How a Digital Storm Will Disrupt the Parcel and Express Industry
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How a Digital Storm Will Disrupt the Parcel and Express Industry

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A new wave of digitization, with artificial intelligence, cloud-based analytics, modular software, autonomous vehicles, and other innovations, is laying the groundwork for five major disruptions in the parcel and express industry. These disruptions will likely erode the competitive advantages enjoyed by incumbents.

**Five Potential Disruptions**

First, an explosion of e-commerce reduces the advantage of delivery density and creates openings in B2C for global integrators, e-tailers, and food retailers. Second, driverless technology makes line-haul routes cheaper with smaller trucks than with today’s human-driven big trucks. Third, various last-mile innovations reduce the need for local drop density while increasing the need for global scale. Fourth, big data analytics and consumer centricity enable first movers to build deep relationships with end users, increasing market share and cutting costs. Finally, platform orchestrators break up the value chain into separate commodity markets.

**The Need for Transformation**

Established companies can still prevail, but only if they move soon to fundamentally change their business and operating models. They must become receiver-driven, asset-light, and technology-based service providers.
It’s the year 2026, and you’ve just emerged from a tough earnings call with analysts. Revenue was down by 10%, and profits fell twice that. You tried to pin the blame on e-tailers’ price promotions for their delivery options, but the analysts didn’t buy it. They said you would just have to get used to fighting for share against these new rivals with all their momentum and tech buzz. What a come-down from the giant enterprise you remember only a decade ago. You shake your head and wonder, What happened to my industry? Digitization used to be a good thing!

It may be hard for executives in parcel and express delivery to imagine this scenario. Business is solid, with stable revenue in B2B and rising volume in B2C. The established companies—global integrators, postal companies, and regional deferred deliverers—all have formidable sources of competitive advantage, such as strong logistical networks and high-density distribution. They’ve spent decades building highly efficient operations and dominant market share. All of these assets provide them with well-protected strategic positions.

Yes, the news reports talk about delivery robots, driverless trucks, data-driven customer familiarity, and other amazing digital innovations. But these are individual trends that will benefit all delivery companies equally; how could they bring on a paradigm shift in the industry as a whole?

The answer is that these digital advances won’t just boost efficiency. They’ll also change the fundamental sources of competitive advantage, because they will not benefit all delivery companies equally. Unless the established companies adjust their strategies accordingly, they are likely to find their vaunted advantages a burden, or at least a dwindling asset. Their market power and margins may erode, until they wake up in a very different kind of industry.

The Shifting Sands of Competitive Advantage

The established market leaders have gotten where they are by lowering costs through higher drop densities—more parcels delivered within a given area. They also have major assets that are hard for new entrants to copy: large central sorting facilities and, in the case of global integrators, their own fleet of aircraft. On top of that, many have created substantial advantages through operational excellence and proprietary IT support. But instead of fighting on this familiar ground, disrupters will use digitization to reduce the need for delivery density and asset intensity in the first place.
The first wave of digitization, in the 1990s and the first decade of this century, was a boon for the delivery business because it boosted e-commerce and B2C volumes. We are now entering the second wave of digitization, with cloud-based data and analytics, augmented reality, driverless technology, and modular software, and it is having a very different effect. Drawing on our extensive experience, cost simulations, and interviews with companies in the sector, we identified five possible disruptions for the next five to ten years and analyzed them in detail.

We present these disruptions not in chronological order but from the simpler and more conventional change to the more complex and radical. Each will alter the sources of competitive advantage in its own way. (See Exhibit 1.)

**THE EXPLOSION OF E-COMMERCE**

Although online-ordered parcel delivery has been growing steadily since the 1990s, consumers still rely on it for only a small fraction of total goods purchased. Even in affluent countries, e-tailers provide less than 20% of nonfood and less than 5% of food purchases, and growth rates are in the single digits. But that could change. Our research suggests that B2C e-commerce growth will accelerate over the next 20 years, resulting in a tripling of e-commerce volume. If the industry succeeds in removing all barriers to e-commerce in every category, our analysis suggests that as much as 70% of all retail spending would migrate online. (See Exhibit 2.)

