United States – to meet Apple's production needs.

Taiwan-based Foxconn, the world's largest electronics contract manufacturer, is Apple's largest supplier.

However, Foxconn is not an exclusive supplier to Apple, with contracts to provide assembly services for Hewlett Packard, Dell, and Acer. Foxconn also manufactures gaming consoles for Microsoft, Nintendo, and Sony, according to *MacWorld*.

This shared supplier reality is highlighted in Dell's overview of its supply chain: "Today's supply chains are a complex web of interconnected companies, and in the technology industry especially, we often share suppliers with competitors," the company's website reads.

Global Manufacturing and Distribution Networks

With few exceptions, supplier networks accommodate a global network of manufacturing and distribution facilities. Dell, for example, maintains 25 manufacturing locations, with more than 40 distribution and configuration centers and 900 parts distribution centers globally.

Hewlett Packard maintains a similarly extensive network. As *Supply Chain Digital* reports: "Orders are manufactured by a network of factories across the world, with the company's largest factory base being in Asia. Regional factories nearer to key customers handle more specific, complex requirements. Distribution is handled through a network of distribution hubs and subcontracted logistics activities."

At China-based Lenovo, the company's global supply chain – with operations in more than 60 countries – relies on what *Forbes* refers to as a "revamped" supply chain that has come about following acquisitions of IBM's personal computer business, IBM's Intel-based server business, and Motorola Mobility. "As a result of such bold moves," the article states, Lenovo has had to adapt to an increasingly global marketplace and a growing list of international standards and regulations.

Further, a growing trend among manufacturers is the return of at least some manufacturing to the United States and internalized production that was previously outsourced. Apple operates a manufacturing center in Austin, TX, where its Mac Pro desktop line is assembled, while Lenovo's ThinkPad and ThinkCentre computers are assembled at its Whitsett, NC, facility.

While these products may be assembled in the United States, most of the internal components and hardware come from suppliers located all over the world, mostly China and other Asian countries. And while some suppliers have shifted at least a portion of their manufacturing to the United States, there is little speculation that any major shift away from Asia is afoot.

In the chip industry, for example, the *New York Times* reports that while U.S.-based companies, including Intel and Micron Technology, dominate chip sales worldwide, only about 13 percent of manufacturing occurs in this country, down from

30 percent in 1990. "Foreign countries have become more appealing for chip manufacturers, in part, because of the rise of contract chip foundries owned by Samsung of South Korea and Taiwan Semiconductor Manufacturing Company. They have made it easier for American tech companies to design cutting-edge chips in the United States but outsource production to Asia."

PC suppliers are affected by the globalized market in two key ways: (1) products must be designed in a way that meets language, cultural, and regulatory issues associated with each country in which it is sold; and (2) managers face logistical obstacles associated with supply chains that can span several continents, multiple time zones, and dozens of languages.

Moving product across the globe triggers an array of logistical challenges. Overcoming obstacles created by weather events, political turmoil, or poor infrastructure can severely hamper a scheduled delivery, as can a poorly managed customs compliance border process.

Seamless customs clearance is an important consideration for any international PC parts supplier.

A supplier must ensure that shipments crossing international borders have all customs documentation pre-filed, have all duties and taxes prepaid, and face minimal risk of delay. This is most often accomplished by entrusting the customs clearance process to an experienced logistics provider or customs agent. But even then, a supplier must be careful to enlist a third party with demonstrable experience. Having a shipment delayed – or denied entry – at the border can wreak havoc with a PC manufacturer's supply chain, and no supplier wants to be the reason for manufacturing delays.

Continual Improvement

As computer makers face the reality of a declining market, suppliers find themselves tasked with developing "the next big thing" to lure consumers into making a new computer purchase. Innovation can take many forms in PC design, ranging from a super-thin laptop, to better battery performance, to improved memory and faster processing. Integral to any innovation is a supplier's ability to bring the innovation to market as quickly as possible and in sufficient quantity to meet demand.

With regard to chips, which of course are vital PC components, Accenture reports the typical semiconductor development cycle is roughly six months, which has become untenable in today's environment. "The inescapable conclusion is that current semiconductor supply chains are too slow," the report states. "A six-month development cycle for a new semiconductor risks becoming a serious critical-path constraint on a device whose entire delivery cycle is shorter than that time frame."

Currently, the PC industry is suffering the effects of suppliers unable to meet demand. A worldwide shortage of DRAM (allows PC to perform multiple tasks simultaneously) and NAND (long-term data storage) chips has driven up the price of the components and caused industry-wide production delays. A report by *9to5 Mac* cited production of Apple's iPhone 8 as a key reason for the shortage. "Analysts estimate that Apple buys up around 18 percent of the world supply of NAND chips, and that this percentage could increase significantly if the iPhone 8 is a success." Further, the report noted, while suppliers work to alleviate the shortage, long lead times mean that demand is expected to exceed supply until well into 2018.

eCommerce Fulfillment

Suppliers must also contend with the increased role of eCommerce. According to *eMarketer*, the "computer & consumer electronics" category is the leading source of Internet sales and expected to account for more than 22 percent of all online sales in 2018, with a value in excess of $108 billion.