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**EXHIBIT 1 | Five Potential Disruptions Are Emerging**

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<td>B2C e-commerce volume triples in the next 20 years.</td>
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<th>NETWORK 4.0</th>
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<td>2</td>
<td>Advanced analytics and connectivity greatly improve quality and reduce operating costs in collection, sorting, and line-haul.</td>
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<th>THE NEW LAST MILE</th>
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<td>3</td>
<td>Costs fall dramatically with automation and smart delivery options.</td>
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<th>THE CONSUMER IN CONTROL</th>
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<td>4</td>
<td>Consumers determine where, when, how, and who will deliver.</td>
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<th>DECONSTRUCTION OF THE VALUE CHAIN</th>
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<td>5</td>
<td>Big data analytics and online marketplaces commoditize physical handling, transport, and delivery.</td>
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*Source: BCG analysis.*
If B2C volume does indeed explode, it would change the competitive dynamics among existing parcel companies in multiple ways. First, market leaders would lose much of their drop density advantage as the scale curve becomes flatter. An example: In areas with high drop density, the leader typically has 1 parcel for every 10 households, and the number three in the market has at most 1 parcel for every 30. The leader spends less than 3 minutes per parcel, while the rival needs 4.5 minutes because of greater distances between deliveries. If volumes double, the leader gains only 15 seconds, while the rival gains 45. The scale gap narrows, making it easier for challengers to compete.

Second, this flattening of the scale curve would enable big e-tailers to make the numbers work for their own deliveries. Already, some of them are delivering in densely populated cities, and the explosion of e-commerce could extend their breakeven delivery zones into medium-size cities and suburbs. This would threaten the economics of the industry, especially for the postal companies that often dominate B2C. They need the profits from deliveries in dense areas to fund the more remote delivery areas. Moreover, since e-tailers may decide on a daily basis where to deliver themselves and where not, major operational uncertainties will arise for postal and other established parcel companies. These companies will therefore need to make their pricing and operations much more flexible to prevent e-tailers from cherry-picking their profit pools.

If they fail to do so in a timely and rigorous manner, e-tailers moving down the value chain will become a real threat. Also, regulators need to act here: in some jurisdictions, price differentiation—between cities and rural areas, for example—is not allowed; this creates the perfect playground for cherry-pickers and hurts postal companies in particular.
Third, a key question about expanding e-commerce is whether many households will start regularly buying groceries online. If this happens, and (online) food retailers deliver them through their own networks, then the current parcel market leaders’ advantages in nonfood deliveries are especially vulnerable. Nonurgent nonfood parcels can be added to these regular grocery deliveries at little marginal cost—potentially devastating the incumbents’ business. Food delivery is therefore a must-win battle for parcel companies. However, we currently see many parcel companies holding off on investments in food delivery in order to avoid operational complexity (such as refrigeration and separate distribution centers).

Finally, an explosion in e-commerce could even threaten the companies that dominate B2B. With enough volume in B2C, the largest B2C players—new or old—could use their scale to move efficiently into B2B delivery, especially in areas where B2C and B2B receivers are geographically mixed.

Up to now, e-commerce growth has been a big benefit to parcel companies. But future growth may have very different consequences. B2C parcel companies will have better chances in B2B, whereas e-tailers, B2B parcel companies, and grocery giants will have better chances in B2C. Boundaries will blur, creating a more level playing field and putting current leadership positions increasingly at risk.

**Network 4.0**

We have all heard about “Industry 4.0,” the combination of big data, connectivity, and next-generation robotics that will improve quality and reduce manufacturing costs. We foresee a similar development in collection, sorting, and line-haul, which we dub “Network 4.0.” Multiple 4.0 technologies will enter the logistics chain of parcels in the next decade. Geoanalytical optimization, debottlenecking, augmented reality, and many other tools will reduce costs and improve quality, but our analyses suggest they are unlikely to shift the competitive dynamics. There is one exception: driverless line-haul. This technology will significantly change the rules of the game.

Current line-haul economics favor a hub-and-spoke model, with parcels funneled to central locations and then out again to delivery depots. These routes are often much longer than a straight connection from the origination depot to the destination depot, because the goal is to reduce the driver’s labor cost. But what if technology can automate most of that work?

Autonomous vehicle technology has taken off so quickly that we may see driverless trucks on highways in a few years. Our simulations show that driverless technology can reduce line-haul costs by more than half. If this technology plays out as expected, labor will be much less of a factor, and logistical optimizers will find a different balance. Instead of combining as many packages as possible in a large truck to save on labor costs, parcel players may opt for smaller trucks with shorter, more point-to-point routes to save on nonlabor transport costs in the line-haul. The current cost gap per parcel per kilometer between large and small trucks may close almost entirely. (See Exhibit 3 for a numerical example.) The shift would also reduce transport times substantially, which would let companies offer customers later drop-off times for next-day delivery.
Taking this development one step further, one can imagine that networks will move toward a continuous-flow operation. Hub-and-spoke systems require a synchronized “heartbeat,” with strict cutoff times for pickup and delivery. Point-to-point networks offer the flexibility to have a more continuous flow. In our analysis shown in Exhibit 3, hub-and-spoke models currently have a total cost advantage of 20% over point-to-point, but autonomous line-hauls would turn that into a 30% cost disadvantage. Just as telephony moved from line-switched to packet-switched signals at the end of the last century, network operations will move to point-to-point, offering higher reliability, lower costs, and later drop-off times.

If driverless trucks play out as expected, parcel companies will need to go beyond rethinking investments in hubs. They’ll also face a wider network redesign, including new depot locations and sizes. They should therefore stress test their investments using different “autonomous trucking” scenarios. If they don’t, they run the risk of major write-offs within a decade or so. This is especially true for global integrators, since they depend more than other parcel companies on their existing hub-and-spoke network.

Of course, there’s nothing to stop global integrators from switching to point-to-point with multiple smaller depots, but their heavy investment in fixed assets would make it harder. Postal companies may suffer from this disruption as well if they lack the labor flexibility or the geospatial modeling expertise to make the switch. However, they tend to have a more distributed network (more spoke than hub), which would be a base for developing a more flexible “spoke to spoke” network.

Source: BCG analysis.  
Note: We assume that future line-hauls with autonomous trucks will travel only half as far as current line-hauls.
The New Last Mile

New technology may transform the collection, sorting, and line-haul operations, but it will likely have an even bigger impact on “the last mile,” which typically accounts for half of the total operational cost of delivery. Several companies are experimenting with driverless vans, aerial delivery drones, sidewalk delivery “droids,” and other innovations for the “last 100 meters.” Other possibilities being explored are special lockers in front of the receiver’s house or in a car trunk that deliverers can open electronically to minimize costly failed delivery attempts. Combining these technologies will offer the largest potential cost reduction.

Our analyses show that last-mile B2C costs could fall by more than half in high-wage countries if these new technologies deliver on their promise. Companies with the highest local drop density currently have a big advantage in these countries. But the lower the cost of last-mile delivery, the less need parcel companies have for high local drop density. The last mile is typically the most scale-sensitive part of the delivery chain, so our model predicts that as last-mile costs fall as a proportion of total costs, local market leaders will lose much of the value of having the highest drop density.

Of course, most parcel company executives are fully aware of these developments. Global integrators are conducting experiments of their own, as are some postal players. Yet many parcel companies are moving slowly, because they see the challenge as mostly technological. They assume they can be fast followers by buying plug-and-play solutions as they become available. In our view, the innovation involves much more than the technologies themselves. Parcel companies will need to work hard to fit them into their operating model, since the technologies will have vast consequences for their workforce and IT capabilities. They’ll have to develop new ways of interacting with senders as well as receivers, and over the entire journey, not just at each end. Companies betting on a fast-follower strategy might indeed be able to quickly buy the technologies off the shelf, but they will find themselves severely disadvantaged when they try to put them to actual use.