For parts suppliers, this means having an efficient strategy in place both to meet fulfillment demands of PC manufacturers as well as online parts orders placed by consumers and businesses. Dell, for example, promises customers to have their "customized" PCs shipped within 24 hours of order placement. Fulfilling this promise means every required part must be either on-site or easily accessible.

PC suppliers must adapt eCommerce strategies to align with consumer expectations for innovation and flexibility.

With regard to online sales to consumers, suppliers are adjusting to growing customer fulfillment expectations. According to research by Deloitte, consumers increasingly expect delivery of online orders within two days, and they also expect free shipping.

In addition, consumers expect increasingly innovative options when purchasing online. Parts suppliers and manufacturers are responding with convenience-based services, including Hewlett Packard's "Instant Ink" service, whereby certain lines of inkjet printers include "smart" ink cartridges that can automatically reorder ink as needed.

Shipment Safety and Security

With so much at stake, it is not surprising that supply chain security is a major concern both for PC manufacturers and suppliers. Shipments are at risk both for theft and damage during the logistics and transportation process. According to research from CargoNet, electronics shipments – including PCs and laptops – valued at more than $45 million were stolen during 2016. Electronics shipments account for the second-highest incidence of theft, behind food and beverage shipments.

The good news is the incidence of cargo theft has declined in recent years due largely to improved warehouse and truck security systems. However, shippers must ensure that their logistics provider has upgraded its security protocols to include state-of-the-art technology-based systems.

Expedited Logistics Strategies Help Suppliers Meet Changing Demands

Faced with so many competing challenges – speed, efficiency, and global customer and supplier bases – suppliers have recognized the urgent need to reassess current practices and adapt innovative, technology-driven supply chain solutions. For many businesses, a smart choice has been to enlist the services of an expedited logistics provider. A qualified expedited provider can assume complete responsibility for all logistics needs and free up managers to focus on other aspects of their business.

While historically the expedited category was used primarily for critical, extremely time-sensitive or highly fragile shipments, a growing number of businesses are turning to expedited as a solution for "regular" shipping needs. In general, businesses find the efficiency and guaranteed service inherent to expedited services can largely offset the service's higher costs.

With regard to PC parts suppliers, efficiency and better management can be found in several important categories:

Speed to Market. Component makers – especially chipmakers – are under constant pressure to shave days – or even months – from their lead times. And as the current chip shortage demonstrates, failure to meet demand can have severe consequences.

An expedited solution will address the need for improved speed to market in several ways:

- Streamlined solution in which all supply chain services are performed – or managed – by the same logistics provider
- Personalized attention to detail through which logistics. personnel will develop a customized solution to achieve specific manufacturing and distribution needs. Those same individuals will then manage the project, ensure all deadlines are met, and keep all key players informed.
- High degree of flexibility to adapt to changing market conditions and unanticipated challenges.
- Integration of technology and automation to improve visibility, thereby reducing risk of disruption.
- Full suite of transportation options ranging from next-flight-out to charter services to expedited ground solutions.

Globalization Issues. An expedited logistics provider will offer hassle-free service across international boundaries and seamless clearance through local customs processes. At a minimum, a qualified logistics provider will ensure an expedited shipment arrives at a customs checkpoint with all paperwork completed and, where possible, already pre-filed. All taxes/duties/fees will be paid in advance, and the shipment will be in compliance with all security and "other government department" mandates.

A truly exceptional logistics provider will go beyond this and offer innovative services that may include:

- **Use of regional airports.** Extremely busy airports can be avoided by rerouting a shipment to travel via a less-busy alternative.
- **Maximal use of "customs-friendly" countries.** Some countries are notoriously inefficient at clearing shipments through customs, while others can move shipments quickly. A savvy logistics provider will be able to plan a logistics route that avoids likely difficult customs procedures.
- **Local couriers.** A qualified provider will have local personnel on the ground ready to oversee the proper handling of a shipment. Local personnel will speak the local language and be fully aware of airport logistics, customs processes, and even local ground options. In some instances, the local agent will accompany the shipment to its final destination.

Inventory Management. As reported by the *Wall Street Journal*, Apple CEO Tim Cook has expressed very strong thoughts about inventory management: "Inventory is fundamentally evil," he reportedly said. "You kind of want to manage it like you're in the dairy business. If it gets past its freshness date, you have a problem."

This attitude no doubt influenced the lean inventory management techniques in place at Apple, which have helped the company attain "hall of fame" status in Gartner's annual list of "best supply chains." Essentially, Cook has overseen a streamlining of Apple's inventory processes by reducing the number of core suppliers and reducing the number of warehouses to limit overstocking. In addition, the company relies on complex forecasting models to limit stock on hand to only six days.

"Inventory is fundamentally evil," according to Apple CEO Tim Cook, as reported in the *Wall Street Journal.*

Similar models are in place elsewhere in the industry. Dell, for example, which pioneered the concept of "built to order" computers, at one time maintained inventory levels of four days or less, an accomplishment the *Wall Street Journal* says "has become a pillar of supply-chain education."