Indeed, the required investments are substantial, and many smaller parcel companies may not be able to afford them. Because of the enormous costs of developing and deploying last-mile technologies and their interfaces, the key source of competitive advantage may shift in the next decade from scale in local drop density to scale in global investment. Large e-tailers have the advantage here, since they have the resources and global scale to develop the best ways to deploy these technologies.

But global integrators will also benefit because they have much larger global scale than postal or regional deferred deliverers, which enables them to pay for investment. In many B2C markets, they currently have limited profitability owing to insufficient local drop density relative to postal players’ dominant position. Over time, delivery costs will fall for both types of companies, but they will fall more for global integrators because of their lower-density networks. Global integrators are also more likely to have the labor flexibility to realize the savings in delivery. (See Exhibit 4 for the results from a country-specific model.)
Postal companies, most of which lack the required investment scale, are therefore in great danger of losing their often-dominant local market share in B2C. They will need to find partnerships or other means to gain investment scale. New last-mile technologies may eventually trigger an international consolidation in B2C similar to what we have already seen in B2B. The industry can go from many national heroes to a few global winners.

THE CONSUMER IN CONTROL
Disruptions in parcel delivery aren’t limited to the economics of line-haul and delivery networks. Familiarity with receivers will become another source of competitive advantage. Technology combined with frequent deliveries will enable what wasn’t possible before: delivery networks that know individual consumer preferences better than the mailman does. Meeting those preferences will give delivery networks a powerful edge over rivals.

Our research shows that consumers still face multiple pain points—most notably, around the time, location, and method of delivery, as well as returns. With other industries using technology to better cater to consumers, parcel receivers are less and less willing to tolerate these pain points. They look for the same seamless experience they’re getting in banking, travel booking, and taxis.

A combination of receiver familiarity and advanced technology can create strong relationships between receivers and parcel companies. Adept companies will know from experience and outreach that person X is never at home from Monday through Thursday before 7 p.m. but is at home nearly every Friday morning. And they will know that person Y prefers to pick up parcels from the neighborhood locker on Mondays and Tuesdays but would like to pick up parcels at work on Wednesdays and to defer Thursday’s parcels to Friday. Receiver profiles can benefit
both sides: greater convenience for receivers and fewer failed deliveries for parcel companies.

Postal companies may have a first-mover advantage in receiver familiarity because they typically have the most information on receivers’ schedules, the densest retail network for enabling other contacts, and, for many receivers, the nearest return location. And the first mover may benefit from receiver stickiness: once a customer has completed a profile with one parcel company, he or she is less likely to do it for a second one.

E-tailers, however, have a head start of their own. They are already building detailed profiles of buyers through personalized interactions. They can extend those profiles to delivery, and leverage the information into a competitive delivery network. Their higher rate of first-time-right deliveries and higher overall receiver satisfaction would offset the higher prices they would charge to make up for lower delivery density. Moreover, because they typically have the first contact with the receiver, they can try to steer receivers to the delivery mode, location, and time that best suits both, resulting in higher customer satisfaction at lower costs.

Receiver centricity in B2C, however, is much more than leveraging big data and creating delivery profiles. It is also about branding, loyalty programs, and a deep understanding of consumer decision-making. Several parcel companies may claim they already do this, but compared with adept fast-moving-consumer-goods companies and large e-tailers, there is still a world to be won. To become truly receiver centric, parcel companies need to hire different talent profiles (less logistics-minded, more consumer-minded), add new key performance indicators (such as brand advocacy metrics), revamp their call centers (from cost-to-quality-mindedness), and build expertise around return on marketing investment.

With falling mail volumes and other disruptions likely to erode the current advantage of postal companies in B2C parcels, receiver centricity is an opportunity that they in particular cannot afford to miss.

**Deconstruction of the Value Chain**

Up to now, we’ve focused on e-tailers and other disrupters with strong positions in the existing parcel distribution chain. But technology is opening possibilities for a different kind of disruption altogether. The same advances driving smart logistics are also spawning “orchestrators” that efficiently combine assets and services from third-party logistics providers on a user-friendly digital platform in the cloud.

Take platforms such as Uber or Lyft as examples. They disrupted the taxi market without having physical assets. From this base, with access to cheap transportation and close relationships with receivers, some taxi platforms are now moving into the courier market, the meal delivery market, and most recently the line-haul market. These platforms combine sophisticated analytics with a user-friendly interface to connect independent drivers with items to be delivered. And, as they are already doing with ride sharing, they could even move into pooled deliveries to reduce costs there.
Now extend this thinking to parcel delivery. An orchestrator could break up the entire value chain into individual “rides” executed by third parties. This would radically deconstruct the current hub-and-spoke networks by constantly adjusting transportation activity and routes to actual volumes. E-tailers and other shippers could auction rides for collection, line-haul, and delivery. If such a system gains a dominant position, traditional parcel deliverers could devolve into commodity suppliers. Orchestrators would own the sender relationship, leaving the parcel companies few possibilities for differentiation and significantly reduced margins.

Initially, orchestrators would focus on the more price-sensitive, less time-sensitive segments because it would be hard for them to reliably deliver parcels as fast as the global integrators’ premium express service. So the global integrators would perceive their business as safe. But if orchestrators can cut delivery prices by more than half, many express customers would likely go along with a small and predictable delay. And as the orchestrators’ volumes on these deliveries start to grow, their performance will most likely improve, making them increasingly credible to the more time-sensitive segments as well. Global integrators should therefore take this threat seriously.

**Time for a Transformation?**

All five disruptions are already under way or likely to start soon. It’s unclear how fast or how far they’ll proceed. But even if only two or three reach full potential, the established parcel companies will come under intense pressure, in two ways.

First, profit margins will drop substantially because the erosion of traditional sources of competitive advantage will vastly increase competition among existing players. Second, the entry of e-tailers and orchestrators will increase the number of players among which the profit pool must be distributed, without a corresponding increase in the overall pool. So the profit pool won’t grow proportionally with expanding volumes and will need to be shared by more parties.

As a result, the sources of competitive advantage will likely shift from last-mile drop density to labor flexibility, global scale, and receiver centricity, among other changes. To remain competitive, incumbents will have to do more than adopt new technologies. They’ll have to change their mindsets and overhaul their organizations. It’s time to reinvent themselves as receiver-oriented innovators, not operationally focused delivery machines. Future profits may come from smaller, tech-oriented staffs focusing on the information infrastructure, not from large low-skilled workforces running fixed assets. (See Exhibit 5.)

That’s a tall order, since established companies are hemmed in by labor contracts and other constraints that will slow down a transformation. But it’s all the more reason to investigate and act on the situation now.

*We project more* changes in the parcel industry in the next ten years than occurred in the past four decades. Because these trends raise several strategic issues for established companies, we suggest that all executives in the industry consider two basic questions as they review their parcel strategy: How will our current
sources of competitive advantage change? And which new sources of advantage do we need to create?

The challenge now is to shift gears toward those future sources of competitive advantage. Parcel incumbents can still benefit from first-mover advantages. But the time for developing a future-proof strategy is short: they must grasp it before others will. Those who invest now can do more than just weather the disruptions; they can also discover ways to exploit the changes and emerge stronger than ever. The winners of the first wave of digitization can still win the second wave, but only if they take firm and timely action in light of the emerging rules of the new parcel game.

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<td>LOCAL SCALE</td>
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<td>COMMODITIZED</td>
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Source: BCG analysis.
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