The precision-like timing of the PC manufacturing process requires a finely tuned supplier network that can meet those rigid demands. An expedited logistics plan allows a supplier full visibility into global inventory levels and the capability to move supplies accordingly. Alternatively, a non-expedited solution would house inventory in warehouses or distribution centers that could potentially be located thousands of miles – or continents – away from where it is needed.

An Innovative Logistics Provider is Integral to Success

To meet the challenges of today's PC manufacturing environment, suppliers are turning to their logistics providers as never before to assume greater responsibility and develop increasingly out-of-the box innovative solutions. Today, logistics partners have a seat at the table and a voice in helping businesses address their supply chain challenges.

The first step is to identify the right provider. A fair amount of research will be necessary to ensure that a logistics partner has the required capability and experience. Key considerations to keep in mind when choosing a qualified logistics provider include:

Technology-Based. Technology has changed EVERYTHING when it comes to logistics and transportation solutions. As a result, providers are able to offer solutions that were unthinkable a few years ago. Make sure any potential logistics provider has not only invested in technology – and in regular upgrades – but that it has technology-savvy staff who understand the system and can ensure maximum benefit.

Wide Scope of Solutions. Are you aware that it is possible to have a ground shipment delivered to Canada faster than some transportation providers' air solutions? This is one example of how innovative logistics providers are thinking out of the box and developing innovative solutions. Today, it is possible to have a "customized-like" solution for almost every shipment. Long gone are the days when a transportation company would offer a single "take it or leave it" approach. Choose a carrier with a menu full of options and a "sky's the limit" approach to helping address your company's precise needs.

Distribution Network. Make sure your provider has a distribution network in place that meets all your coverage needs. If your supply chain includes suppliers or customers in Asia, for example, make sure your provider offers coverage to the precise locations your shipments need to go. Or, if your shipments would benefit from an intermodal air/ground solution, make sure your carrier has access to the right equipment.

Flexibility. You will also want a logistics partner that can be flexible and will adjust service to meet your specific needs. The PC industry tends to see peak periods during the holiday and back-to-school seasons, with suppliers often challenged to provide necessary components in time to meet hectic production cycles. An experienced provider will guarantee required services during peak times, as well as during the less busy seasons.

Continual Improvement. You will want a partner that constantly monitors your account and looks for new and better service options. Too many logistics partners forget about their customers after the contract is signed and businesses find themselves locked in to certain service levels, even if a better option becomes available. You want a partner that is invested in your success and offers ongoing recommendations for service improvements.

Customs Expertise. The PC supply chain is truly global, with components sourced all over the world and assembly at a facility that could be located anywhere from Texas to China. Clearly there is no room for a shipment to be held at the border because of missing documentation or due to some other mistake. Make certain your logistics partner has a proven track record managing the international customs process. A truly experienced provider will ensure shipments arrive at the border with all documentation pre-filed, with the correct tariff classification assigned, with all duties and taxes paid, and with a determination of any free trade benefit eligibility.

Customer Service. Your logistics provider must take seriously your commitment to your customers. A good logistics provider will have staff dedicated to your business, who understands your objectives, and who can advise how best to meet those goals. Equally important, a customer service representative must be easily accessible should something go awry or a last-minute change become necessary.

Conclusion

When Hewlett Packard's EMEA supply chain director Volker Schmitz talks about the overall scope of his company's operations, he likes to focus on what happens in the EMEA region in a single minute: "Every 60 seconds the company ships 35 PCs, 26 printers, and 280 ink and toner cartridges into more than 100 countries in Europe, Middle East, and Africa – a supply chain that does not sleep," he said in an interview with *Supply Chain Digital*.

To accomplish this, the computer giant relies on a well-orchestrated supply chain that involves hundreds of suppliers that are entrusted to deliver needed supplies at the right location – which could be anywhere in the world – at precisely the right time.

As manufacturing processes have become more automated and technology-driven, suppliers are under increasing pressure to keep pace, both in terms of production volume and delivery efficiency. But, as the current worldwide chip shortage demonstrates, sometimes even the most advanced supply chains can have trouble meeting these demands. Having access to a best-in-class logistics provider can help minimize the impact of any delays. In fact, in today's high-pressure manufacturing environment, most suppliers understand that an experienced partner is indispensable when it comes to ensuring a high-functioning supply chain.

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Purolator is the best-kept secret among leading U.S. companies who need reliable, efficient, and cost-effective shipping to Canada. We deliver unsurpassed Canadian expertise because of our Canadian roots, U.S. reach, and exclusive focus on cross-border shipping.

Every day, Purolator delivers more than 1,000,000 packages. With the largest dedicated air fleet and ground network, including hybrid vehicles, and more guaranteed delivery points in Canada than anyone else, we are part of the fifth-largest postal organization in the world.

But size alone doesn't make Purolator different. We also understand that the needs of no two customers are the same. We can design the right mix of proprietary services that will make your shipments to Canada hassle-free at every point in the supply chain.

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